Natural Hazard Mitigation Plan

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Section 1

Introduction

Plan Purpose

The aim of a natural hazard mitigation plan (NHMP) is to have, through both long and short-term strategies, a permanent reduction and alleviation of the loss of life, property, and injuries resulting from natural hazards. This plan is an annex in Southern Oregon University's (SOU) comprehensive Emergency Operations Plan.

There are three main reasons to write a natural hazard mitigation plan:

- By identifying and mitigating natural hazard issues now, the campus will be better prepared and impacted less when an event does occur.
- The plan forms the framework that the campus can use to collectively deal with the natural hazard issues identified specifically, and helps reduce vulnerability to future hazard events.
- With a Federal Emergency Management Agency (FEMA) approved NHMP, the campus is eligible to receive FEMA mitigation grant funding.

Mitigation Policy Background

The Disaster Mitigation Act of 2000 (DMA 2000) addresses mitigation planning and reinforces the importance of mitigation planning. It also emphasizes planning for natural hazards before they occur. As such, this Act established the Pre-Disaster Mitigation (PDM) grant program and new requirements for the national post-disaster Hazard Mitigation Grant Program (HMGP). These grant programs are only offered to entities with FEMA approved and adopted NHMPs. PDM funds mitigation projects prior to a disaster event, and the HMGP provides mitigation funding after a federally declared natural disaster.

In the early 2000s FEMA also introduced the Disaster Resistant University (DRU) program. The DRU program funded university planning efforts to create mitigation plans. In 2006, the DRU program merged with the PDM program.

If a campus has a FEMA-approved NHMP, it is eligible for both PDM and HMGP funding. These funding streams provide an opportunity for campuses to implement natural hazard mitigation projects such as seismically retrofitting high-risk campus buildings; implementing non-structural retrofits at university-owned or-operated child care facilities; and a tree maintenance program to prevent trees from becoming hazardous during wind, winter storms, or a wildfire.

Plan Development

The Oregon Partnership for Disaster Resilience (OPDR) at the University of Oregon's Community Service Center received a HMGP grant (DR-1733-HMGP-0010-P) to fund Oregon University System (OUS) Schools' natural hazard mitigation planning processes. The planning effort for the OUS campuses was organized under OPDR's new Disaster Resilient University (DRU) program area, which is based on FEMA's initial DRU program. SOU's Office of Emergency Preparedness facilitated the development of this NHMP and obtained feedback from OPDR.

OPDR provided the campus staff with print and web-based resources along with the following campus mitigation planning process resources:

- Plan Framework
- Campus Planning Process Memo
- Regional Profile and Risk Assessment

The planning process was designed to: (1) result in a plan that is DMA 2000 compliant, (2) coordinate with the state of Oregon's Natural Hazard Mitigation Plan, (3) build a campus network that can play an active role in plan implementation, and (4) build upon the Disaster Resistant University initiative. The following is a summary of major activities included in the planning process.

Phase I: Getting Started

The first quarter of our NHMP development set the foundation for this journey. Information provided by the OPDR team was reviewed to help outline our plan development and direct us to agencies/departments from which we needed to obtain additional information. The University's Director of Emergency Preparedness coordinated the development of the NHMP.

Steering Committee Formation

SOU has an existing multidisciplinary Crisis Management Team (CMT) that function as our Incident Management Team during a disaster response and assists with campus preparedness. Based on their knowledge of disasters, including the Disaster Management Cycle, they were selected to compose the NHMP Steering Committee. Two Environmental Science faculty members were also asked to initially sit on this Steering Committee. This group consisted of 15 members:

- Director of Emergency Preparedness
- Co-Directors of Campus Public Safety
- Director of Environmental Health and Safety
- Director of Information Technology

- Director of Facilities, Maintenance and Planning
- Director of Institutional Research
- Director of Marketing and Public Relations
- Chief Information Officer
- Director of Student Health and Wellness Center
- Administrative Services Coordinator – Finance and Admissions
- Director of Business Services
- Operations Director Residential Life
- Associate Provost
- Dean of Students
- Environmental Studies Professors

Additionally, an Associate Professor of Geography and Environmental Studies, and a Professor of Sociology and Environmental Studies assisted in acquiring a team of three senior year students to assist with phase 1of the NHMP process. SOUs GIS individual participated on the Steering Committee for two quarters as an ad hoc member. SOU invited the Jackson County Emergency Manager to be part of the Steering Committee but he declined.

The Steering Committee was given an overview of the NHMP process objectives in late November 2010. The first working meeting was held in early December 2010 the final working meeting was held in January 2012.

The following steps were taken to assist in writing the NHMP:

Researched Characteristics
Characteristics of SOU and the surrounding community were examined in order to set the early foundation for risk assessment and mitigation strategy development. Information was gathered from the following websites: Oregon University Systems, Disaster Resilient Universities, Oregon Department of Geology and Mineral Industry (DOGAMI) and the Ashland Forest Resiliency Program. Further information was gathered from 100 year flood plan maps for Reeder Reservoir, the Jackson County NHMP, and Southwest Oregon's Regional Profile in the State of Oregon's NHMP. DOGAMI reports were also utilized to ascertain findings from a Rapid Visual Screening study they contacted in 2005.

Interviews:
SOU conducted interviews with key campus personnel and local agencies to better understand mitigation concerns on campus. Agency interviews were conducted with Ashland Forest

Resiliency Program's, Forest Resource Specialist, Ashland Fire Department's, Firewise Community Coordinator, and the Jackson County Emergency Manager. Campus interviews were conducted with individuals from Environmental Studies professors, the Director of Institutional Research, Facilities and Maintenance personnel, Residential Life, Housing and Conference Services, and Informational Technology.

Individuals were interviewed from outside the Southern Oregon region, in order to obtain data for the NHMP. These individual included the Department of Oregon Geology and Mineral Industry, University of Oregon, the Infographics department, Oregon University Systems, and Oregon State's Hazard and Mitigation Planner.

Revised goals and action items:
With the assistance of key stakeholders the steering committee developed a list of goals and mitigation action items for this plan, see section five.

Steering Committee Involvement

The Steering Committee provided oversight to plan development, reviewed all drafts of plan and recommended the President accept the final plan. These individuals reviewed each section of the NHMP, offering suggestions and providing feedback throughout the plan development.

- December, 2010-- Steering Committee kickoff meeting
- May, 2011-- Steering Committee received findings from Firewise campus recommendations
- June, 2011-- Steering Committee meeting
- August, 2011-- Steering Committee meeting
- October, 2011--Steering Committee meeting
- January, 2012—Steering Committee meeting

Public involvement in plan development

During plan development, public participation was incorporated into the process. Involvement included:

- Feburary, 2012 --Plan posted on Emergency Preparedness website with contact information for public comment
- January, 2011-- Met with Environmental Studies Natural Hazard class and reviewed NHMP process and early plan, requested feedback/input
- January, 2011-- SOU participated in The Great Shake Out, educated on mitigation activities

- January, 2011-- Outreach material was distributed during earthquake awareness month at the earthquake seminar and NHMP was introduced
- April, 2011-- Campus community provided education around wildfire mitigation activities and NHMP

The Jackson County Emergency Manager, the Ashland Fire Department, City of Ashland Emergency Manager and Rogue Community College were also requested to review this NHMP and offer feedback or suggestions.

Section 2

Campus Profile

Introduction

The purpose of this campus profile is to provide a context for current and future Natural Hazard Mitigation Plans. This campus profile includes basic information about the campus location, population, administrative structure, critical facilities, economic generation, and our role in the community.

Southern Oregon University (SOU) located in Ashland, Oregon, functions like a small community. It is a workplace and research facility for faculty and staff, a place of learning, a home to students living in the residential halls and family housing, and a cultural hub for the city of Ashland and Jackson County.

SOU is also the public Liberal Arts University in the West. With affordability and accessibility at the top of its priority list, and with a mission that values community service and sustainable practices, SOU is a valuable asset to the local community and the state.

SOU is a crucial economic component of southern Oregon, not only by being one of the largest employers, but also by providing millions of dollars of direct spending in the local and regional community. Keeping the University open and functioning is crucial; SOU is responsible for the campus population, especially those who reside in campus housing, and it is an economic and cultural driver for the larger community. Moreover, the university can be a significant resource for the local area during a disaster event and may be called upon by the city in a large-scale emergency.

The following section describes the campus from a number of perspectives in order to help define and understand the SOU's sensitivity and resilience to natural hazards. Sensitivity factors can be defined as those university assets and characteristics that may be impacted by natural hazards, (infrastructure, economic factors, historic and cultural resources). Resilience factors can be defined as the campus's ability to manage risks and adapt to hazard event impacts (administrative structure, campus missions and directives, plans, policies, and programs). The information in this section represents the sensitivity and resilience factors for the campus at the time the plan was developed. The information documented below, along with hazard assessments located in Section 3 - Risk Assessment, should be used as the rationale for the natural hazard mitigation actions identified in Section 4 - Mission, Goals, and Action Items. The identification of actions that reduce the campus's sensitivity and increase its resilience assists in reducing overall risk.

Geography and Climate

SOU's main campus is located in Ashland, Oregon at an elevation of 2,090 feet. The campus is on a north-facing slope within the Siskiyou Mountain Range and lies15 miles north of the California border on Interstate 5, at the south end of the Rogue Valley. Mt. Ashland, at 7,500 feet high, overlooks the campus to the south, and the Cascade Mountain Range lies approximately 30 miles to the east. The region's climate is considered mild, although it does experience all four seasons. Summer months become extremely dry, with low humidity and temperatures often climbing above 100°F. The winter temperatures can drop into the twenties and teens at night. Ashland averages 18 inches of rain per year, and 10 inches of snow per year (Ashland chamber of commerce, 2011).

- The University's main campus occupies 175 acres of steep topography. SOU's second campus, known as the Higher Education Center, is a three-story, 68,700 square foot building located in downtown Medford, and 12 miles to the northwest of Ashland. Both campuses are located in Jackson County, Oregon.

- The Ashland campus is located on a fairly steep north-facing slope within the Siskiyou Mountain range. The Wildland Urban Interface (WUI), where the dense forest meets the residential population and humans intermix with wild land fuel, is located just yards from certain buildings, and within a block or two from others (See Map 1). The Medford campus is located downtown, within walking distance of numerous federal and state buildings and sits two blocks off of Interstate 5 (I-5), the major thoroughfare connecting Mexico and Canada.

- SOU's main campus is vulnerable to several potential natural hazards including:
    - **Fire**: The campus' proximity to the WUI and the recent community wild land fires puts it at particular risk in the event of a wild land fire. Due to years of fire suppression, the surrounding forest is dense and especially susceptible to fire.
    - **Flooding**: The main campus is vulnerable to flooding from excessive rainfall, snowmelt, but does not sit in a flood plain or inundation zone. Failure of the City's water supply, Reeder Reservoir's Hosler Dam will lead to flooding of downtown Ashland and isolate access to and from the campus. Because of the proximity of the dam to Ashland, and the relatively short evacuation notice, the Federal Energy Regulatory Commission (FERC) required the city to install an audible emergency alarm system. Although the campus is not in the flood plain, when local flooding does occur, northbound interstate access is compromised, potentially stranding students and staff on campus. In addition, the city water treatment plant resides in the flood plain, increasing the risk of water contamination.
    - **Volcanic Eruption**: The University is approximately 90 miles northwest of Mount Shasta, a 14,162 feet composite volcano of the Cascade Mountain Range.

- **Earthquakes**: SOU is located on the Cascade Subduction Zone (CSZ), the 600 mile-long fault line where two of the Earth's tectonic plates collide. Here the Juan de Fuca Plate and the North American plate converge at the rate of 1-2 inches per year (3-4 cm/yr), causing stress to accumulate on the fault that extends from Northern California to Vancouver Island. The effects of a great (approx. magnitude 9.0) CSZ earthquake would reach far inland. Ground shaking, landslides, liquefaction, fires, hazardous material spills, and building damage are some of the hazards faced from a CSZ earthquake. Additionally, SOU is at risk for crustal earthquakes, and USGS data shows small quakes occurring in this region. The region has not experienced a large earthquake for 300 years, but the most recent forecast from the U.S. Geological Survey puts the likelihood of a massive quake at 40% in the next 50 years (www.usgs.gov).

Campus Population

Any natural hazard mitigation activity for the University must take into account the size and distribution of the campus community. Given the nature of the University, the campus community is a dynamic body, composed of students, faculty, staff and visitors of all ages. Effective risk reduction must be tailored to its population, for there is no one-size-fits-all mitigation strategy. On a daily basis, both of SOU's campuses draw students, faculty, and staff from four different counties in Oregon, including Jackson, Josephine, Douglas, and Klamath, as well as Siskiyou County in California. Hundreds of people drive 60-plus miles to attend classes and/or work at the University; frequently crossing mountain passes to attend class.

Students

During Fall, Winter and Spring terms of the 2010-11 academic year SOU's enrollment averaged over 6000 students, in the Fall 2011 there was a 5% increase in students over Fall 2010. The summer term population is approximately 2,000 students. Roughly 30% of the university's students are new each year and 87% are undergraduates. Traditional college-aged students (17-25 years) make up 68% of the overall population. The majority of students (70%) attend full time. Hispanic enrollment rose 46% in the fall of 2010, raising minority student enrollment to 13%. Oregon residents make up 75% of the student body, with 25% hailing from outside the state. Of the non-residents, approximately 2% are international students from Asia, Europe, Australia, Latin America, the Middle East, and Africa. Lacking a local support system, and possibly unaware of potential natural hazards in the region, non-resident students are particularly dependent on the campus.

Faculty and Staff

The University employs 325 faculty members and 386 staff and administrators. In addition, SOU participates in the federal Work Study Program and has hundreds of students working throughout the campus.

Satellite Campus
SOU houses an Oregon Health and Sciences University School (OHSU) of Nursing satellite program on the Ashland campus. OHSU has 30 employees and 165 students at SOU.

Visitors
Visitors are an integral part of the University community. For admissions events alone, SOU welcomes about 4,100 people to Preview Day, Raider Registration, and campus tours. The university also serves the area's older population, hosting 1,300 seniors participating in life-long learning programs held on both the Ashland and Medford campuses. The university Athletic Department welcomes thousands of visitors each year. For the 2009-2010 school year, SOU sports programs brought approximately 30,000 attendees to the campus. The Stevenson Union draws 7,000 visitors a year to the campus. The university brings in over 3,000 visitors for the annual graduation ceremony. In the summer months, 500 elementary-through high school-aged students participate in the SOU summer Kid's U class programs.

Many visitors come to the University to celebrate the wide range of cultural offerings available. Hosting workshops, film events, lectures/book talks, music events, and art receptions and exhibits, the Hannon Library welcomed 4,492 visitors during the 2009-2010 school year. The Music Department brings in approximately 4,000 visitors a year, presenting concerts performed by University students as well as hosting numerous outside groups including the Rogue Valley Symphony, the Youth Symphony of Southern Oregon, and Chamber Music. The SOU Theatre Department welcomes roughly 5,500 visitors annually. Ashland is home to the world renowned Oregon Shakespeare Festival; SOU provides dormitories for visiting groups to use while attending these plays nine months out of the year. In addition, the University's College and Arts and Sciences holds a Friday Science Seminar Series and brings in between 300-500 visitors a year.

Campus Occupancy
To effectively reduce risk from natural hazards, those areas on campus most populated during the day must be determined. Knowing which buildings on campus have the greatest number of people in them and whether the occupants are students or faculty/staff allows for mitigation activities that can be specifically targeted to those buildings.

Daytime Population
The student population is the most dynamic on campus because the location of students changes throughout the day. Class enrollment peaks between 10:00 am and 2:00 pm. The busiest buildings are Taylor, Science, Education/Psychology and Central. SOU also has two childcare centers on the Ashland campus. The Schneider Children's Center cares for children six weeks to five years of age; they have 58 children enrolled. The SOU Pre-school is open to the campus and community for children aged three to five years; they have 22 children in attendance. Osher Lifelong Learning Institute (OLLI) at SOU offers non-credit courses by volunteer instructors on both the Medford and Ashland campus to 1250 adults of all ages during the months of September through June.

Overnight Population

A total of 970 students live on campus in four complexes consisting of 16 residence halls. Of the halls, 12 are used for students, three are used for conference guests, and one is used for the students from Saint Mary's High School Chinese exchange student program. The Cascade complex houses the largest number of students at 637 freshmen, 145 sophomores, 86 juniors, 65 seniors, 37 graduate students, and 34 post-baccalaureate students. In addition, there are 24 Chinese high school students living on SOU's campus and attending a yearlong Confucius classroom at a local high school. The Cascade complex houses the largest number of students with over 500.

Students living in University Family Housing total 239, many of which have families residing with them. Of that number, 14 are graduate students and 195 are undergraduates. An additional 30 residents are post-baccalaureates, non-admitted, RCC students, and nursing students. Approximately 4,800 students live off-campus, in non-University student housing. While the University is not directly responsible for those students living off-campus, the impact of any natural hazard on these people should be considered.

During summer term SOU hosts summer camps and conferences, bringing an additional 8,000 people to stay in the Residence Halls, many of these visitors are minors.

Liberal Arts

Resembling a private liberal arts college, while being both accessible and affordable, SOU is considered" the public liberal arts University of the West," with an inclusive campus community dedicated to student success, intellectual growth, and responsible global citizenship. It offers a broad curriculum while still primarily focusing on undergraduate education and challenging academic programs centered on student learning and civic engagement. SOU students have the opportunity to participate in the community and conduct undergraduate research addressing regional needs with the guidance of professors.

Research Enterprise

While SOU is a teaching institution primarily focusing on undergraduate education, many of the faculty is engaged in significant research.

- Approximately 80% of University grant dollars received are devoted to research.
- The majority of grant funding is awarded to faculty in the Departments of Environmental Studies, Biology, and Social Science Policy and Culture to assist research both on campus and out in the field (locally and regionally).
- Arts and Sciences received a total of $2,004,042 in research grants for FY'08 through November of 2010.

- Grant dollars typically are received from the Bureau of Land Management, the National Science Foundation, the Environmental Protection Agency, the United States Department of Education, the Oregon Department of Transportation, regional Native American Indian Tribes, and a few other local agencies.

- The programs in the Science Building generate the most research grant dollars. The University is particularly excited about the National Science Foundation's recent research grant of nearly $500,000, which was used to purchase a stable isotope mass spectrometer. The spectrometer will be utilized to research animal migration patterns, forensic geo-location, and to formulate a paleo-perspective on climate change.

Economic Productivity

- SOU ranks among the top ten largest employers in Jackson County.

- The faculty and staff, as well as current students and University graduates, play a vital role in economic generation, both locally and throughout the state**.**

- The University's total operational budget is $66,836,194, with $57,485,753 allotted for staff, faculty, and student salaries.

- The University spends approximately $23,000,000 per year on outside contracts**.**

- SOU works with over 3,000 vendors, the majority of them are from the Southern Oregon region.

Additionally, the University is home to Rogue Valley Television (RVTV) and Jefferson Public Radio (JPR). Parts of these organizations expenditures are in their respective foundations, and are therefore not included in the University's budget. Both entities play a critical role in informing and educating the public, especially during a disaster. RVTV provides public access to education and media arts, as well as local government programming, throughout Southern Oregon. JPR is a regional public radio service reaching over one million potential listeners in a 60,000-square-mile area covering Southern Oregon and Northern California. Operating via the largest translator network in public radio, JPR plays a critical role in keeping the public informed and is a vital resource for the university and the local region. RVTV is housed in its own building, while JPR is housed in the basement of Central Hall.

Organizational Structure

For successful natural hazards mitigation and planning to occur, the entire campus must be considered in the process. However, there are some departments and offices within the University that must be more closely involved in the NHMP process. These organizational units provide the infrastructure and resources necessary to facilitate a safe and efficient response in the event of a natural hazard occurrence. These departments report to the Vice President for Finance and Administration, The Provost, and the Vice President of Student Affairs, each of these individuals then report to the University President. This section provides brief descriptions of the

departments that are most likely to be involved in mitigation work. See Appendix A for SOU's organizational chart**.**

Facilities Maintenance and Planning

The Facilities Department maintains the infrastructure of the University, including power, water, sewer, and both structural and non-structural aspects of all buildings on campus. This infrastructure is critical to the continuity of University functions and services. Ensuring that the various components of this infrastructure are reinforced and supported in the event of a natural hazard is an important role for the facilities office. Additionally, the department oversees building control (keys, access, security systems). The Facilities Department also maintains the campus grounds and will play a crucial role in debris management in the event of a windstorm, severe winter weather, or an earthquake. The landscape crew will provide valuable information regarding fuel reduction and low flammability landscape options. Additionally, the Facilities Department can play an active role in helping departments retrofit their offices for earthquake mitigation as taking such actions as securing bookcases to the walls.

Environmental Health and Safety (EHS)

This department is responsible for ensuring the safety of employees, students, and visitors by assisting the University community in creating a safe and healthy campus environment. EHS has many activities that go hand-in-hand with natural hazard mitigation efforts. For example, EHS evaluates the University for its compliance with health, safety and environmental standards, codes, and regulations. It also works with individual departments to identify potential health, safety, and environmental hazards. EHS expertise will be valuable in securing chemicals and hazardous materials during an earthquake.

Public Safety

Campus Public Safety (CPS) is responsible for overall University safety, crime reporting, campus patrols, and the investigation of suspicious activities on campus, safety escorts, emergency response, and parking supervision for the University. CPS also maintains the Emergency Operations Plan, a plan that guides the University during disaster response. Because hazard mitigation and emergency response are so closely related, CPS has played a key role in the development of this plan and will to play a significant role in its implementation. CPS will be crucial in the development of strategies in natural hazard mitigation. The department's expertise and experience can provide valuable insight into the vulnerabilities and weaknesses that the University faces in an emergency.

Planning and Sustainability

The Planning Office manages the creation of spaces that support and enhance teaching, research, and public service activities at the University. This office assists in planning the growth and development of the campus; it works with facilities to oversee construction of all capital projects, as well as managing energy projects. This office can help to integrate this NHMP into both building remodels and future building projects. As leaders in campus sustainability, this department can offer recommendations about mitigation and sustainable solutions.

University Housing

The University offers both on-and-off-campus housing to its students. University housing presents a challenge to risk reduction efforts because the role of providing a home to students includes many diverse elements: shelter, safety, food, and utilities. All of these elements must be considered in the mitigation strategy. In addition, family housing has an onsite child care facility, caring for children from infancy to kindergarten who must be considered. SOU also houses 24 Chinese high school students in the residence halls who are in a yearlong Confucius classroom program at a local high school. Housing also oversees the summer camps and conference programs, during which individuals stay in the residence halls.

Information Technology

Information Technology is responsible for providing network and Internet services and the information and communications systems for the University. Phone, email, web presence, and network and Internet access are the critical communication and information services utilized by SOU. In the event of a natural disaster, these services will be necessary in a response effort. Ensuring that they are protected from natural hazards with redundant backups is a mitigation activity, which is in its infancy.

Student Health and Wellness Center (SHWC)

The mission of the SHWC is to "To promote the optimal health and well being of students through quality education, primary medical care, and mental health services." The SHWC provides a wide range of medical and behavioral health services for the student population. There are 3 full time medical clinicians, 2-3 RNs and 3-4 counselors on site who see approximately 100 students a day.

Auxiliary Departments

Auxiliaries are entirely self-supporting services that are essential to the University mission; these include University Housing, the Student Health and Wellness Center, the Stevenson Student Union, Athletics, Parking, and the bookstore. The distinguishing feature is that an auxiliary department supports itself through revenue generated by fees for service. They do not receive any general fund support, and capital construction projects for auxiliaries are funded through F-bonds instead of G-bonds. (F-bonds are sold by auxiliaries with revenue from the funded project intended to repay the principal and interest. G-bonds are used to fund capital construction projects with state funds repaying the bonds.)

Built Environment

SOU officially opened in 1926 and was headquartered in Churchill Hall. The University's main campus has expanded across 175 acres to include 14 academic buildings, 16 residence halls, and other multi-use facilities, including family housing, two daycare centers, an athletic center and stadium, the Student Health and Wellness Center, the Student Union, the Schneider Museum of Art, the Hannon Library, and the Center for the Visual Arts. Infrastructure on campus totals 1.4

million square feet of building space, which has been built over the course of 80 years. The Higher Education Center in Medford was completed in the fall of 2008 and is a 68,700 square foot, three-story building. Each structure varies in building standards, alarm systems, and seismic resistance, depending upon the year it was built and the materials that were used.

Risk to campus infrastructure comes mainly from earthquakes, wild land fires, ice/snow, and windstorms. Retrofitting buildings on campus is both costly and time consuming, but it is also important in order to ensure that the campus community remains as safe as possible in the event of a natural disaster. An important step in the natural hazard mitigation planning phase is determining which buildings on campus have the highest priority need for further seismic evaluation, based on building characteristics, occupancy, use, materials housed, building function and historical or cultural significance and the value of both the structure and contents.

Building Structure Class

The majority of buildings on campus have concrete frames; a few have reinforced masonry with flexible floor framing, and a small percentage is wood- framed (www.isopropertyresources.com), see Map 2. The Higher Education Center (HEC) in Medford is a LEED Platinum (green building) certified structure and was built meeting new seismic requirements.

Building Structure Value

Map 2, Building Replacement Costs Data, illustrates the value of each building in 2005. This data is based on the Oregon Department of Administrative Services 2010 data for all State owned buildings in Southern Oregon. The most valuable structures on campus (with a replacement value of more than $16 million) include the Cascade Complex, Hannon Library, Science Hall, and McNeal Pavilion.

Insured Building Content and Value

In addition to the structural value of buildings on campus, the contents value of some SOU buildings is also a consideration in natural hazard mitigation. Items included in this value are the special collection University archives; the art exhibits on display in the Hannon Library and the Schneider Museum of Art, valuable research equipment, and other insured physical property such as computers, desks, and other classroom equipment in buildings owned by the University. In addition, the OHSU School of Nursing's simulation lab resides in Britt and has a replacement value of $500,000. RVTV's replacement value is approximately $1,000,000. These values does not account for personal belongings of residence hall occupants or faculty possessions.

Historic and Cultural Sites

Historic and cultural sites on campus are valuable resources to the University and the community. A challenge in natural hazard mitigation is maintaining the sites' historical and cultural integrity while taking the appropriate measures to keep them safe for the campus staff, students, and community.

The historical buildings on campus include the original University headquarters, Churchill Hall, built in 1925, and the Plunkett Center, a historical private residence acquired by the University in 1966 and listed on the National Register of Historic Places. Churchill is now primarily used for administrative offices and classrooms. The Plunkett Center consists of offices; a University call center; and a small, permanent art collection.

Important cultural sites on campus include the Schneider Museum, which houses an array of exhibits that change quarterly, and the Hannon Library, which houses a permanent collection that includes over 500 unique and diverse pieces.

The Hannon Library is central to the University and to the larger region. It provides a number of resources and services to students, faculty, and community members. The general collection includes over 310,000 volumes; nearly 10,000 maps; and over 9,000 electronic resources, videos and audio recordings. Hannon Library's secure climate-controlled Special Collections/University Archives contains materials of significant historical and research value that are too rare, valuable, or fragile to place on the open stacks. Located here are the most valuable Shakespeare-related publications from the 8,000 volume Margery Bailey Collection including Shakespeare's second and fourth folios from 1632 and 1685 and the sixteenth century histories that Shakespeare may have referred to while writing his historical plays. Other collections include manuscripts, photographs, historical maps, the Ferte Collection of first-edition Northwest poetry, a viticulture collection, and local history materials. Permanent records relating to the history of SOU from its earliest days are maintained here also.

Buildings with Hazardous Materials

Hazardous materials can pose a serious threat to health and safety in the event of a natural disaster. Seismic activity can destroy the infrastructure that houses dangerous chemicals, causing spills. Hazardous material levels can be divided into three categories: (1) Low risk, meaning very few chemicals such as cleaning supplies; (2) Medium risk, meaning a moderate amount of chemicals such as those in an art studio; and (3) High risk, meaning very toxic chemicals usually found in science buildings.

Infrastructure

In addition to the built environment, the University's underlying infrastructure is important when developing a natural hazard mitigation strategy. Infrastructure refers to the basic facilities, services, and installations needed for the functioning of a campus. SOU's infrastructure is composed of heat, water, power, data and communication lines, and storm and wastewater services.

Utility Sources and Uses

The Campus Heat Plant provides the campus's only source of steam, chilled water, and compressed air. The City of Ashland provides SOU with electricity, domestic water, and sanitary sewer services, table 2.1. Distribution of most utilities throughout campus is confined to an underground system of concrete tunnels and buried pipes. The tunnel system works as an

interconnected network. If one portion of the network is damaged in the event of a natural disaster, the entire system is compromised, and the university's ability to deal with the disaster is also greatly decreased. The following section provides an overview of the infrastructure that serves SOU.

Table 2.1 Campus Utility Sources

Utility	Source	Distribution to Campus	Concerns or Issues
Electricity	City of Ashland	Primarily two main transformers	Supply is only as good as the ability of the city to distribute & is susceptible to earthquakes, wildfires, and severe weather. Inadequate number of generators on campus.
Steam	Campus Central Heating Plant	Tunnel system	Tunnel system is susceptible seismic events & collapse.
Chilled water	Campus Central Heating Plant	Tunnel system	Tunnel system is susceptible to seismic events & collapse.
Network and communications systems, telephones	Computing Services Data Center	Wiring runs through Tunnel system and a minimal amount on overhead poles	No redundant paths for fiber and copper. However, there are surplus strands.
Communications circuits, Internet services	Qwest, Core Digital/Hunter Communications, Nero, LS Networks, Charter Communications	Head end for these vendor connections is either in the Computing Services Data Center Communications Room 112 or the Library Building In Medford, connections come into the Data Center on the main floor	No redundant paths from Core Digital connecting Medford & Ashland
Life and Safety Security Lines (call boxes)	In house	Tunnel system	Tunnel system is susceptible to seismic events & collapse. Call boxes susceptible to wildfire.
Heat	Campus Central Heating Plant & AVISTA Natural Gas	Tunnel System via boilers	Loss of Natural gas from AVISTA and /or electricity. Tunnel system is susceptible to seismic events & collapse.
Compressed air	Campus Central Heating Plant	Tunnel system	Tunnel system is susceptible to seismic events & collapse.
Domestic water	City of Ashland	City main water lines (buried pipes)	Water treatment plant resides in flood plain Buried pipes are susceptible to freezing, flooding & seismic events.

Sanitary sewer	City of Ashland	City Main Sewer Lines (buried pipes)	Water treatment plant resides in flood plain Buried pipes are susceptible to freezing, flooding, & seismic events.
Storm water system	City of Ashland	Buried pipes	Buried pipes are susceptible to freezing, flooding & seismic events. If pipes become clogged, there is a possibility of overflow and back flow.
Backup generators	Computing Services Center West, Marion Ady, Central Heat Plant and Stevenson Union	Building envelope	Susceptible to wildfires & seismic events. All but Heat Plant are for egress only, designed to run less than two hours.

Electricity

SOU relies on the City of Ashland to provide electricity to power the campus. In the event of a disaster that would impair the City of Ashland's ability to supply the campus with electricity, University functions would be greatly compromised. The only long running generator resides in the Heat Plant. It would not produce electricity for the campus. Without electricity building fans would be inoperable and no heat would be distributed. SOU still has some overhead electrical lines bringing power to campus from the city's power source.

Water

Certain buildings on campus are more reliant on water than others. Buildings that house students use water for cooking and sanitary services 24 hours a day. Science buildings depend on water for lab research. The Student Health and Wellness Center relies on water to care for patients, perform laboratory tests, and clean equipment. During a disaster, lack of domestic water may hinder emergency efforts and could also lead to a public health emergency. Concerns regarding water in the event of a disaster include:

- Contamination of the City of Ashland's water supply due to the proximity of the water treatment plant to the flood plain.
- Inability to distribute potable water.
- Campus steam production hindrance resulting in loss of heat.
- Failure of sanitary sewer systems.

Steam

The majority of buildings on campus are reliant on steam production, via natural gas, for heat in the winter months. If SOU does not have access to natural gas, the boilers can be operated on diesel. If at any time electricity is lost, buildings will not be heated due to fans inability to run and distribute heat.

Communication and Information Systems
Network infrastructure (wiring, routing, and switching), telecommunications, and Internet connectivity are vital to ensure communication on a local, regional and statewide level. Access to data housed in student, employee and financial systems may be critical in the event of a natural disaster and is essential to the ongoing operations of the University.

SOU depends on outside vendors for connections to the Internet and the administrative system, Banner, is hosted off site in Corvallis Oregon. These vendors include Core Digital/Hunter Communications and Nero (the OUS network run out of the University of Oregon). Internet connectivity for the Medford Higher Education Center is contracted through Charter Communications and supported by Rogue Community College (RCC) Information Technology personnel.

The SOU Ashland campus depends on internal building low voltage wiring and external fiber cabling installed in the campus tunnel system connecting the campus network infrastructure. Low voltage- certified SOU Information Technology personnel manage this infrastructure. Medford Higher Education Center has a similar infrastructure except that the City of Medford and Charter Communications manage the external cable plant.

Distribution
Utilities are primarily distributed across campus through the underground tunnel system and buried pipes. The tunnel system distributes compressed air, chilled water, communication lines and steam. Tunnel damage during an extreme freeze or from seismic activity could result in the inability to distribute important utilities that the campus relies on to function. It is impossible to predict how the tunnels will withstand a seismic event. Ashland is considered a high seismicity region according to FEMA's Rapid Visual Screening.

Critical Facilities
Critical facilities are defined as infrastructure that house services which would directly impact public health and safety if function was impaired in the event of a disaster. They can also play a crucial role in recovering from and reducing risk in the event of an emergency. These critical facilities include the SHWC, the Computing Center, the Cascade Complex, the Heat Plant, and the Residence Halls, see Map 3.

Health Center
The SHWC provides medical and behavioral health services to SOU students. The Health Center will be used in the event of a natural disaster to house ill or injured patients. The area outside the front entrance of the Health Center can also be used as a triage station to prioritize patients and provide care. SHWC agreed to act as an alternate care site for the city of Ashland in the case of a large disaster event, which overwhelmed the hospitals, or in instances where access to the hospitals was affected. Network and Power redundancies for SHWC will also be necessary for successful mitigation.

Computing Centers

Ashland

There is one facility that is critical for data and voice communications for the Ashland campus, the Computing Services Center West. This building also houses the campus Emergency Operations Center. SOU computing, Internet -based communications, and telephone communications would be significantly disabled if this building becomes inoperable. The SOU Data Center is the hub for virtually all of SOU's copper and fiber optic cable as well as electronic hardware. The Data Center connects all campus buildings to each other, and houses the Public Switched Telephone Network (PSTN) and the critical Internet network infrastructure. All connections with outside networks such as NERO, AT&T, Qwest, and Core Digital originate in this facility.

On the Ashland campus the Computing Center is the location for most servers for SOU's enterprise database and network services, including: web services, network management and IP address distribution systems, various departmental database servers, network storage, printing etc. Additionally, most of the people who keep these services functioning are housed in this building.

This building has one generator, which is sized to run the Data Center and provide power and lighting only to one room, which is the designated Emergency Operations Center at the University. All critical equipment except the telephone switch is also connected to Universal Power Supplied (UPS).

There is currently no warm or hot site established for the Ashland Data Center. A cold site with available rack space has been provisioned in the Medford Higher Education Center Data Center.

Hannon Library

The library contains a small data center for its systems, but does not have a generator or redundant pathways for library services.

Medford

There is one facility that is critical for data and voice communications for the Medford campus, the Higher Education Center (HEC). At the HEC, the Data Center is located on the main entry floor and is similarly the hub for all connectivity within the building. The HEC also is the Data Center for all of Rogue Community College's buildings in downtown Medford. The HEC Data Center has a generator and UPS for all critical equipment.

5th Site

SOU's core administrative systems including Banner Student, Finance, HR, and the Payroll system and associated data warehouses are hosted by the OUS 5th Site on the Oregon State University campus in Corvallis. A warm site has been established for the 5th Site operations at the Eastern Oregon University Data Center.

Central Heating Plant

The Central Heating Plant provides the sole source of heat, hot and cold water, and compressed air for the SOU campus. If this critical facility were damaged in the event of a natural disaster,

the ability for the campus to function would be greatly impaired. Other critical facilities may not be able to function at their optimum in the absence of heat, hot or cold water, and compressed air.

Residence Halls

At any given time, SOU has over 1,000 students and visitors residing in the Residence Halls. SOU is responsible for providing shelter and care resources for these individuals. If these individuals had to relocate to Red Cross Shelters, they would fill up half of the city's shelters. SOU may also be asked to provide sheltering for the city of Ashland if we had open Residence Halls at the time of a disaster.

Cascade Complex

The Cascade Complex is home to the main on-campus dining service that serves campus residents. These dining and cooking facilities would be utilized in the event of a disaster to provide food and beverages for any persons housed on campus. SOU might also be asked to provide food to the city's Emergency Management Team and emergency personnel.

Existing Plan and Policies

Campuses often have existing plans and policies that guide and influence their growth. Such existing plans and policies can include a Campus Master Plan, a Capital Improvement Plan, design standards, and technical reports or studies. Plans and policies already in existence have support from the campus community, many campus plans get updated regularly and can adapt easily to changing conditions and needs.

SOU NHMP includes a range of recommended action items that, when implemented, will reduce the campus's vulnerability to natural hazards. Many of these recommendations are consistent with the goals and objectives of the campus's existing plans and policies. Linking existing plans and policies to NHMP helps identify what resources already exist that can be used to implement the action items identified in the plan. Implementing the NHMP's action items through existing plans and policies increases their likelihood of being supported, being updated, and maximizes the campus's resources.

Table 2.2 Existing Plans and Policies

Name	Date of Last Revision	Author/ Owner	Description	Relation to Natural Hazard Mitigation
Campus Master Plan 2010-2020	2010		The Campus Master Plan provides a framework for future development and policies.	Natural hazard mitigation should be incorporated into the long-term Campus Master Plans.
All Hazards Emergency Operations Plan	2011	Campus Public Safety	Provides guidance for campus response during disasters or emergency events.	Mitigation is a large component of the Disaster cycle: Mitigation, Preparedness, Response & Recovery

Low Voltage Wiring Specifications			Establishes requirements for design of current & future communications wiring facilities in campus buildings.	Documents from various building construction bids should be consolidated and upgraded to include hazard-resistant construction and maintenance methods
Safety and Security Policy			Establishes policies for the overall safety and security of campus including inspections, etc.	Put in place violence prevention plan that would mitigate potential safety and security issues and damages. Promote building safety through nonstructural improvements.

Section 3

Risk Assessment

Introduction and Methodology

As exemplified in the Campus Profile, Southern Oregon University (SOU) is designed to function as a complex, interrelated network of built structures and social systems. Disaster events often highlight the weaknesses of these systems. By proactively looking at campus risks from a comprehensive perspective, it is easier to understand and identify the campus resources that are most vulnerable to certain natural hazard events. This type of assessment strengthens the networks that allow the university to operate and aids in prioritizing mitigation efforts, which allow the university to become more resilient by avoiding catastrophic losses.

The purpose of this risk assessment is to identify and characterize the natural hazards that could impact SOU and assess the risks these natural hazards pose to the SOU campus. The risk assessment provides a snapshot of the University's vulnerability relative to the hazards to which the campus is susceptible.

Combining the information from the natural hazard profile with the inventory of campus characteristics, aids in identifying areas of particular vulnerability. With this information, the University can identify "action items" or specific projects and activities that will reduce potential losses, and protect the integrity of the University.

Discussion of the University's three greatest hazards includes three elements: vulnerability assessment, hazard identification and profile, and risk analysis/loss estimation.

1. Hazard Identification & Profile

Based on our Hazard Vulnerability Assessment (HVA) Appendix B, SOU has identified the top three natural major hazards that threaten the campus: **earthquakes, wildland fires, and severe weather (specifically wind and winter storms)**. This section explores the steps taken to identify these hazards; describes the causes and characteristics of each hazard; documents how they have historically affected the university and surrounding community; and also examines the geographic extent, intensity, and probability of their occurrence.

In order to establish a history of natural hazard events affecting SOU and the surrounding community, interviews were conducted with long-term employees, the campus Crisis Management Team (SOU's Incident Management Team), and employees of critical facilities and services. The purpose of these interviews was to identify specific mitigation needs, challenges (both historical and anticipated), and areas of concern surrounding mitigation of natural disasters and to assess levels of preparedness and mitigation efforts among these areas.

Additionally, SOU consulted the State of Oregon Natural Mitigation Plan (Southwest Regional Profile), Jackson County's Mitigation Plan, and the City of Ashland Community Wild Fire

Protection Plan. SOU also utilized the Jackson County Hazard Analysis Matrix (2008) and the Region 5 Hospital Preparedness Hazard Vulnerability Analysis (2009).

Lastly, a campus wide Firewise assessment was completed with Ashland Fire and Rescue's Fire Chief and their Firewise Communities Coordinator. This National Fire Protection Associations (NFPA) Firewise community assessment helped identify mitigation actions the University can take to help protect life and property from wildfire.

The University has development plans beginning for a new Residence Hall there are no other plans for future land development of University property.

2. Vulnerability Assessment

This section analyzes the vulnerability of the University by identifying assets that could potentially be exposed to a hazard. Critical facilities are of particular concern because they provide services that are necessary to protect the campus community and are needed to fulfill important public safety, emergency response, and/or disaster recovery functions.

The following specific activities compose this part of the risk assessment: (1) identification and mapping of risk and asset attributes on campus, (2) analysis of the resilience of structures on campus, (3) interviews with longtime university employees, and (4) a compilation of input from the NHMP steering committee members.

In order to estimate potential dollar losses for vulnerable structures and equipment, information was obtained form Oregon University Systems 2010-2011 Risk Assessment Building Replacement Values. Additionally individual departments were asked to supply values for large equipment or collectibles.

Identification and Mapping of Risk and Asset Attributes

In 2007, a digital map of every building footprint on the SOU campus was created from aerial photography. This became the base map of the campus that was entered into the ARCGIS database, where descriptive attributes could be applied. In January 2009, Facilities Management and Planning began collecting and collating information layers of the campus infrastructure. The purpose was to locate water, sewer, storm drain, gas, and electrical utilities for mitigation planning. Because a campus evolves over decades, there were many sources of information scattered throughout Facilities, Housing and Administration as well as the City of Ashland.

Creating a comprehensive database of campus building information that incorporated the potential impacts of natural disasters became the focus in 2010. Three specific areas were focused upon to create this matrix: (1) building attributes, (2) peak occupancy by day and time, and (3) environmental factors that could influence the event.

Building attributes were listed and categorized as either risk or asset. Risk values relate to the building's ability to withstand natural disasters; the asset attribute represents a quantifiable campus resource that may be linked to a building.

Campus building data and/or maps exist for the following attributes, collectively, this list constitutes the "Design Level Risks".

Risk attributes**:**

- Structure type – construction class, building materials, fire resistance
- Construction data – reflects building code era
- Fire sprinklers–fully, partial or none
- Roof material–level of fire resistance
- Square footage by room, floor, and total
- Location of utility main lines (gas, water, electricity, sewer, storm drains)

Asset attributes:

- Student, staff and faculty occupancy (hour/day)
- Building replacement value
- Content replacement value
- Hazardous materials – known bulk chemical storage locations
- Critical Facilities–i.e., facilities building, heat plant, health center, computer sciences, residence halls.

Additionally, Facilities Management and Planning created a series of maps that can be uploaded into the University's GIS program of the campus, utilities, and buildings. A combination of the two preceding lists creates the Design Level Risks, which informs everyone from planners to emergency responders the university's mitigation needs to how and where to deploy materials and supplies.

3. Risk Analysis/Estimating Potential Losses

This part of the risk assessment involves estimating the likely damage, injuries, and potential financial loss in the event of a natural disaster on the campus over a given period. Information is provided for estimates for SOU's top three identified natural hazards from the HVA.

Earthquake

Location of Natural Hazard

The United States Geological Survey designates the state of Oregon as a "Very High Seismic Hazard". The SOU campus is located in seismic zone 3, indicating a moderate to high earthquake threat. Zone 3 encompasses Portland, Eugene, and all other major and minor metropolitan areas along Interstate 5. The SOU campus is also close in proximity to the western

edge of seismic zone 4, which encompasses Curry and Coos Counties and is designated as a high seismic risk area. (Oregon Department of Land Conservation and Development, 2000)

Extent of Natural Hazard

The University's geographic position makes it susceptible to earthquakes from four sources: the off-shore Cascadia Fault Zone; deep, intra-plate events within the subducting Juan de Fuca plate; shallow crustal events within the North American Plate; and earthquakes associated with renewed volcanic activity. All are related to the subduction of the dense, oceanic Juan de Fuca Plate under the light, continental North American Plate (Southwest Oregon NHMP, 2009).

Unlike flooding or wildfires, which may be more campus geographically specific, an earthquake would extend across the entire campus.

Previous Occurrences of Natural Hazard

Many geologic studies show that Oregon has an expansive history of significant seismic activity. Scientific evidence, including liquefaction features and carbon and tree ring dating, as well as historical records from Japanese and Native American legends, indicate that what is now commonly accepted as an M9 earthquake occurred in January of 1700. Further research on coastal wetland sediment deposits indicate that over the past 6700 years the Cascadia Subduction Zone has produced 12 major earthquakes ranging from M7-9.0 (Witter, Kelsey, and Hemphill-Haley, 2003). The average occurrence interval is between 570-590 years. These intervals between earthquakes have varied from 300 to more than 1,000 years (Goldfinger, Nelson and Johnson, 2003).

According to the Oregon Department of Geology and Mineral Industry (DOGAMI), between 1878 and 2001, ten major earthquakes ranging from M4.8 to M7.1 affected the state of Oregon, and more than 14,000 additional smaller earthquakes have been recorded. For example, the February 28, 2001, earthquake in Washington state was a deep intra plate earthquake that produced a rolling motion felt from Vancouver, B.C. to Coos Bay, Oregon and as far east as Salt Lake City, Utah. In 1965, a similar M6.5 intra plate earthquake centered south of the Seattle-Tacoma International Airport caused seven deaths (Hill, 2002). Oregon's largest earthquakes occurred in September 1993 and had magnitudes of 5.9 and 6.0. Both earthquakes were from crustal faults and were located in Klamath Falls, Oregon, which is only sixty miles east of the SOU campus. According to a DOGAMI report on "Selected Earthquakes for Oregon 1841-2002" by Niewendrop and Neuhaus, many other significant earthquakes have affected Oregon and the Northwest Region. Some of the largest are described in Table 3.1.

Although SOU has felt tremors and aftershocks from earthquakes that have occurred in and around the area over the past 100 years, it has not sustained any significant damage.

Table 3.1: Local Earthquake History

Date	Magnitude	Details
February 28, 2001	6.8	12 miles from Olympia, WA; resulted in 400 injuries and $3.9 billion in damages in the Seattle/Tacoma area.
November 28, 1999	3.4	Klamath County, OR; shaking felt in Ashland 45 miles away.
December 4, 1993	5.1	Klamath County, OR, aftershock of September earthquakes. This was felt on the SOU Campus in many buildings.
September 20, 1993	5.9 and 6.0	Klamath Falls; resulted in 2 causalities and $10 million in damage.
April 25, 1993	7	Cape Mendocino, CA: Subduction zone earthquake at triple junction of the Cascadia Subduction Zone and the San Andreas and Mendocino faults.
March 25, 1993	5.6	Scotts Mills, $30 million in damage.
April 12, 1976	4.8	Near Maupin, OR: sounds described as distant thunder, sonic booms, and strong winds.
November 5, 1962	5.5	Portland/Vancouver area: shaking lasted 30 seconds and caused damage to masonry and windows.
April 14, 1920	5	Shocks were felt in the Crater Lake area; plaster cracked, windows broke, numerous trees and telephone poles were disturbed.
November 23, 1873	6.8	Earthquake along the Oregon-California border near Brookings, Oregon; felt in Portland and San Francisco. Absence of aftershocks led scientists to believe it was an intra plate earthquake.
January 26, 1700	9	Offshore Cascadia Subduction Zone caused tsunamis along the coastlines of Oregon, Washington, and Japan. Many Native American villages along the coast were destroyed.

Probability of Future Events

The entire western half of Oregon remains vulnerable to a large Cascadia event. Recent studies indicate that the probability for Cascadia Subduction Zone events on the southern margin of the fault is high. Based on historical averages, the southern end of the Cascadia Subduction Zone fault – from about Newport, Ore., to northern California – has a 37 percent chance of producing a major earthquake in the next 50 years, according to Chris Goldfinger, a marine geologist and professor in Oregon State University's College of Oceanic and Atmospheric Sciences, and one of the leading experts on the Cascadia Subduction Zone. (Oregon State University, 2010)

According to the Jackson County Natural Hazards Mitigation Plan, "Earthquake is ranked as the second highest natural hazard in the county's hazard analysis; it is estimated that there is more than one chance of an earthquake occurring in ten years" (pg. 8-10). Maps 4 and 5 illustrate Ashland's 30 and 50 year 5.0M or greater earthquake probability based on USGS's 2009 Earthquake Probability Mapping Application. (geohazards.usgs.gov/eqprob/2009/)

According to James Roddey with DOGAMI "Due to the amount of faulting in the area, the 1993 Klamath Falls earthquake is just business as usual for such a geologically active region. Historic

evidence, combined with geological evidence for large number of earthquakes in the pre-historic past, suggests that one or more coastal earthquakes capable of damage (magnitude 4-6) will hit south central Oregon within a few decades, so it pays to be prepared."

Vulnerabilities Assessment

The vulnerability assessment for earthquake hazards at SOU included analyzing seismic and historical data to determine the relative seismic risk of the geographic area of Southern Oregon as a whole. The University also evaluated data provided by DOGAMI in 2005, listing a preliminary Rapid Visual Survey (RVS) for 20 of SOU's buildings. This information combined with building replacement valves and building occupancy helped to prioritize mitigation activities along with buildings in need of further seismic retrofit studies.

The campus infrastructure is susceptible to seismic damage during an earthquake. Many of the University's primary structures were built before the adoption of national and statewide building codes and are especially susceptible to damage from a seismic event. There have been a number of new additions added on to older campus buildings. Even though the new addition may be built to a higher seismic code, the failure of the attached older parts of the building will compound damage to the newer portions. These building inadequacies pose a serious threat to campus property and, more importantly, pose a very serious threat to the safety of the students, faculty, and staff who occupy these buildings. Even in a minor earthquake, the potential damages to older buildings that were built prior to current safety codes are of major concern. Additionally, nonstructural hazards, which have been identified during this process, pose a threat to life safety and egress even during a minor earthquake.

Due to Ashland being surrounded by mountain ranges on all sides, road access into and out of this region is limited. Map 6 depicts DOGAMI's earthquake induced landslides hazard zones for Ashland. In addition, many of the bridges and overpasses on Interstate-5 have not undergone seismic upgrades, increasing the chance that the southern part of Oregon will be isolated after an earthquake.

Impact of Hazard on the University

Seismic waves that travel underground during an earthquake event will affect both the University buildings and the campus community that occupies those buildings, threatening occupant safety and damaging University property. These waves result in vibrations that cause damaging motion within structures, in some cases causing buildings to collapse. If the design of the building is outdated and not up to current seismic safety codes, partial or complete structural failure can result, harming the occupants inside the building. Even with a small earthquake, the motion can also cause contents within buildings to shift, especially items that have not been properly secured, such as bookshelves, computers, and file cabinets. If not properly secured, occupant safety could be threatened and valuable equipment and dangerous substances could lead to expensive replacement costs or become secondary hazards if they shake loose. Seismic motion may cause chemicals stored near one another to tip over leading to inadvertent mixing of potential toxic chemicals if these have not been properly stored and secured. In addition to damaged or collapsed buildings, SOU's utilities and technological infrastructure are also vulnerable to

ground motions and pose a challenge to the University's ability to operate if damaged extensively.

At the time of this update, one of the older historical buildings on campus, Churchill Hall, was scheduled to undergo a five million dollar renovation including seismic remediation.In each of the next three biennia, SOU is hoping to receive funding from the OUS to conduct a seismic retrofit in one of its buildings considered "high risk" during an earthquake.

Existing and Future Properties Vulnerable to Hazard

In 2005, DOGAMI and Oregon University System (OUS) inventoried the seismic resilience of many buildings across Oregon campuses using FEMA's Rapid Visual Survey (RVS) of Buildings for Potential Seismic Hazards (FEMA 154). SOU had 20 buildings evaluated and scored. The purpose of this report was to identify buildings at risk during an earthquake based on certain criteria including structure type, building age, geometry, condition, soil types, and occupancy. The report provides a score that can then be used to prioritize which buildings are recommended to have a complete engineering evaluation of seismic deficiencies (Wang, 2005).

OUS's Facilities Business Services has organized the buildings DOGAMI scored into three categories of prioritization: scores ranging from less than 0 to 1 are deemed "high risk" scores, between 1.1 and 2.5 are "medium risk", and scores above 2.6 are "low risk", see map 2.

Tables 3.2 and 3.3 list the campus buildings that scored medium or high risk, their 2011 estimated replacement value and additional comments made by DOGAMI during their RVS of SOU's buildings. A full engineering report is needed to specify future retrofits unique to each "high risk" and "medium risk" structure; however, these reports are beyond the scope of this risk assessment. Future buildings will be built to the most recent seismic requirements. The University will work with experts in the field in order to design buildings that are built to withstand large earthquakes. Areas undergoing re-models or new construction will have non-structural mitigation standards implemented for furniture and equipment.

Table 3.2 FEMA 154 "Medium" Scores for SOU Buildings

Building Name & Year Built	RVS Score	Estimated Replacement Value 2011	Reason for Recommended Evaluation
Cascade Complex - 1965	1.1	$49,945,951.00	Connecting corridor integrity and falling hazards from open lattice screen masonry and concrete slab canopies are concerns in this complex.
Computer Services-1990	1.2	$10,512,695.00	A steel moment frame building built prior to the Northridge earthquake. Building is clad in brick.
Central Hall-1949	1.2	$10,445,241.00	Contains radio station covering 6 counties. One of the oldest buildings on campus. Verify reinforcement and capacity of existing concrete shear walls.

Music Building-1972	1.4	$10,545,195.00	This building has heavy precast cladding; the anchorage may be inadequate when the concrete moment frame moves.
Stevenson Union Book Store Addn.-1990	1.7		Limited amount of seismic remediation included to Stevenson Union with this addition – primarily adding shear walls and seismic ties for suspected ceilings.
Susanne Homes Hall-1947	1.7	$7,737,256.00	This World War II vintage dormitory is constructed of unreinforced or non-ductile concrete. Shear wall capacity, floor and roof-to-wall connections, and forces connecting sections should be checked.
Science Hall I-1976	1.7	$21,603,250.00	This building is constructed of non-ductile concrete. Shear wall capacity, floor and roof-to-wall connections, and forces connecting section should be checked.
Central Heating Plant-1957	2.2	$10,445,241.00	Underwent seismic upgrade 2009
Total		**$121,234,829.00**	

Source: Department of Geology and Mineral Industries (DOGAMI), 2005 *SOU Earthquake Rapid Visual Screening Scores*. OUS Risk Assessment, 2010-201

Table 3.3 FEMA 154 "High" Scores for SOU Buildings

Building Name & Year Built	RVS Score	Replacement Value	Reason For Recommended Evaluation-per 2005 DOGAMI report
Churchill Hall-1925	-0.3	7,034,516.00	Will undergo seismic remediation in 2012
Britt Center-1935	-0.3	12,044,736.00	Second oldest building on campus. Verify concrete shear wall reinforcement and capacity and connections. Verify capacity and supports of wooden arches with 90 ft. span.
Stevenson Union-1972	-0.1	24,909,641.00	Lounge area in front of the building needs to have lateral load resisting elements. Shear wall capacity in the building and addition should be checked. Seismic forces in diaphragm around atrium also need to be evaluated, along with connections to bookstore addition, and precast cladding anchorage. Building was built prior to seismic codes in Oregon.
Science Hall II-1969	-0.1	21,603,250.00	Relies on its concrete moment resisting frame for much of its seismic resistance, acting with a minimal amount of shear walls within the structure. The movement

			of the frame may create a dangerous situation when combined with the heavy precast cladding. The building is also built on a pronounced slope.
Greensprings Residence Halls- 1969	0.3	16,344,986.00	Building is built on treated wood piles. Two of the four towers in this complex have a soft first story.
Theatre Arts Building-1980	0.4	9,647,309.00	This wood frame building has tall walls, brick cladding, and large diaphragm openings.
Roy McNeal-1955	0.7	23,491,689.00	There are many issues in this building that need to be checked, including tall slender walls, condition of materials, roof-to-wall connections, diaphragm strength, pounding, torsion, and partition wall anchorage.
Taylor Hall-1965	0.7	12,077,893.00	Z-shaped plan and open lattice screen masonry are major concerns on this building. Verify shear wall capacity.
Education/Psychology-1973	0.7	14,941,006.00	Does not have a designed seismic lateral load resisting system in the east-west direction.
Total		142,095,026.00	

Source: Department of Geology and Mineral Industries (DOGAMI), 2005 *SOU Earthquake Rapid Visual Screening and* OUS Risk Assessment, 2010-2011

Structural Vulnerabilities: Combined Risk and Asset Attributes and Maps

The combined risk and asset maps provide another way to understand vulnerability. The maps 1 2,7, and 8 illustrate the spatial variation of key university assets (occupancy, building replacement values, structural type, and content value). This data, along with FEMA 154 Rapid Visual Assessment scores, will help SOU prioritize the order in which buildings should receive seismic studies.

Design – Level Base Map

The Design Level Base Map combines individual buildings' replacement cost with the likelihood of failure during a seismic event. Combining information from the risk attributes previously listed such as type of construction (building class) and the year in which it was built gives a rough estimate of how a given structure will respond to ground shaking.

Based on FEMA 154-Rapid Visual Screening of Buildings for Potential Seismic Hazards, the OUS in 2005 categorized University buildings. The numbers are inversely proportional to the level of risk, i.e., Churchill Hall built in 1926 rates -0.3 whereas the retrofitted Heat Plant is rated a 2.2, built in 1956 but retrofitted in 2007.

In addition to the RVS, the OUS recalculates replacement costs values for insurance purposes each year. SOU used the 2010 data from OUS and combined these two factors to create a graphic picture of where best to spend limited resources in Hazard Mitigation, see map 2.

Occupancy/ Design Level Map

Protection of life is the priority of SOU's Hazard Mitigation Plan. Threats to health and safety may occur both inside and outside of campus buildings. Persons can be injured by falling debris or equipment.

In order to plan for such events, SOU's Enrollment Services provided data on campus building occupancy, which was then used to graphically illustrate when and where the largest concentration of students could be found campus during various days and times. Taylor and Science, (Map 7) have the largest concentration of students between ten in the morning until two. Information with this level of detail can help when prioritizing mitigation activities.

Similarly, Residential Life and Housing has provided data of the nighttime occupancy of individual Dorms on campus. The Cascade Complex has the most students at night (500-550 persons) and also mealtimes on account of the Cascade Kitchen located in the center of the complex. Family Housing on the opposite end (north) of campus is made up of a large concentration of multiple levels apartment buildings which house up to 600 persons, see map 8. There are also rental single-family residences within the campus boundary that would be the responsibility of Ashland City Fire Department and Police.

Critical Facilities

Map 3 depicts the buildings of critical importance for the protection of life and property. FMP is the Facilities Management and Planning where vehicles, equipment and schematic drawings of infrastructure are kept. Depending on the circumstances, FMP could be the site for the command post during a disaster as it is located on a relatively flat area north of Siskiyou Boulevard. Computer Services has the electronic version of map layers, GPS units and is the hub of communications. Computer Services would serve as a secondary command post. The Heat Plant (located at the base of a steep residential housing tract and an undeveloped wooded area, Roca Canyon) controls the steam and water heating throughout the campus via a tunnel system. The remaining buildings are student housing Resident Hall and the Health Center for medical needs.

Vulnerability of Infrastructure

The University's steam heat and most of the telecommunication system are contained within a tunnel system that goes to the majority of campus buildings. There are however numerous areas where water, storm drain and irrigation bisect these tunnels and are therefore potential points of disruption and/or flooding during a seismic event. The campus is irrigated by gravity fed canal water (750 gallons per minute) through a previous storm drain system. It is controlled by the Talent Irrigation District, which provides water to the downstream agricultural land and runs approximately mid-April until mid-October.

Domestic water, storm and sewer are primarily located in the roads but do cross the campus where formerly there were roads and/or houses, map 9. Major zone cut off valves have been located and mapped using ARCGIS 9.3 with specific attributes such as pipe size and valve locations, map 10.

Natural gas is used for heating and cooking in seven buildings on campus. Buildings can be isolated individually at the meter or if inaccessible due to disaster, could be isolated in two major sections. The west side of campus can be shut down at the Heat Plant while the eastside is controlled from a manhole access in Siskiyou Boulevard east of Wightman.

Bonneville Power through the City of Ashland provides electricity to the University. City of Ashland has provided the ARCGIS layers of the electrical grid, but has requested that it be kept confidential due to Homeland Security concerns. The Emergency Action Plan developed on campus is mapping the locations of electrical shut off panels within each building. Backup generators located in the Heat Plant will provide emergency power for the boilers and Library lighting. Computer Services also has backup generators to maintain communications and computer servers.

Risk Analysis/Estimating Potential Losses

Though the location, duration, and magnitude of any earthquake is impossible to predict, SOU can reasonably expect tens of thousands if not millions of dollars in damage from a 5.0 magnitude earthquake. 263,329,855.00 dollars are at risk based on fiscal year 2010-2011 replacement values of the University's high and medium risk buildings alone see map 2. This value does not include loss of equipment, research assets, loss of potential revenue, or intellectual property loss. More importantly one cannot begin to predict potential loss value for any lives that may be lost.

Wildland Fire Hazard

Location of Natural Hazard

The campus rests at the south end of the Rogue Valley in the Siskiyou Mountain Range. It occupies a north facing slope that lies alongside the Wildland Urban Interface (WUI), where residential areas and federal forestlands meet. SOU's upper campus is within a three-block proximity to this interface. The city is currently evaluating whether to expand the WUI boundary, thereby bringing the campus even closer to the boundary, if not into it. There is a number of University owned buildings above the main campus that are physically located in the WUI. Ashland has a low annual rainfall of 18-20 inches per year, increasing wildfire susceptibility. In addition, Ashland sits in a long open valley; this increases wind velocity, thereby exacerbating the fire.

Extent of Natural Hazard

The risk posed from fire is of high concern for the SOU campus community, primarily due to the close proximity to the Wildland Urban Interface (WUI). The WUI is any area where homes and wildlands mix, and they can be made up of forests, brush, or grass. Having homes and out-buildings intermixed with the forest leads to fuel loading. Directly above the campus to the south is the WUI. The highest losses of lives and homes occur when wildland fires burn into dense neighborhoods. Examples of this are the past fires in Oakland (1991), San Diego county (2003), and South Lake Tahoe (2007) (Ashland Fire Rescue, 2011). Ashland, being similar to these

communities in vegetation types and weather, now has approximately 1,400 homes in the WUI. Choices of landscaping, site location, and building material can elevate the risk of fire in the WUI. The logistical concerns including evacuation, air quality, and loss of critical utilities for residents on campus must be addressed thoroughly. The greater Ashland area has experienced numerous wildland fire events that have lead to evacuations, destroyed homes and out buildings, and created air quality concerns for residents. In order to help decrease the loss of property and life, it is vital that the university have a comprehensive plan for evacuation in the event of a threatening wildfire and that appropriate mitigation measures are taken to prevent buildings from being threatened by wildland fires.

With proper attention and maintenance, fuels around buildings can be evaluated and subsequent risks can be mitigated. Specific fire resistive building structural composition can also protect a building from wild fire damage.

The majority of buildings on campus are built of concrete or bricks that act as exterior fire deterrents. Unfortunately, many of these buildings have single pane windows with no screens, increasing the risk of spot fires spreading into the interior building. Three of the four Residence Hall Complexes are within three blocks (1452 Feet) of the WUI boundary, see map 1. Of these, only one is fully sprinkled in every room. Cascade Hall is the largest residence hall and includes nine individual halls and has no sprinkler system, see map 11.

Previous Occurrences of Natural Hazard

Wildfires are a common and widespread natural hazard in Oregon. Fire is a critical component of the forest and rangeland ecosystems found in all portions of the state. Over 41 million acres of forest and rangeland in Oregon are susceptible to wildfires, which may occur during any month of the year, but usually occur between July and October. The principal type affecting Oregon communities is interface fire, which occurs where wildland and developed areas intermingle with both vegetation and structures that combine to provide fuel. As more people have moved into wildland interface areas, the number of large wildfires impacting homes has escalated dramatically. The Southwest Oregon Region is particularly vulnerable to wildfires. This region has more than 160,000 people, or 48 percent of its population, residing in the WUI (SW Oregon Regional Profile, 2009).

According to Oregon's Natural Hazard Mitigation Plan's wildfire chapter:

> *The summer of 2002 included eleven Emergency Conflagration Act incidents, with as many as five running concurrently. More than 50 structures burned and, at one point, the entire Illinois Valley in Josephine County seemed under siege from the Biscuit Fire. This wildfire threatened the homes of approximately 17, 000 people, with over 4,000 homes under imminent evacuation alert. At almost 500,000 acres, it was the nation's largest wildfire of the year. (pg. 3)*

The community of Ashland has seen a number of large forest fires in recent history. The most recent fire was the 15-acre Oak Knoll fire of 2010, which started as a grass fire, jumped

Interstate 5, and burned 11 homes, with an estimated loss value of 3.5 million dollars. In September 2009, the Siskiyou Fire burned 138 acres on the south end of town, destroying a home and out-building, with losses estimated at a half a million dollars. Both of these fires were less than two miles from the University. In addition, there have been multiple smaller one to three acre grass fires within 2 miles of the campus over the past few years, some bordering the campus property line.

Table 3.4 Wildfires in City of Ashland

Date	Acres	Details
August 24, 2010	15	Oak Knoll Fire-15 acres that started as a grass fire jumped Interstate 5 and burned 11 homes with an estimated loss value of $3.5 million two miles from campus
September 21, 2009	13	The Siskiyou Fire burned 138 acres on the south end of town with losses estimated at a half a million dollars. 1.3 miles from campus
August 13, 2002	1,947	The East Antelope fire burned nearly 2,000 acres seven miles NE of Ashland. Cost of the fire control effort was $1.3 million.

Source Ashland Fire and rescue, Oregon Department of Forestry, and Bureau of Land Management

Table 3.5 Wildfires (greater than 125 acres) in Jackson County

Date	Acres	Details
September 5, 2011	476	Little Butte Fire, 12 mi NE of Ashland
August 18,2011	400	Tin Pan Fire 3 outbuildings burned
September 12, 2010	160	Blackwell Rd, one home burned
July 29, 2009	156	Burnt Peak
September 17, 2008	1,238	Doubleday
June 11, 2007	142	Dry Creek
July 26, 2005	1,510	Wasson
July 5, 2003	715	Cove
July 15, 2002	223	Lost Creek
July 13, 2002	198	Nail Rock
January 7, 2001	206	Wagner Creek Road
August 8, 2000	376	Antioch Road

Source Ashland Fire and Rescue, Oregon Department of Forestry, and Bureau of Land Management

Table 3.6 Wildfires in Surrounding Counties

Date	Acres	Details
13 July 2002	499,968	The Biscuit fire, Oregon's largest fire to date, burned nearly half a million acres in the Kalmiopsis Wilderness and the Siskiyou Mountains. It took four months to control, threatened over 17,000 people, and cost $56 million to fight (Oregon Department of Forestry).
August 9, 2001	6,100	The Quartz fire began on August 9, caused by a lightning strike, and burned until August 25.

Source Ashland Fire and rescue, Oregon Department of Forestry, and Bureau of Land Management

Probability of Future Events

It is not a matter of if another wildfire will occur; it is a matter of when another wild fire will occur in or near Ashland. As evidenced from the tables above, this area faces wildfires every year. High temperatures, low humidity and regular afternoon winds result is frequent Red Flag fire warning days during the summer months. Thunderstorms frequent the region during the summer months, increasing the risk for lightening induced wildfires. Jackson County reaches Extreme Fire danger status every summer.

Although the risk for wild fire does decrease during the winter and spring, the City of Ashland is considered such a high fire risk there are no fireworks or any open burning allowed with in the city limits year around.

Vulnerabilities Assessment

The University is vulnerable to structural fires secondary to wildfire. These may result in injuries, exacerbation of medical conditions such as asthma, and the potential loss of life. Fire is most likely to destroy campus buildings.

Impact of Hazard on the University

Due to the campus's close proximity to the Wildland Urban Interface (WUI), the risk of a wildfire in close proximity to the campus is great, see map 1.

A fast- moving wildfire in close proximity to SOU produces the following hazards**:**

- Most buildings do not have internal intercom systems to announce immediate evacuation.
- Many buildings are only partially sprinkled, refer to map11, and cannot be used to shelter in place.
- Many buildings are not fully sprinkled and are at increased risk of burning should an ember spark a fire.
- The older residence halls and buildings have single pane windows increasing the risk of the window exploding from heat and allowing embers to enter the building.

- Many buildings have no cell phone reception; this prevents individuals from receiving cell alerts (texts& calls) from the mass notification system.
- The two main roads off of the campus are also two of the main roads available for WUI residents to use for evacuation and also for the fire departments to use to access the WUI.
- The University relies on City fire and police departments for all 911 responses. Receiving structural protection to cover all of the campus buildings will be next to impossible for the City fire department to provide.

These hazards place the university at risk for extensive building damage from a wildfire and economic loss, but more importantly they place human life at risk.

Existing and Future Properties Vulnerable to the Hazard

The University will always be at risk for wildfires due to its proximity to the WUI boundary. As mentioned previously, the university was threatened by two wildfires both within two miles of campus. Fortunately, neither of them started in the WUI. The City of Ashland is currently in the early phases of exploring expansion of the WUI boundaries. If this occurs, the campus may be closer to the WUI boundary or possibly even within the boundary. The University has no plans to build any new facilities near the WUI boundary and is working with the city fire department to create a Firewise campus.

Structural Vulnerabilities

Mapping allowed the University to identify which buildings on the campus contained full, partial or no sprinkler systems, map 11. Combined with their location to WUI and building type allowed identification of mitigation needs and assisted in prioritization of action items for the buildings.

Risk Analysis/Estimating Potential Losses

Although it is impossible to predict the exact damage, which would occur from, a wildfire on or near the campus, based on the number of buildings that do not have sprinkler systems the University is at risk for extensive damage from a structural fire or fires.

Severe Storm Hazard

Location of Natural Hazard

SOU is located in the southern tip of Oregon's southwestern interior, climate zone 3 (National Climate Data Center, 2011). It is bordered by the Cascade mountain range along the east and the Siskiyou and Klamath mountains to the south. The university's unique location (adjacent to high coastal mountains and situated in a valley) generates weather significantly different from other places in western Oregon.

According to the City of Ashland Public Works department, the University does not sit in a 100 year or 500 year flood inundation zone or floodplain; although, SOU is affected by secondary flooding issues.

Extent of Natural Hazards

The extent and degree of the snow, wind, rain, ice, and hailstorms vary year to year, although the University has experienced all of these types of storms. SOU's severe storm events, Table3.7 reflect the chronic losses, which resulted from snow, wind, rain, ice, and severe freeze and hail storms.

Previous Occurrences of Natural Hazards

Over the past 50 years, Southern Oregon has been affected by severe storms leading to heavy rain, snow, hail, and/or wind. According to the National Oceanic and Atmospheric Administration, Jackson County has had 231 events that met NOAA's requirements for their storm event database between 1990 and 2011 (NOAA, 2011). Ashland is threatened by hazards generated by weather almost every year. Storms bring heavy rains, strong winds, ice, and snow. Flooding and landslides can accompany these storms. Damaging storms are the most common from October through April (Jackson County, 2006).

These severe weather events can put life, safety, and property at risk at SOU. Ice, wind, and snow can affect the stability of trees, power lines, telephones lines, television, and radio antennas. Falling trees, limbs, and saturated soils can become hazards for buildings, cars, utilities, and people. These hazards frequently lead to property damage and disruption of utilities and infrastructure. Table3.7 highlights local storms that have affected the University. The two largest were the flooding of downtown Ashland in January 1997 that caused the University to close for ten days due to no running water and a rain/hail storm in the fall of 2008 that led to over $600,000.00 worth of damage from flooding in buildings and hail damage.

Winds

Southern Oregon's predominant wind pattern is from the northwest to the southeast, usually April to September. High winds associated with storm weather blow from the southeast. The winter storms arise in the west-southwest and cause southeasterly winds carrying cold fronts, November to February. Winds during spring and summer are more consistently from the NW due to valley heating. (National Resource Conservation Service, n.d.).

Winter storms

Winter storms commonly come from the southwest Pacific Ocean and up through the Siskiyou Mountain Pass (4,500 feet mean sea level). Additionally, storms spawned in the Gulf of Alaska bring freezing temperatures, rain, and/or snow to this region. Due to its higher elevation, Ashland receives heavier snowfalls than surrounding communities. The Ashland campus is situated on a slope whose average elevation is 2,100 feet and receives snow when lower elevations in town do not. Interstate 5, Ashland's main route of commerce and transportation, closes for extended periods during severe snowstorms. This leaves motorists stranded, many of which are commuting SOU students and employees.

Flooding

Jackson County receives 18 inches of rainfall per year, 80% of which falls between October and April. The rainfall, combined with melting snowpack from the surrounding mountain ranges,

can lead to flooding. The University does not sit within a flood zone (inundation zone) from the many nearby creeks and reservoirs. However, SOU receives its domestic water from the City of Ashland, whose treatment plant does sit in the floodplain. The water treatment plant has been affected by local flooding, most recently the New Year's Eve flood of 1997, which left the University with no water for ten days. Heavy rainfall within a short duration can lead to flooding on campus in low lying areas, leaky roofs, and in our utility tunnel system which is bisected by irrigation and sewer lines.

Table 3.7 Severe Storm Events

Date	Type	Details	SOU Insurance Claims
December 2009	Ice, severe freeze	Lost natural gas for 36 hours	N/A
October 2008	Rain, hail, storm	Roof damage, roof leaking, minor flooding in buildings	$661,069.00
January 2008	Severe wind	High winds in county led to fallen trees and branches and damage to buildings. One causality occurred in Jackson County	N/A
January 2007	Ice and severe freeze	Broken water pipes, water damage to buildings	$1,965.00
December 20, 2006	Severe freeze	Sprinkler system froze	$40,809.00
Winter 2003-04	Snow	Heavy snowfall on most of Oregon in December 2003. The largest snowstorm to hit Jackson County in a quarter of a century. Interstate 5 was closed for 24 hours leaving motorists stranded who had to be dug out of snowdrifts of 60 feet.	N/A
January 1999	Ice, severe freeze	Shrub and plants died, SNWC sprinkler pipes ruptured in ceiling, family housing water pipes and water heaters froze.	$10,176.00
January 1997	Flooding	No water for 10 days, school delayed opening for 1 week	N/A

Sources: Region 4; Southwest Oregon Regional Profile of State Natural Hazard Mitigation Plan and State of Oregon Department Administrative Services

Probability of Future Events

According to Oregon's NHMP for Southwest Oregon, Jackson County scores a high probability of a significant winter storm occurring in the next 10 to 35 years. Jackson County also scores a

high vulnerability with more than 10% of the region or population affected from a severe weather event (Oregon NHMP, 2009).

Vulnerabilities Assessment

The University is vulnerable to wind storms, heavy rainfall, hail, and snow storms. Although they may lead to injury or loss of life, the most likely scenario will be damage to campus buildings and infrastructure losses resulting in damaged or destroyed research and assets.

The campus has hundreds of tall trees on the property that are vulnerable to strong winds, snow and ice pack. During severe weather storms, these trees and their branches can fall and damage property or injure those in their immediate radius.

Almost all buildings on campus are at risk of trees falling on them. Falling trees can penetrate building envelopes, damaging facades and valuable contents, including valuable University assets and equipment. Almost all the pedestrian paths have trees in close proximity that could potentially fall and strike a person. Not only do strong winds have the potential to blow down trees, but they can also lead to building structural damage.

The campus experiences periods of intense rainfall, which can cause flooding issues in campus buildings. The City's storm water drainage system (in the vicinity if the SOU campus) is inadequate to handle heavy flows of storm water.

Whightman Street has inadequate curb inlets to handle storm water overflow from Sisikiyou Boulevard during heavy rains. Storm water flows from Whightman Street into Webster Street, where it ponds at the entrance to McNeal. The 24" storm water drain line (maintained by SOU) that runs east of McNeal, under the football field, and east of the women's softball field, is not adequately sized to handle heavy rains. In 2008, heavy rainfall caused flooding at Family Housing, east of Whightman. Storm water also entered low-lying entrances to several campus buildings – McNeal, Britt and the Access Center. Roof drains to campus buildings are connected to below – grade storm water lines. If the below – grade lines get clogged, rainwater can pound on roofs (as happened at Britt Hall in 2008), threatening structural collapse.

The storm water drainage systems in campus parking lots have been compromised in the past by the unwitting removal of sections of curb to provide accessibility. Instead of storm water being directed to catch basins by the curb, the storm water is allowed to flow from the parking lots onto grade leading to free standing water collection.

Freezing temperatures place the campus at risk. Water pipes can freeze and burst. If natural gas is lost, the campus relies on boilers fueled by diesel oil to heat the residence halls and other buildings. Snow and ice can lead to problems with transportation and make traveling by foot or car dangerous. Power lines, telephone lines, cell, and other communication towers are at risk of breaking due to accumulation of snow and ice. Electricity is provided to the campus from outside sources. Loss of electricity leads to an inability to run the fans and to heat most buildings on campus, including all of the Residence Halls. Additionally, SOU does not have generators in any of the Residence Halls, therefore creating an environment with no light and no heat.

With our unique weather patterns and mountain passes leading into and out of the valley in all directions, large snow or ice storms lead to the inability for many to leave the valley. Combined with the potential for the loss of power and inability to heat the Residence Halls the campus is at risk for having a 1,000 students stranded on the campus.

Although the university is not at risk for riverine flooding, much of Ashland is at risk for riverine flooding, including the water treatment plant. In addition, the flood inundation zone includes the interstate and state highway leading to Ashland from the North, limiting access into and out of town for students, staff and faculty. The University relies on the City for its potable water and sewer system. The floods of 1997 lead to contaminated water and no sewer for ten days, closing the university; affecting the economic livelihood of all employees, and the university, interrupting business continuity, and halting educational and research enterprise.

Impact of Hazard on the University

Severe winter storms can put life, safety, and property at risk at SOU. Ice, wind, and snow can affect the stability of trees, power lines, telephones lines, television, and radio antennas. Falling trees, limbs, and saturated soils can become hazards for buildings, cars, utilities, and people. Loss of utilities or building damage can lead to closure of all or part of the campus. This closure leads to loss of academic days, but also leads to loss of business revenue for the University and the small business located on or adjacent to our campus Additionally, student employees, staff and faculty will loss pay.

Storm induced building damage can lead to both monetary and academic losses. Monetary losses arise from damage to buildings, equipment, and supplies. Academic losses may include loss or damage to intellectual property, research data, or educational material.

Existing and Future Properties Vulnerable to the Hazard

Severe storms will always plague the campus. The university will work to mitigate potential damage from severe storms with existing properties including, tree trimming, and working with the City to move remaining utility lines underground. When building new structures, severe weather mitigation activities may include such things as adding generators to future Residence Halls, including overhead speaker systems in the buildings and assessing for tree hazards. The University will partner with the city utilities department to assess water flow and drainage issues on any land college planned for future development.

Risk Analysis/Estimating Potential Losses

Although the nature and severity of storms are impossible to predict, historic information regarding damage and claims indicates that a single storm could easily cost $100,000 or more. Historical data from the State of Oregon Department Administrative Services shows one single storm led to over a half a million dollars in insurance claims for the University.

Section 4
Mission, Goals & Action Items

This section introduces the goal and action item framework for Southern Oregon University's Natural Hazard Mitigation Plan. The information provided in the Risk Assessment provides the basis and justification for the mission, goals and actions identified in this plan. The information in this section is based on the comparison of the information in Section 2 – Campus Overview and the information in Section 3 – Risk Assessment.

Mission, goals and action items are defined as:

- Mission— The mission statement is a philosophical or value statement that answers the question "Why develop a plan?" In short, the mission states the purpose and defines the primary function of the university's Natural Hazards Mitigation Plan. It is broad enough that it need not change unless the university environment changes.

- Action Items— The action items are detailed recommendations for activities that university departments, members of the campus community and others could engage in to reduce risk.

Mission

Southern Oregon University is an inclusive campus community dedicated to student success, intellectual growth, and responsible global citizenship. Building from SOU's mission statement, the steering committee developed the following mission statement for this NHMP

Through partnerships and sustainable mitigation efforts work to prevent loss, protect life, property, and the environment from natural hazards.

Goals

Goals have two purposes: to drive actions and to represent the general end toward which the university's effort is directed. Goals identify how the university intends to work toward mitigating risk from natural hazards. The goals are guiding principles for the specific recommendations that are outlined in the action items. The goals put forward by this plan are:

GOAL 1 - Protect life and reduce injuries resulting from wildfire, earthquake and severe storm events.

GOAL 2 - Minimize potential damage to SOU property while protecting the environment.

GOAL 3 – Reduce disruption of essential infrastructure and critical services on campus from natural hazards.

GOAL 4 – Increase awareness and promote risk reduction activities through education and outreach.

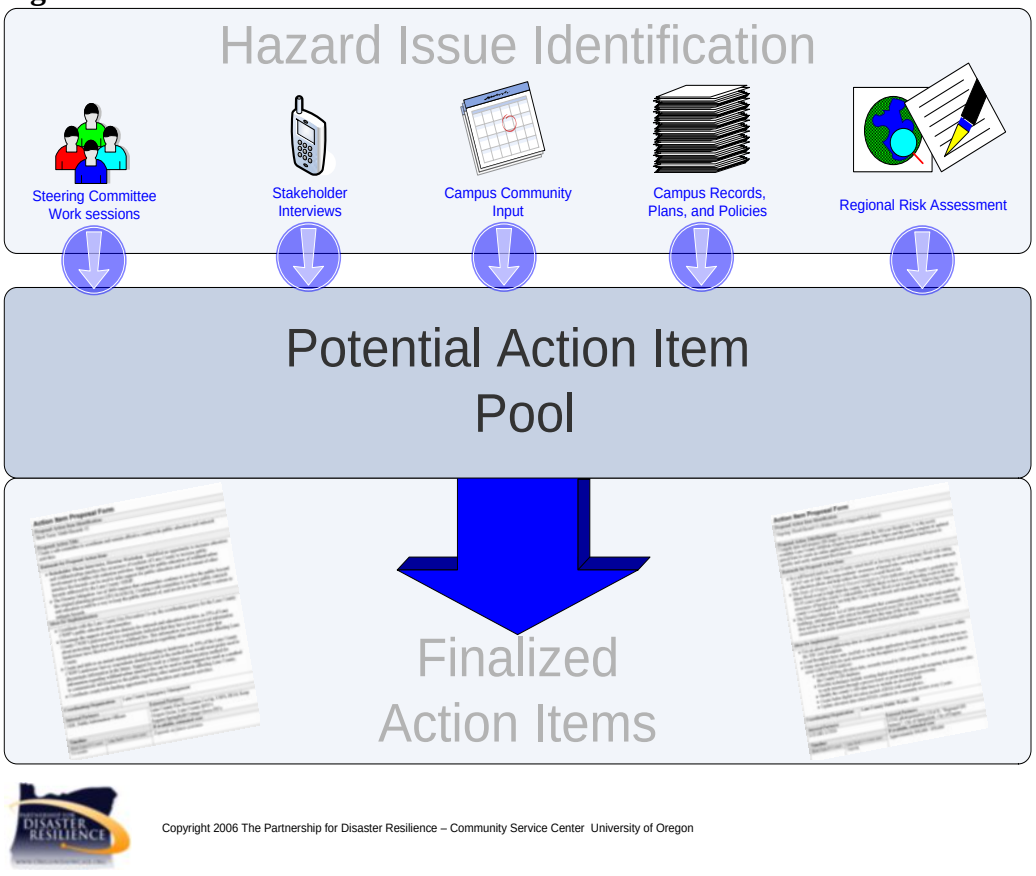
GOAL 5 – Document and evaluate campus progress in achieving mitigation activities through plan implementation and further mitigation practices on campus.

Action Items

The action items are detailed recommendations for activities that the university and its partners could engage in to reduce risk to natural hazards. The action items address the issues identified in the risk assessment and the values identified in the planning process.

To facilitate implementation, each action item is described in a worksheet, Appendix C. Including information on alignment with plan goals and existing plans and policies, rationale, ideas for implementation, coordinating and partner organizations, timeline and status. The process for identifying potential sources of action items is shown below in Figure 4.1 The action item worksheets can assist the university in packaging potential projects for grant funding.

Figure 4.1 Action Item Identification Process



The action item worksheet components are described below**.**

Alignment with Plan Goals

Each action item must be tied to a plan goal. The plan goals addressed by each action item are identified as a means for monitoring and evaluating how well the mitigation plan is achieving its goals following implementation.

Alignment with Existing Plans and Policies

Incorporating mitigation action items into existing plans and policies, such as strategic plans or campus master plans, will increase the likelihood that it will be implemented.

Rationale

Action items should be fact-based and tied directly to issues or needs identified throughout the planning process. Each action item includes a summary of the critical issues that the item will address. Issues were identified from a number of sources, including participants of the planning process, noted deficiencies in campus capability, and the risk assessment. The rationale for proposed action items is based on the information documented in Section 2: Campus Profile and Section 3: Risk Assessment.

Ideas for Implementation

The ideas for implementation offer a transition from theory to practice. This component of the action items is dynamic, as some ideas may be not feasible and new ideas can be added during the plan maintenance process (for more information on how this plan will be implemented and evaluated, refer to Section 5: Maintenance and Implementation).

Coordinating Organization

The coordinating organization is the group on campus that is willing and able to organize resources, find appropriate funding, and oversee activity implementation, monitoring, and evaluation.

Internal Partners

Internal partners are groups within the university that may be able to assist in the implementation of action items by providing relevant resources to the coordinating organization.

External Partners

External partner organizations can assist the coordinating organization in implementing the action items in various functions and may include local, regional, state, or federal agencies, as well as local and regional public and private sector organizations.

Timeline

Action items include both short and long-term activities. Each action item includes an estimate of the timeline for implementation. *Short-term action items* are activities that may be implemented with existing resources and authorities within one to two years. *Long-term action items* may require new or additional resources and/or authorities, and may take between two and

five years to implement. Ongoing actions are actions that do not necessarily end at a given point in time

Status

As action items are implemented or new ones are created during the plan maintenance process, it is important to indicate the status of the action item—whether it is new, ongoing, or complete. Documenting the status of the action, whether completed, ongoing or new will make reviewing and updating mitigation plan easier during the plan's next update, and can be used as a benchmark for progress.

Action Item Matrix

The Action Item Matrix shows the linkages between the goals and action items, and the coordinating organization. Each action item has a corresponding action item worksheet describing the project, identifying the rationale for the project, identifying potential ideas for implementation, and assigning coordinating and supporting organizations. These action items can be found in Appendix C. SOU's Steering Committee developed the following Action Item Matrix.

Figure 4.2 Southern Oregon University Action Item Matrix

Goal 1. Protect life and reduce injuries resulting from wildfire, earthquake and severe storm events

Action Item Description	Coordinating Organization	Internal Partners	External Partners
1.1 Completely sprinkle all Residence Halls	Residence Life & FMP	EHS	Ashland Fire Department & American Campus Community
1.2 Formulate a plan for non-structural mitigation standards throughout campuses for both existing and new construction.	FMP	EHS, Schneider Art Museum, & Hannon Library	OHSU Nursing
1.3 Secure specialized building contents via non-structural retrofits	FMP	Building Managers, Planning, EHS	
1.4 Continue to partner with the City of Ashland and Jackson County for coordinated emergency operation, mitigation, and response activities.	CMT		City of Ashland, & Jackson County

1.5 Install external audible warning system on existing and new buildings.	CPS & FMP		Johnson Control
1.6 Implement Firewise wildfire reduction recommendations on new and existing buildings and campus footprint.	FMP		Ashland Fire Department
1.7 Establish evacuation assembly points and identify with signage	EHS	CMT	Ashland Fire Department

Goal 2. Minimize potential damage to SOU property while protecting the environment

Action Item Description	Coordinating Organization	Internal Partners	External Partners
2.1 Assess the structural vulnerability of buildings by qualified engineers.	EHS	FMP	Contracted structural engineer, contracted architect, FEMA, OUS
2.2 Develop proposals and secure funding for mitigation activities, which qualify for FEMA funding.	CMT		Disaster resilient University
2.3 Formulate a plan and start to address storm water flooding issues for both existing and new construction.	FMP		City of Ashland, & Jackson County
2.4 Incorporate mitigation activities (structural & non-structural) during remodel of Science building	FMP	EHS	Contracted structural engineer & construction company, contracted architect, City of Ashland
2.5 Develop a post-disaster debris management plan.	FMP	CMT	City of Ashland, Oregon Department of Transportation

Goal 3. Reduce disruption of essential infrastructure and critical services on campus from natural hazards

Action Item Description	Coordinating Organization	Internal Partners	External Partners
3.1Further develop redundancy plans for Telecom/Network Services	IT/telecom	FMP	Century Link, Hunter Telecom, & NERO
3.2 Assess and report on the vulnerability of campus utilities	FMP	IT/telecom, CMT	City of Ashland, Ashland Fiber Network, Avista
3.3 Partner with Jefferson Public Radio (JPR) in evaluating the stability of external broadcasting equipment and address the needs for mitigation accordingly.	Executive Leadership Team		Jefferson Public Radio Foundation, FCC
3.4 Partner with Rogue Valley Television (RVTV) in evaluating the stability of external & internal broadcasting equipment and redundancy; address the needs for mitigation accordingly.	Associate Provost	FMP, RVTV	FCC
3.5 Apply emergency planning and mitigation activities into job descriptions of essential personnel.	HR		

Goal 4. Increase awareness and promote risk reduction activities through education and outreach

Action Item Description	Coordinating Organization	Internal Partners	External Partners
4.1 Expand existing public awareness information campaign for incoming Residence Hall students to include all incoming students.	CPS & Student Affairs		Ashland CERT

4.2 Create educational program and provide training targeting faculty and staff regarding non-structural mitigation practices for offices, data back-up practices	CMT	HR, Associate Provost, Deans, ELT	
4.3 Create educational program and provide training for SOU decision makers (i.e., Academic Deans, Department Heads, and the President's Cabinet) regarding ways to integrate mitigation activities into everyday practices throughout campus.	CMT	Academic Affairs & Student Affairs	
4.4 Develop an awareness strategy targeted at visitors (i.e., camps, sporting events).	EHS	CPS, Housing, Athletics, Theater & Music Hall, Ollie	
4.5 Develop cohesive hazmat evacuation and response drills/systems for science complex.	EHS	Science Department	Ashland Fire Department, Region 8 HazMat team

Goal 5. Document and evaluate campus progress in achieving mitigation activities through plan implementation and further mitigation practices on campus.

Action Item Description	Coordinating Organization	Internal Partners	External Partners
5.1 Identify location and value of art, antiquities, and specialized items on campus, and secure accordingly.	Finance	Hannon Library, SMA	
5.2 Continue to develop continuity of operation plans (COOP) for the university.	Human Resources	All departments	

CPS=Campus Public Safety, CMT=Crisis Management Team, FMP=Facilities Management & Planning, ELT=Executive Leadership Team, EHS=Environmental Health & Safety, SMA=Schneider Museum of Art

Section 5
Maintenance & Implementation

This section explains the process used to adopt, implement and maintain the plan. To ensure that the plan is responsive to the needs of the entire university community, many university units must be involved in its maintenance and implementation. A clear structure will help coordinate these groups and ensure that the plan implemented.

Plan Adoption

The Southern Oregon University Natural Hazard Mitigation Plan received FEMA pre-approval on_____ it was adopted via letter of promulgation by the President of Southern Oregon University on _____ and the plan received formal approval from FEMA on _____.

Plan Implementation and Maintenance

This section details the formal plan implementation and maintenance process. Proper maintenance of the plan will ensure that it remains an active and relevant document and maximizes the university's efforts to reduce risks posed by natural hazards.

Implementation Structure

There are two important parts in the university's efforts to implement and maintain this plan: the Steering Committee and the Plan Coordinator. The Steering Committee, the same group of administrative and auxiliary units that helped develop the plan, ensures that the plan is implemented and ultimately integrated into existing university policies and programs. The Plan Coordinator serves as day-to-day manager and staff to the Steering Committee providing essential coordination, communication, and technical oversight on plan maintenance and implementation.

Steering Committee

The Steering Committee was responsible for plan development, and will continue to be responsible for oversight, monitoring and guidance with the implementation of the mitigation plan. This committee is comprised of representatives from administrative units that have a defined role or responsibility for any element in the university NHMP. The Steering Committee provides oversight and guidance on the plan; ad hoc working groups can be responsible for carrying out the plan's defined action items, plan updates and development, training and plan drills, and outreach activities. Steering Committee members can appoint staff to the working groups on an as needed basis to carry out specific projects. The Steering Committee is composed of many individuals who are involved with other University policies, procedures and planning activities. These members are also responsible for assisting in incorporating Action Items from this plan with these other items. The Steering Committee will decide prioritization of specific

action item tasks or implementation with input from both internal and external partners. Data collected from the development of this NHMP (replacement value, cost to implement, length of time, funding availability, etc.) will be used to assist in prioritizing the Action Items implementation.

Committee Responsibilities

The roles and responsibilities of the Steering Committee include:

- Providing oversight and periodic evaluation and update on the current university Natural Hazard Mitigation Plan in accordance with the prescribed maintenance schedule defined in the plan;
- Prioritizing and implementing plan action items;
- Developing and coordinating ad hoc and/or standing working groups as needed;
- Monitoring the Action Item implementation;
- Recommending funding for hazard risk reduction projects;
- Assist in incorporating Action Items from this plan with other plans, policies and procedures and;
- Serving as the campus evaluation committee for funding programs such as Pre-Disaster Mitigation Grant Program and the Hazard Mitigation Grant Program.

The Steering Committee will meet twice each year to perform its duties and will enlist the help of other university staff to serve on working groups to implement certain projects

Members

The following units will comprise the Steering Committee:

- Co-Directors of Campus Public Safety
- Chief Information Officer
- Director of Facilities, Management and Planning
- Director of Institutional Research
- Manager Environmental Health & Safety
- Director of Marketing and Public Relations
- Director of Student Health and Wellness Center
- Administrative Services Coordinator – Finance and Admissions

- Director of Business Services
- Director of Human Resources
- Operations Director Residential Life
- Associate Provost
- Dean of Students

Plan Coordinator

The mitigation actions proposed in the plan will not get implemented without campus-wide support and a person to coordinate and ensure their implementation. The Plan Coordinator should be the same person responsible for facilitating the plan creation process. The Plan Coordinator will complete the following tasks:

- Convene the Steering Committee meeting and coordinate dates, times, locations, agendas, and member notification;
- Document outcomes of Committee meetings;
- Serve as a communication conduit between the Steering Committee and key plan stakeholders;
- Collaborate with other Disaster Resistant Universities to share best practices;
- Conduct outreach and awareness campaigns for students, staff and faculty;
- Act as a liaison to ensure NHMP Action Items are incorporated into other University plans as appropriate;
- Document successes and lessons learned; and
- Coordinate the development of grants proposals for implementation of the plans actions items.

Implementation and Maintenance Meetings

The Steering Committee will be responsible for maintaining, monitoring and updating the plan through a series of meetings outlined below:

Semi-Annual Meetings

The Steering Committee will meet on a semi-annual basis.

During the first meeting the Steering Committee will:

- Review existing action items to determine appropriateness for funding;
- Identify issues that may not have been identified when the plan was developed;

- Prioritize potential mitigation projects using the methodology described below;
- Educate and train new Steering Committee members on the plan and mitigation in general; and
- Assist in development of funding proposals for priority action items.

In the second meeting of the year, the Committee will

- Review existing and new risk assessment data
- Discuss methods for continued public involvement; and
- Document successes and lessons learned during the year.

The Plan Coordinator will be responsible for documenting the outcome of the semi-annual meetings. The process the Steering Committee will use to prioritize mitigation projects is detailed in the section below.

Action Items Prioritization Process

The Disaster Mitigation Act of 2000 requires jurisdictions to identify a process for prioritizing potential actions. Potential mitigation activities often come from a variety of sources; therefore the project prioritization process needs to be flexible. Figure 5.1 illustrates the project development and prioritization process.

Figure 5.1 Project Prioritization Process

Step 1: Examine funding requirements

The first step in prioritizing the plan's action items is to determine which funding sources are available. Several funding sources may be appropriate for the university's proposed mitigation projects. Examples of mitigation funding sources include but are not limited to: FEMA's Pre-Disaster Mitigation competitive grant program (PDM), Flood Mitigation Assistance (FMA)

program, Hazard Mitigation Grant Program (HMGP), university general funds, and private foundations, among others.

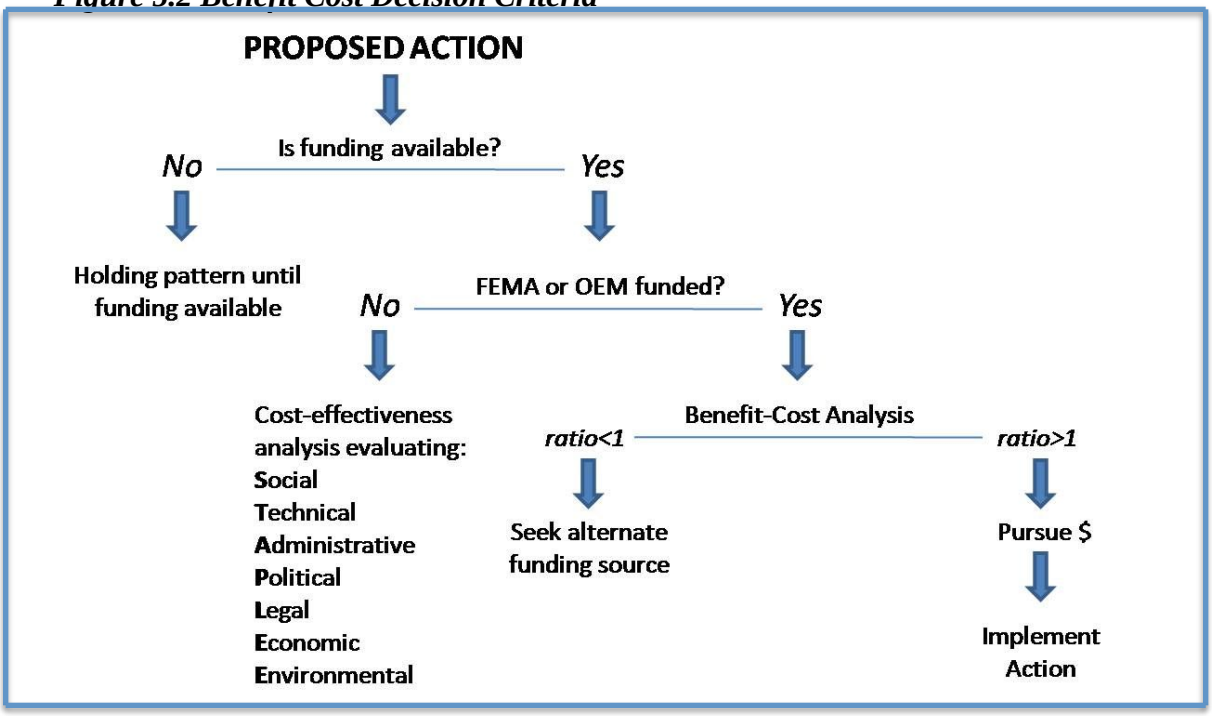
Because grant programs open and close on differing schedules, the Steering Committee will examine upcoming funding streams' requirements to determine which mitigation activities would be eligible. The Steering Committee may consult with the funding entity, Oregon Emergency Management, or other appropriate state or regional organizations about project eligibility requirements. This examination of funding sources and requirements will happen during the semi-annual plan maintenance meetings.

Step 2: Complete risk assessment evaluation
The second step in prioritizing the plan's action items is to examine whether or not the action is recommended based on the findings of the risk assessment. The Steering Committee will determine whether or not the plan's risk assessment supports the implementation of eligible mitigation activities. This determination will be based on the location of the potential activities, their proximity to known hazard areas, and whether campus assets are at risk. The Steering Committee will additionally consider whether the selected actions mitigate hazards that are likely to occur in the future, or are likely to result in severe / catastrophic damages.

Step 3: Steering Committee recommendation
Based on the steps above, the Steering Committee will recommend which mitigation activities should be moved forward. If the Steering Committee decides to move forward with an action, the coordinating organization designated on the action item form will be responsible for taking further action and, if applicable, documenting success upon project completion. The Plan Coordinator will convene a meeting to review the issues surrounding grant applications and to share knowledge and/or resources. This process will afford greater coordination and less competition for limited funds.

Step 4: Complete quantitative and qualitative assessment, and economic analysis
The fourth step is to identify the costs and benefits associated with the selected natural hazard mitigation strategies, measures or projects. Two categories of analysis that are used in this step are: (1) benefit/cost analysis, and (2) cost-effectiveness analysis. Conducting benefit/cost analysis for a mitigation activity assists in determining whether a project is worth undertaking now, in order to avoid disaster-related damages later. Cost-effectiveness analysis evaluates how best to spend a given amount of money to achieve a specific goal. Determining the economic feasibility of mitigating natural hazards provides decision makers with an understanding of the potential benefits and costs of an activity, as well as a basis upon which to compare alternative projects. Figure 5.2 shows decision criteria for selecting the appropriate method of analysis.

Figure 5.2 Benefit Cost Decision Criteria



Source: Community Service Center's Oregon Natural Hazards Workgroup at the University of Oregon, 2006

If the activity will be funded through any Federal Emergency Management Agency (FEMA) funding sources, then the coordinating body must use a FEMA-approved cost-benefit analysis tool to evaluate the appropriateness of the activity. A project must have a benefit/cost ratio of greater than one in order to be eligible for FEMA grant funding.

For non-federally funded or nonstructural projects, a qualitative assessment will be completed to determine the project's cost effectiveness. The coordinating body will use a multivariable assessment technique called STAPLE/E to prioritize these actions. STAPLE/E stands for Social, Technical, Administrative, Political, Legal, Economic, and Environmental. Assessing projects based upon these seven variables can help define a project's qualitative cost effectiveness. The STAPLE/E technique has been tailored for use in natural hazard action item prioritization by the Partnership for Disaster Resilience at the University of Oregon's Community Service Center.

Three-Year Review of Plan

As an addendum to the State of Oregon Natural Hazard Mitigation Plan, this plan will need to be updated every three years in accordance with the update schedule outlined in the Disaster Mitigation Act of 2000. During the plan update, the following questions should be asked to determine what actions are necessary to update the plan. The Plan Coordinator will be responsible for assembling the Steering Committee to address the questions outlined below.

- Are the plan goals still applicable?
- Do the plan's priorities align with State priorities?

- Are there new departments, units, or partners that should be brought to the table?
- Is there new university, local, regional, state, or federal policies influencing natural hazards that should be addressed?
- Has the university successfully implemented any mitigation activities since the plan was last updated?
- Have new issues or problems related to hazards been identified in the university?
- Do existing actions need to be reprioritized for implementation?
- Are the actions still appropriate given current resources?
- Have there been any changes in the university's footprint that could influence the effects of hazards?
- Are there new studies or data available that would enhance the risk assessment?
- Has the university been affected by any disasters? Did the plan accurately address the impacts of this event?

The questions above will help the Committee determine what components of the mitigation plan need updating. They will be responsible for updating any deficiencies found in the plan.

Continued Campus and Public Input

The university is dedicated to involving the campus directly in the continual reshaping and updating of the Natural Hazard Mitigation Plan. Therefore, portions of the plan will be placed on the university web-site allowing university community members to view the plan and provide feedback. The success of the plan's implementation partially relies on the campus community's interest and willingness to become involved in natural hazard mitigation. Their willingness to become involved relies on the visibility and campus community's understanding of the issue before any behavioral change happens. There are action items directly related to public involvement have been included in the plan. They are:

- Durign the plan updatign phase announcements will be posted on the University website encouraging public comment.
- The University will partner with the Enviornmental Science program elliciting public feedback from these students.
- Feedback will be requested from City of Ashland Emergency Manager, Ashland Fire Department, Jackson County Emergency Manager, and Rogue Cooomunity College.
- Anannoucement will be placed in the University newspaper requesting public comment regardign the plan.