

## 2009 Academic Excellence Showcase Planning Documents

Please return all three parts **ELECTRONICALLY** to **Jeff Templeton** (NS 211, ph: 8-8858, email: templej@wou.edu) **NO LATER THAN** Monday, May 4, 2009

### Part 1: Session Planning and Scheduling Form

Session Chair(s): **Dr. Steve Taylor, Earth and Physical Sciences Department**

Session Title: **"Earthquake Hazards and Risk Mitigation in Western Washington and Oregon"**

Session Format (e.g., symposium, performances): **Theme-Based Poster Session**

Session Length: 2 Hours

Preferred Session Time:

(for additional information, please refer to session guidelines at <http://www.wou.edu/showcase>):

*For Symposia, Creative Arts, or Panel Discussion Sessions:*

☐ morning (8:30-11:30)    ☐ afternoon (1:00-4:00)    ☐ other (specify time) \_\_\_\_\_

*For Poster Sessions:*

☐ morning (9:00-11:00)    ☒ mid-day (11:30-1:30)    ☐ afternoon (2:00-4:00)

Room Request:

1<sup>st</sup> Choice **Werner Poster Room**    2<sup>nd</sup> Choice \_\_\_\_\_    3<sup>rd</sup> Choice \_\_\_\_\_    ☐ No Preference

Session Aides (e.g., student assistants to distribute attendance "tickets", distribute session materials, etc.):

☐ Yes, I would like a session aide    ☐ No, I don't need an aide

☒ I already have an aide. He/she is: **ES473 Students**

**Note:** If any of presenters have a disability that requires accommodation, please have them contact the Office of Disability Services for coordination of his/her needs. They should allow for at least 72 hours notice for services to be coordinated. The Office of Disability Services can be reached by calling 503-838-8250 (TTY, Voice).

**Part 2: Session Organization Form** ***NOTE FROM SESSION CHAIR – This is a threaded theme session. Please list the following abstracts/titles in the program guide as ordered below.***

Presentation Time (e.g., 9:15 – 9:30)	11:30-1:30
Faculty Presenter's Name:	Dr. Steve Taylor
Faculty Sponsor:	Dr. Steve Taylor
Presentation Title:	"Overview of Earthquake Hazards and Risk Reduction in Western Washington and Oregon"
Audio/Visual Requests:	Poster Display Space / Easel
Notes/Special Requests	Frosty Cold All-Grain Natural Beverages

Presentation Time (e.g., 9:15 – 9:30)	11:30-1:30
Student Presenter's Name:	Ben Shivers
Faculty Sponsor:	Dr. Steve Taylor
Presentation Title:	"Geologic Framework and Tectonic Setting of the Pacific Northwest"
Audio/Visual Requests:	Poster Display Space / Easel
Notes/Special Requests	Frosty Cold All-Grain Natural Beverages

Presentation Time (e.g., 9:15 – 9:30)	11:30-1:30
Student Presenter's Name:	Pat Stephenson
Faculty Sponsor:	Dr. Steve Taylor
Presentation Title:	"Overview of Bedrock and Surficial Geology of the Pacific Northwest"
Audio/Visual Requests:	Poster Display Space / Easel
Notes/Special Requests	Frosty Cold All-Grain Natural Beverages

Presentation Time (e.g., 9:15 – 9:30)	11:30-1:30
Student Presenter's Name:	Janelle Anzalone
Faculty Sponsor:	Dr. Steve Taylor
Presentation Title:	"Cascadia Subduction Processes and Earthquake Hazards"
Audio/Visual Requests:	Poster Display Space / Easel
Notes/Special Requests	Frosty Cold All-Grain Natural Beverages

Presentation Time (e.g., 9:15 – 9:30)	11:30-1:30
Student Presenter's Name:	Matt Moore
Faculty Sponsor:	Dr. Steve Taylor
Presentation Title:	"Intraplate Crustal Faulting and Earthquake Sources in the Pacific Northwest"
Audio/Visual Requests:	Poster Display Space / Easel
Notes/Special Requests	Frosty Cold All-Grain Natural Beverages

Presentation Time (e.g., 9:15 – 9:30)	11:30-1:30
Student Presenter's Name:	Ryan Stanley
Faculty Sponsor:	Dr. Steve Taylor
Presentation Title:	"Historic Seismicity, Neotectonics and Active Faulting in Washington and Oregon"
Audio/Visual Requests:	Poster Display Space / Easel
Notes/Special Requests	Frosty Cold All-Grain Natural Beverages

Presentation Time (e.g., 9:15 – 9:30)	11:30-1:30
Student Presenter's Name:	Thomas Van Nice
Faculty Sponsor:	Dr. Steve Taylor
Presentation Title:	"Earthquake Risks I: Ground Shaking Hazards in Oregon"
Audio/Visual Requests:	Poster Display Space / Easel
Notes/Special Requests	Frosty Cold All-Grain Natural Beverages

Presentation Time (e.g., 9:15 – 9:30)	11:30-1:30
Student Presenter's Name:	James McLeod
Faculty Sponsor:	Dr. Steve Taylor
Presentation Title:	"Earthquake Risks II: Co-seismic Landslides in Western Washington and Oregon"
Audio/Visual Requests:	Poster Display Space / Easel
Notes/Special Requests	Frosty Cold All-Grain Natural Beverages

Presentation Time (e.g., 9:15 – 9:30)	11:30-1:30
Student Presenter's Name:	Amanda Tondreau
Faculty Sponsor:	Dr. Steve Taylor
Presentation Title:	"Earthquake Risks III: Liquefaction Potential in the Willamette-Puget Lowland"
Audio/Visual Requests:	Poster Display Space / Easel
Notes/Special Requests	Frosty Cold All-Grain Natural Beverages

Presentation Time (e.g., 9:15 – 9:30)	11:30-1:30
Student Presenter's Name:	Keoni Wong
Faculty Sponsor:	Dr. Steve Taylor
Presentation Title:	"Earthquake Mitigation I: Techniques for Reducing Earthquake Hazards"
Audio/Visual Requests:	Poster Display Space / Easel
Notes/Special Requests	Frosty Cold All-Grain Natural Beverages

Presentation Time (e.g., 9:15 – 9:30)	11:30-1:30
Student Presenter's Name:	Gerritt Vincent
Faculty Sponsor:	Dr. Steve Taylor
Presentation Title:	"Earthquake Mitigation II: Loss Potential, Preparedness, Risk Reduction and Recovery"
Audio/Visual Requests:	Poster Display Space / Easel
Notes/Special Requests	Frosty Cold All-Grain Natural Beverages

Presentation Time (e.g., 9:15 – 9:30)	11:30-1:30
Student Presenter's Name:	Brad Adams
Faculty Sponsor:	Dr. Steve Taylor
Presentation Title:	"Regional Case Study I: Seismic Hazards in the Seattle Area"
Audio/Visual Requests:	Poster Display Space / Easel
Notes/Special Requests	Frosty Cold All-Grain Natural Beverages

Presentation Time (e.g., 9:15 – 9:30)	11:30-1:30
Student Presenter's Name:	DJ Jaeger
Faculty Sponsor:	Dr. Steve Taylor
Presentation Title:	"Regional Case Study II: Seismic Hazards in the Tacoma Area"
Audio/Visual Requests:	Poster Display Space / Easel
Notes/Special Requests	Frosty Cold All-Grain Natural Beverages

Presentation Time (e.g., 9:15 – 9:30)	11:30-1:30
Student Presenter's Name:	Alyssa Pratt
Faculty Sponsor:	Dr. Steve Taylor
Presentation Title:	"Regional Case Study III: Seismic Hazards in the Portland Area"
Audio/Visual Requests:	Poster Display Space / Easel
Notes/Special Requests	Frosty Cold All-Grain Natural Beverages

Presentation Time (e.g., 9:15 – 9:30)	11:30-1:30
Student Presenter's Name:	Sarah Johnson
Faculty Sponsor:	Dr. Steve Taylor
Presentation Title:	"Regional Case Study IV: Seismic Hazards in the Mid-Willamette Valley"
Audio/Visual Requests:	Poster Display Space / Easel
Notes/Special Requests	Frosty Cold All-Grain Natural Beverages

Presentation Time (e.g., 9:15 – 9:30)	11:30-1:30
Student Presenter's Name:	Gretchen Boyer
Faculty Sponsor:	Dr. Steve Taylor
Presentation Title:	"Regional Case Study V: Seismic Hazards in the Klamath Falls Area"
Audio/Visual Requests:	Poster Display Space / Easel
Notes/Special Requests	Frosty Cold All-Grain Natural Beverages

Presentation Time (e.g., 9:15 – 9:30)	
Student Presenter's Name:	
Faculty Sponsor:	
Presentation Title:	
Audio/Visual Requests:	
Notes/Special Requests	

Presentation Time (e.g., 9:15 – 9:30)	
Student Presenter's Name:	
Faculty Sponsor:	
Presentation Title:	
Audio/Visual Requests:	
Notes/Special Requests	

**Part 3: Template PROPOSAL TO PRESENT Form** *NOTE FROM SESSION CHAIR – This is a threaded theme session. Please list the following abstracts/titles in the program guide as ordered below. NOTE 2: the paragraph breaks are included by design, and should be maintained in the final published abstract volume.*

Session Title: “Earthquake Hazards and Risk Mitigation in Western Washington and Oregon”  
*Poster 1*

Your Name: Dr. Taylor                      Phone No.: 8-8398                      Email: [taylors@wou.edu](mailto:taylors@wou.edu)  
Title of your Presentation: “Overview of Earthquake Hazards and Risk Reduction in Western Washington and Oregon”

Abstract (100 word limit) or Photograph of Art Work (3” X 5” limit):

This theme session involves presentation by 15 WOU Earth Science students enrolled in ES473 Environmental Geology, spring term 2009. The focus of the session is on earthquake hazards and risk reduction in western Washington and Oregon.

The Pacific Northwest is a tectonically active region comprised of complex fault systems in association with the Cascadia subduction zone. Earthquakes are regularly-occurring geologic phenomena associated with these types of tectonic settings. Since a majority of the population in the Pacific Northwest lives in the Puget-Willamette Lowland (I-5 Corridor) of Washington and Oregon, subduction-related seismicity presents a persistent risk to the socio-economic infrastructure of the region. This theme session provides an assessment of the hazards, risks and mitigation techniques necessary to prepare for potentially catastrophic earthquake events in the near future. The range of topics include: the regional geologic and tectonic framework, the Cascadia megathrust system, intraplate crustal faulting, historic seismicity and fault rupture, ground-shaking hazards, co-seismic landsliding, liquefaction, earthquake preparedness and risk reduction, and site-specific case studies of seismic hazards in Seattle, Tacoma, Portland, the mid-Willamette Valley, and Klamath Falls.

Session Format (e.g., Presentation, Performance, Poster): **Poster**

Length of Presentation: **2 Hours**

Audio Visual Requests: **Poster Presentation Space and Easels**

Your Faculty Sponsor: **Dr. Steve Taylor**

Major: Geology

Current Academic Standing (FR, SO, JR, SR): Faculty

Home Town: Monongahela, PA

High School: Ringgold

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**THIS FORM, AND AN ELECTRONIC COPY OF THE ABSTRACT AND/OR PHOTOGRAPH, ARE DUE TO \_\_{SESSION CHAIR NAME}\_ NO LATER THAN \_\_\_\_\_, 2009**

### **Part 3: Template PROPOSAL TO PRESENT Form**

Session Title: **"Earthquake Hazards and Risk Mitigation in Western Washington and Oregon"**

#### ***Poster 2***

Your Name: Ben Shivers

Phone No.:

Email: bshivers05@wou.edu

Title of your Presentation: **"Geologic Framework and Tectonic Setting of the Pacific Northwest"**

Abstract (100 word limit) or Photograph of Art Work (3" X 5" limit):

The Pacific Northwest is a tectonically active region comprised of complex fault systems in association with the Cascadia subduction zone. The tectonic setting is characterized by a long history of oblique convergence of the Juan de Fuca plate beneath North America. Subduction processes are manifested in the Pacific Northwest by an offshore trench, accretionary Coast Range complex, Puget-Willamette lowland, and Cascade Volcanic arc.

Seismicity in the region is driven by an assortment of stress regimes that are propagated via faults in the underlying bedrock. Earthquakes are triggered by movement along these fault systems and the hazards associated with the Northwest include ground shaking, liquefaction, landslides, structural damage and tsunamis. Many quakes in this region stem from shallow-crustal fault movement and deep-intraplate fault movement, both of which commonly produce earthquake magnitudes of 5.0-7.0 with recurrence intervals between 10-30 years. Primary concerns now focus upon a catastrophic 9.0 magnitude earthquake centered within the 800 mile long Cascadia subduction zone. Research places seismic recurrence intervals along the subduction zone between 300-500 years with the last Cascadia quake occurring January 26, 1700 off the coast of Oregon.

Session Format (e.g., Presentation, Performance, Poster): **Poster**

Length of Presentation: **2 Hours**

Audio Visual Requests: **Poster Presentation Space and Easels**

Your Faculty Sponsor: **Dr. Steve Taylor**

Major: Earth Science

Current Academic Standing (FR, SO, JR, SR): SR

Home Town:

High School:

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### **Part 3: Template PROPOSAL TO PRESENT Form**

Session Title: **"Earthquake Hazards and Risk Mitigation in Western Washington and Oregon"**

#### ***Poster 3***

Your Name: Pat Stephenson

Phone No.: 503-881-1618

Email: pstephe@wou.edu

Title of your Presentation: **"Overview of Bedrock and Surficial Geology of the Pacific Northwest"**

Abstract (100 word limit) or Photograph of Art Work (3" X 5" limit):

Topographically constrained by the Cascade Mountain Range to the east and Oregon Coast Range to the west, the Willamette River basin represents a forearc depositional environment in the Cascadia subduction zone. Sediment deposition varies through time depending on the morphology of the river system, punctuated by localized volcanism. Long-term Tertiary and Quaternary depositional processes have resulted in complex stratigraphy, with interbedded sedimentary and volcanic strata.

Similar to the Willamette Valley, the Puget Lowland receives drainage from the Washington Cascade Mountains, Washington Coast Range, and Olympic Mountains on the north end of the Olympic Peninsula. The Puget Lowlands form a narrow gap between the confining mountain ranges and is underlain by a wide variety of materials, including poorly sorted fluvial deposits, lahar deposits, and formations of glacial till and outwash. The combination of older consolidated bedrock at depth, and overlying surficial sediments, establishes the geologic framework upon which to assess the potential for seismic-related hazards in western Oregon and Washington.

Session Format (e.g., Presentation, Performance, Poster): **Poster**

Length of Presentation: **2 Hours**

Audio Visual Requests: **Poster Presentation Space and Easels**

Your Faculty Sponsor: **Dr. Steve Taylor**

Major: Earth Science

Current Academic Standing (FR, SO, JR, SR): SR

Home Town: Tillamook, Oregon

High School: Tillamook High School

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### **Part 3: Template PROPOSAL TO PRESENT Form**

Session Title: **"Earthquake Hazards and Risk Mitigation in Western Washington and Oregon"**

#### ***Poster 4***

Your Name: Janelle Anzalone

Phone No.: Email: jillianof9@yahoo.com

Title of your Presentation: **"Cascadia Subduction Processes and Earthquake Hazards"**

Abstract (100 word limit) or Photograph of Art Work (3" X 5" limit):

Prior decades of scientific research document the potential for a great megathrust earthquake on the Oregon coast due to subduction of the Juan De Fuca Plate beneath North America. The initial research questions have progressed from "if?" to "when and how big?" This paper will present paleosiesmic and subsurface geologic data that suggest a strong possibility for a large magnitude Cascadia earthquake in the near future.

Evidence for regional earthquake activity includes neotectonic uplift, tsunami deposits, coastal submergence of wave-cut coastal benches, burial of previously vegetated lowlands and tidal flats, tree ring and carbon dating, and sedimentary structures indicative of ground shaking. All findings support an extensive and regular history of megathrust events, the last of which occurred in January 1700. Upon analysis of the data, it appears that we are in fact on track to experience a great earthquake "starting yesterday".

Session Format (e.g., Presentation, Performance, Poster): **Poster**

Length of Presentation: **2 Hours**

Audio Visual Requests: **Poster Presentation Space and Easels**

Your Faculty Sponsor: **Dr. Steve Taylor**

Major: Earth Science

Current Academic Standing (FR, SO, JR, SR): SR

Home Town: Falls City, Oregon

High School:

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### **Part 3: Template PROPOSAL TO PRESENT Form**

Session Title: **"Earthquake Hazards and Risk Mitigation in Western Washington and Oregon"**

*Poster 5*

Your Name: Matt Moore

Phone No.:

Email: matthewtms@gmail.com

Title of your Presentation: **"Intraplate Crustal Faulting and Earthquake Sources in the Pacific Northwest"**

Abstract (100 word limit) or Photograph of Art Work (3" X 5" limit):

Intraplate crustal faulting is a result of active tectonic motion in the Pacific Northwest. Seismic analysis indicates that fault depths can extend 15 km, or deeper, into the earth's crust. Unlike Cascadia megathrust slip events, these types of structures rupture quite frequently, usually with low magnitudes (M 1 to 2) that are only observed by seismographs. Despite the low magnitudes of the average crustal fault earthquake, they periodically produce sizeable events capable of causing considerable shaking and damage. The Scotts Mills Earthquake of 1962 (M 5.5), the Spring Break Earthquake of 1993 (M 5.6), and late Holocene evidence of a M-7.0 event along the Tacoma Fault Zone are examples.

Different types of crustal faults are associated with varying stress regimes across the Pacific Northwest. The region extending from northwestern Oregon to Puget Sound, is characterized by northwest-striking reverse faults. In contrast, southeast and central Oregon is associated with Late Cenozoic normal faults that are generally oriented to the north-northeast. Due to extensive surficial cover and vegetation in the western portions of Washington and Oregon, many surface faults have remained undetected. Recent advances with LIDAR (Light Distance and Ranging) technology have permitted identification of previously hidden scarps, giving a more detailed perspective on intraplate faulting in the Pacific Northwest.

Session Format (e.g., Presentation, Performance, Poster): **Poster**

Length of Presentation: **2 Hours**

Audio Visual Requests: **Poster Presentation Space and Easels**

Your Faculty Sponsor: **Dr. Steve Taylor**

Major: Earth Science

Current Academic Standing (FR, SO, JR, SR): JR

Home Town: Salem, OR

High School:

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### **Part 3: Template PROPOSAL TO PRESENT Form**

Session Title: **"Earthquake Hazards and Risk Mitigation in Western Washington and Oregon"**

#### ***Poster 6***

Your Name: Ryan Stanley

Phone No.:

Email: rstanley06@wou.edu

Title of your Presentation: **"Historic Seismicity, Neotectonics and Active Faulting in Oregon"**

Abstract (100 word limit) or Photograph of Art Work (3" X 5" limit):

Evidence of active faulting and seismicity in the Pacific Northwest has been documented through analysis of stratigraphic relationships and use of modern instrumentation. Crustal, intraplate, and subduction zone earthquakes represent three types of Cascadia deformation, each with unique seismic characteristics. Earthquake monitoring utilizes specialized instruments that collect information to understand sizes, locations, frequency of occurrence, and types of earthquakes. Written documentation of historical events did not appear in Oregon until the 1840s, and seismograph stations were not established in the Pacific Northwest until 1906.

The discovery of multiple buried soils in coastal intertidal lowlands suggests that great megathrust earthquakes have repeatedly occurred within the Cascadia subduction zone. Multiple lines of evidence indicate an average megathrust earthquake recurrence interval of ~500 years, with the most recent occurring A.D. 1700. Since 1841 more than 6,000 earthquakes have occurred in Oregon. Oregon's largest earthquakes include the 1873 Crescent City, 1936 Milton-Freewater, 1962 Portland, 1993 Scotts Mills, and 1993 Klamath Falls earthquakes. This paper provides a synopsis of historic seismicity and seismic sources in Oregon, with implications for hazard planning throughout the state.

Session Format (e.g., Presentation, Performance, Poster): **Poster**

Length of Presentation: **2 Hours**

Audio Visual Requests: **Poster Presentation Space and Easels**

Your Faculty Sponsor: **Dr. Steve Taylor**

Major: Earth Science

Current Academic Standing (FR, SO, JR, SR): JR-SR

Home Town: Salem, OR

High School:

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### **Part 3: Template PROPOSAL TO PRESENT Form**

Session Title: **“Earthquake Hazards and Risk Mitigation in Western Washington and Oregon”**

*Poster 7*

Your Name: Thomas Van Nice

Phone No.:

Email: tom\_\_v@hotmail.com

Title of your Presentation: **“Earthquake Risks I: Ground Shaking Hazards in Oregon”**

Abstract (100 word limit) or Photograph of Art Work (3” X 5” limit):

Earthquakes are one of the most powerful natural disasters that occur in the world. Ground motion and shaking during an earthquake can be detected hundreds of miles away from the source. The ground motion and shaking that accompany an earthquake are produced by the waves that are a result of the motion derived from brittle failure of consolidated rock materials. There are three main types of waves, S-waves, P-waves, and surface waves, each of which results in different styles of ground motion. The intensity and the duration of the shaking will be determined by the amount of energy released during the earthquake event. The strength of an earthquake is measured from seismograms using a moment-magnitude calculation (e.g. Richter scale). Earthquakes with magnitudes 3.0 and above can be felt by humans depending on material mechanics and other variables. Shaking and ground motion are associated with a significant portion of infrastructure damage and resulting deaths in an earthquake event.

Ground-motion modeling is used to construct seismic hazards maps in the Pacific Northwest. Critical input parameters include seismic sources, wave travel paths, and composition of subsurface materials. This project focuses on ground-shaking processes and hazards mapping in western Oregon.

Session Format (e.g., Presentation, Performance, Poster): **Poster**

Length of Presentation: **2 Hours**

Audio Visual Requests: **Poster Presentation Space and Easels**

Your Faculty Sponsor: **Dr. Steve Taylor**

Major: Earth Science

Current Academic Standing (FR, SO, JR, SR): JR-SR

Home Town:

High School:

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### **Part 3: Template PROPOSAL TO PRESENT Form**

Session Title: **"Earthquake Hazards and Risk Mitigation in Western Washington and Oregon"**

*Poster 8*

Your Name: James McLeod

Phone No.:

Email: jmcleod@wou.edu

Title of your Presentation: **"Earthquake Risks II: Co-seismic Landslides in Western Washington and Oregon"**

Abstract (100 word limit) or Photograph of Art Work (3" X 5" limit):

Co-seismic landslides are associated with significant infrastructure damage and human casualties in earthquake-prone areas of the world. These types of mass-wasting processes are induced by the ground movement associated with earthquakes. Factors contributing to co-seismic landslides include slope gradient and water-saturation state of surface materials. Correlating historic co-seismic landslide data in the Pacific Northwest with those from similar geologic terrains elsewhere enable better prediction of slope failure during future Cascadia earthquake events.

Evidence of past co-seismic landslides is commonly hidden by overlying sediment and vegetation, or has been removed over time by erosion. As western Washington and Oregon have become more populated over the past several decades, the risks of earthquake-related losses are greater than at any time in the past. By examining records and using new technologies like LIDAR, researchers are better able to predict where co-seismic landslides will occur in the future and prevent loss of life. This paper examines trigger mechanisms for seismically induced landslides and provides an overview of hazard-prone localities in the Pacific Northwest.

Session Format (e.g., Presentation, Performance, Poster): **Poster**

Length of Presentation: **2 Hours**

Audio Visual Requests: **Poster Presentation Space and Easels**

Your Faculty Sponsor: **Dr. Steve Taylor**

Major: Earth Science

Current Academic Standing (FR, SO, JR, SR): SR

Home Town:

High School:

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### **Part 3: Template PROPOSAL TO PRESENT Form**

Session Title: **"Earthquake Hazards and Risk Mitigation in Western Washington and Oregon"**

#### ***Poster 9***

Your Name: Amanda Tondreau

Phone No.:

Email: atondreau06@wou.edu

Title of your Presentation: **"Earthquake Risks III: Liquefaction Potential in the Willamette-Puget Lowland"**

Abstract (100 word limit) or Photograph of Art Work (3" X 5" limit):

Liquefaction is an earthquake-related hazard that causes unstable land and poses risks to building infrastructure in urban areas. Saturated sediments, ranging from gravel to silt, are more prone to liquefaction during an earthquake compared to those that are unsaturated and well drained. Unconsolidated sediments deposited within the last 10,000 years, during the Holocene era, are particularly vulnerable to liquefaction in the Willamette-Puget Lowland.

Liquefaction processes commonly result in buried pipelines and other objects floating to the surface, and commonly cause foundational failure in roads and buildings. Analysis of paleo-liquefaction features preserved in the geologic record provides a technique that allows use of past events to predict future risks of damage. This paper focuses on geotechnical aspects of seismically-induced liquefaction hazards in western Washington and Oregon.

Session Format (e.g., Presentation, Performance, Poster): **Poster**

Length of Presentation: **2 Hours**

Audio Visual Requests: **Poster Presentation Space and Easels**

Your Faculty Sponsor: **Dr. Steve Taylor**

Major: Earth Science

Current Academic Standing (FR, SO, JR, SR): JR

Home Town:

High School:

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### **Part 3: Template PROPOSAL TO PRESENT Form**

Session Title: **“Earthquake Hazards and Risk Mitigation in Western Washington and Oregon”**

**Poster 10**

Your Name: Keoni Wong

Phone No.:

Email: kkwong06@wou.edu

Title of your Presentation: **“Earthquake Mitigation I: Techniques for Reducing Earthquake Hazards”**

Abstract (100 word limit) or Photograph of Art Work (3” X 5” limit):

Earthquakes are unequivocal. Emergency planning and implementing strategies to prevent loss of life and property is the only real way to be ready for when an earthquake hits. Identifying hazard-prone areas, preparing development plans, reinforcing failure-prone buildings, and public outreach are some techniques used to reduce earthquake hazards and potentially save lives. Once these protocols are established, and risk models are developed, planners and decision-makers can use this information to guide modification of building codes to make sure that all roads, offices, residential areas are modernized and ready to withstand earthquake motion. These hazard-mitigation techniques are necessary to reduce the risk to human life and property, potentially saving regional governments billions of dollars in losses should an earthquake ever occur. This paper focuses on earthquake mitigation techniques that are currently employed in the Pacific Northwest.

Session Format (e.g., Presentation, Performance, Poster): **Poster**

Length of Presentation: **2 Hours**

Audio Visual Requests: **Poster Presentation Space and Easels**

Your Faculty Sponsor: **Dr. Steve Taylor**

Major:

Current Academic Standing (FR, SO, JR, SR): JR-SR

Home Town:

High School:

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### **Part 3: Template PROPOSAL TO PRESENT Form**

Session Title: **"Earthquake Hazards and Risk Mitigation in Western Washington and Oregon"**

#### ***Poster 11***

Your Name: Gerritt Vincent      Phone No.:      Email: gvincent06@wou.edu

Title of your Presentation: **"Earthquake Mitigation II: Loss Potential, Preparedness, Risk Reduction, and Recovery"**

Abstract (100 word limit) or Photograph of Art Work (3" X 5" limit):

Earthquakes are hazardous to people and the economy. Potential loss impacts include lives, homes, office buildings, manufacturing plants, schools, port facilities, and transportation infrastructure. Urban development in active tectonic settings, such as the Pacific Northwest, is fraught with risk, therefore earthquake education, outreach, and planning are necessary to minimize damage and establish recovery plans. People living in areas where earthquakes exist must understand pre- and post-earthquake issues.

This paper focuses on shaking-related hazards associated with western Oregon. Topics include expected financial loss, building damage scenarios, and the casualty risks associated with severe earthquake events. Emphasis is placed on public awareness, earthquake-related legislation, site-specific seismic-hazard investigations, and organizational strategies that target risk reduction (e.g. Cascadian Region Earthquake Workgroup-CREW). By understanding seismic mechanisms and planning for the affects of severe earthquakes, Oregonians can better prepare for disaster recovery.

Session Format (e.g., Presentation, Performance, Poster): **Poster**

Length of Presentation: **2 Hours**

Audio Visual Requests: **Poster Presentation Space and Easels**

Your Faculty Sponsor: **Dr. Steve Taylor**

Major: Communications, Earth Science Minor

Current Academic Standing (FR, SO, JR, SR): JR-SR

Home Town:

High School:

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### **Part 3: Template PROPOSAL TO PRESENT Form**

Session Title: **“Earthquake Hazards and Risk Mitigation in Western Washington and Oregon”**

**Poster 12**

Your Name: Brad Adams

Phone No.:

Email: badams@wou.edu

Title of your Presentation: **“Regional Case Study I: Seismic Hazards in the Seattle Area”**

Abstract (100 word limit) or Photograph of Art Work (3” X 5” limit):

Detection of active faults and seismic hazards in the Seattle area is problematic, owing to thick surficial deposits and abundant vegetative cover. Aeromagnetic mapping techniques have given insight into this once enigmatic area. The Seattle fault zone is segmented and comprised of several east-trending, north-verging splays along a reverse-thrust system. Three distinct magnetic anomalies are associated with the fault zone, and in combination with regional stratigraphic records, help elucidate seismic history in the area.

The fault has been active from 40 Ma to the present, with a major M 7 earthquake occurring 1,100 years ago. The Seattle area is prone to co-seismic ground failure such as that associated with the Olympia 1949 and Seattle-Tacoma 1983 earthquakes. In 2001, the Nisqually event yielded a M 6.5 tremor that was felt as far south as Salem. The Nisqually earthquake had a similar hypocenter to that of the 1949 Puget Sound event. The area has been associated with widespread liquefaction processes during past earthquakes. The expansion of urban development in the Seattle area over the past two decades has significantly increased the risk of widespread, catastrophic damage when the next seismic event occurs. This paper presents a summary of past seismic activity in the Seattle area and risk potential for catastrophic earthquakes in the future.

Session Format (e.g., Presentation, Performance, Poster): **Poster**

Length of Presentation: **2 Hours**

Audio Visual Requests: **Poster Presentation Space and Easels**

Your Faculty Sponsor: **Dr. Steve Taylor**

Major:

Current Academic Standing (FR, SO, JR, SR):

Home Town:

High School:

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### **Part 3: Template PROPOSAL TO PRESENT Form**

Session Title: **"Earthquake Hazards and Risk Mitigation in Western Washington and Oregon"**

**Poster 13**

Your Name: DJ Jaeger

Phone No.:

Email: djaeger06@gmail.com

Title of your Presentation: **"Regional Case Study II: Seismic Hazards in the Tacoma Area"**

Abstract (100 word limit) or Photograph of Art Work (3" X 5" limit):

The Tacoma area has many fault scarps that are visible in LIDAR-based elevation models. LIDAR uses aerial surveying techniques to pulse a laser, reflect it from the ground surface, and measure the return time. These techniques are used to map locations of fault scarps and changes in ground elevation due to active tectonic stress fields.

Puget Sound has a large concentration of fault scarps, providing evidence of neotectonic activity and active surface deformation. Detailed mapping of scarps helps define the seismic hazards that faults pose, including the magnitude and frequency of past earthquakes. Tacoma has experienced many high-magnitude earthquakes in the past, as well as related tsunami inundation of low-lying tidal areas. There is great need to address these hazards and predict future events to mitigate the potential for major destruction. This paper focuses on the seismic history and fault patterns associated with the southern Puget Sound region, with implications for hazards management in Tacoma.

Session Format (e.g., Presentation, Performance, Poster): **Poster**

Length of Presentation: **2 Hours**

Audio Visual Requests: **Poster Presentation Space and Easels**

Your Faculty Sponsor: **Dr. Steve Taylor**

Major: English, Earth Science Minor

Current Academic Standing (FR, SO, JR, SR): SR

Home Town:

High School:

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### **Part 3: Template PROPOSAL TO PRESENT Form**

Session Title: **"Earthquake Hazards and Risk Mitigation in Western Washington and Oregon"**

**Poster 14**

Your Name: Alyssa Pratt

Phone No.:

Email: izzyp Pratt@hotmail.com

Title of your Presentation:

Abstract (100 word limit) or Photograph of Art Work (3" X 5" limit):

The Portland Metropolitan area faces seismic hazards not only from the Cascadia megathrust, but also from several crustal faults located within the vicinity. An example of the latter is the Portland Hills Fault, which extends 40-60 km in length, and dips southwest beneath the western portion of the city. Recent paleoseismic work indicates that this fault is capable of generating large-magnitude earthquakes ranging from M 6.8 to 7.2.

M-6.8 ground-shaking models of the Portland hills fault indicate that potential surface accelerations from an average rupture event would exceed comparable motions generated by a M 9.0 Cascadia-subduction event. These models support the hypothesis that regional crustal faults are potentially the most hazardous in western Oregon. In addition to shaking intensity, the widespread presence of unconsolidated Quaternary sediment tends to amplify ground motion and promote liquefaction. This paper presents a synopsis of potential fault triggers in the Portland area, and provides an overview of the geological data necessary to estimate damage potential.

Session Format (e.g., Presentation, Performance, Poster): **Poster**

Length of Presentation: **2 Hours**

Audio Visual Requests: **Poster Presentation Space and Easels**

Your Faculty Sponsor: **Dr. Steve Taylor**

Major: Earth Science

Current Academic Standing (FR, SO, JR, SR): JR

Home Town:

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### **Part 3: Template PROPOSAL TO PRESENT Form**

Session Title: **"Earthquake Hazards and Risk Mitigation in Western Washington and Oregon"**

*Poster 15*

Your Name: Sarah Johnson

Phone No.:

Email: seejohnnyangel@gmail.com

Title of your Presentation: **"Regional Case Study IV: Seismic Hazards in the Mid-Willamette Valley"**

Abstract (100 word limit) or Photograph of Art Work (3" X 5" limit):

The Willamette Valley is subjected to many hazards due to its geologic setting. Volcanic activity, landslides, floods, and earthquakes are all realistic considerations when living near an active plate boundary. Oregon and Washington are both located at the convergent zone of the North American and Juan de Fuca plates, with a long history of oblique subduction of the latter throughout the Cenozoic. This ongoing tectonic process generates magma in the Cascade arc and greatly influences the geologic structure of the Pacific Northwest.

Much of Oregon's diverse landscape, including the Mid-Willamette Valley, is due to Cascadia subduction processes. This forearc region has several fault zones that pass through, including the Mt Angel, the Canby-Molalla and the Gales Creek. These fault patterns are a manifestation of regional tectonic stress fields and are potential sources of crustal seismic activity. Historic seismicity, such as the 1993 earthquake, is an indicator that inland crustal faults in the mid-Willamette Valley are capable of causing widespread damage. This paper presents a summary of past seismic activity in the Willamette Valley and risk potential for catastrophic earthquakes in the future.

Session Format (e.g., Presentation, Performance, Poster): **Poster**

Length of Presentation: **2 Hours**

Audio Visual Requests: **Poster Presentation Space and Easels**

Your Faculty Sponsor: **Dr. Steve Taylor**

Major: Biology; Earth Science Minor

Current Academic Standing (FR, SO, JR, SR): SR

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### **Part 3: Template PROPOSAL TO PRESENT Form**

Session Title: **“Earthquake Hazards and Risk Mitigation in Western Washington and Oregon”**

**Poster 16**

Your Name: Gretchen Boyer

Phone No.:

Email: gboyer08@wou.edu

Title of your Presentation: **“Regional Case Study V: Seismic Hazards in the Klamath Falls Area”**

Abstract (100 word limit) or Photograph of Art Work (3” X 5” limit):

Mount Mazama and the Crater Lake caldera lies at the north end of the fault bounded basin that is known as the “Klamath Graben”. This structural low lies at the northwestern end of a set of complex northwest-trending fault-block mountains, located on the western edge of the Basin and Range province. The graben is bounded on the west and east sides by the active West Klamath Lake and East Klamath Lake fault zones, respectively. All of the above geologic factors pose significant seismic hazards, although historically the majority of earthquake epicenters occur within the Klamath graben proper. While both of the margin-bounding fault zones are active, there are more data available for the West Klamath Lake portion. These data provide the scientific framework that allows understanding of seismic hazards in the Klamath Falls area.

The West Klamath lake fault zone terminates to the south, near the epicenter of the September 1993 “Klamath Falls Earthquakes.” The two main shocks that struck the Klamath Falls area during that time registered magnitudes 5.9 and 6.0, causing landslides, significant building damage and two deaths. As a result of the 1993 earthquakes, closer seismic monitoring of the Klamath region was implemented in order to better understand the dynamics of fault activity. This paper focuses on earthquake mechanics and hazards monitoring programs associated with the Klamath Falls area.

Session Format (e.g., Presentation, Performance, Poster): **Poster**

Length of Presentation: **2 Hours**

Audio Visual Requests: **Poster Presentation Space and Easels**

Your Faculty Sponsor: **Dr. Steve Taylor**

Major: Biology; Environmental Studies Minor

Current Academic Standing (FR, SO, JR, SR): JR

Home Town:

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