Vanessa Alarcon

Geology 202

Outline for Term Paper

I. Introduction
   - A. Fundamental requirements for a glacier is that more snow accumulates in the winter than what melts in the summer
   - B. The Oregon Cascades started off as an ice cap
   - C. Glaciers are starting to melt and the warmth in climate is causing the receding of glaciers

II. Geologic Overview
   - A. Plate Tectonic
     - 1.Cascade Volcanic Arc
       - i. Along with Mount Rainier, Glacier Peak, Mount Baker, Lassen Peak, and Mount Shasta
       - ii. Located where the Juan de Fuca plate sub ducts under the North American Plate
     - 2. Volcanic Stratovolcano
       - i. Tall, conical volcano with a steep profile, layer of hardened lava, and volcanic ash
       - ii. Composed of andesitic rock
       - iii. Glaciers on northern side contain rock debris which is associated with frequent rock avalanches
       - iv. Southern Side has little to no rock debris on the ice
   - B. Glacial History
     - 1. Late Pleistocene (1.8 my to 10,000 yrs.): "Ice Age"
       - i. Ice cap covered Mount Hood
       - ii. Multiple episodes of lava domes and lava flows, pyroclastic flows, tephra falls, and lahars before, during, and just before last ice age (~ 15,000-30,000 yrs. ago)
     - 2.Holocene (over the last 10,000 yrs. to present)
       - i. Glaciers retreated during the warmer climate
       - ii. "Little Ice Age"- global cool period (700 yrs. ago to 150 yrs. ago), moraines identified
       - iii. Parkdale lava flow erupted in Middle Fork Hood river valley, Tephra fall form Crater Lake (~7,600 yrs. ago)
       - iv. Debris avalanche from upper south flank (~1,500 yrs. ago)
       - v. Steam explosions, minor tephra falls (1856-1865)

III. Active Glaciers

Jeremy Bione

ES 202

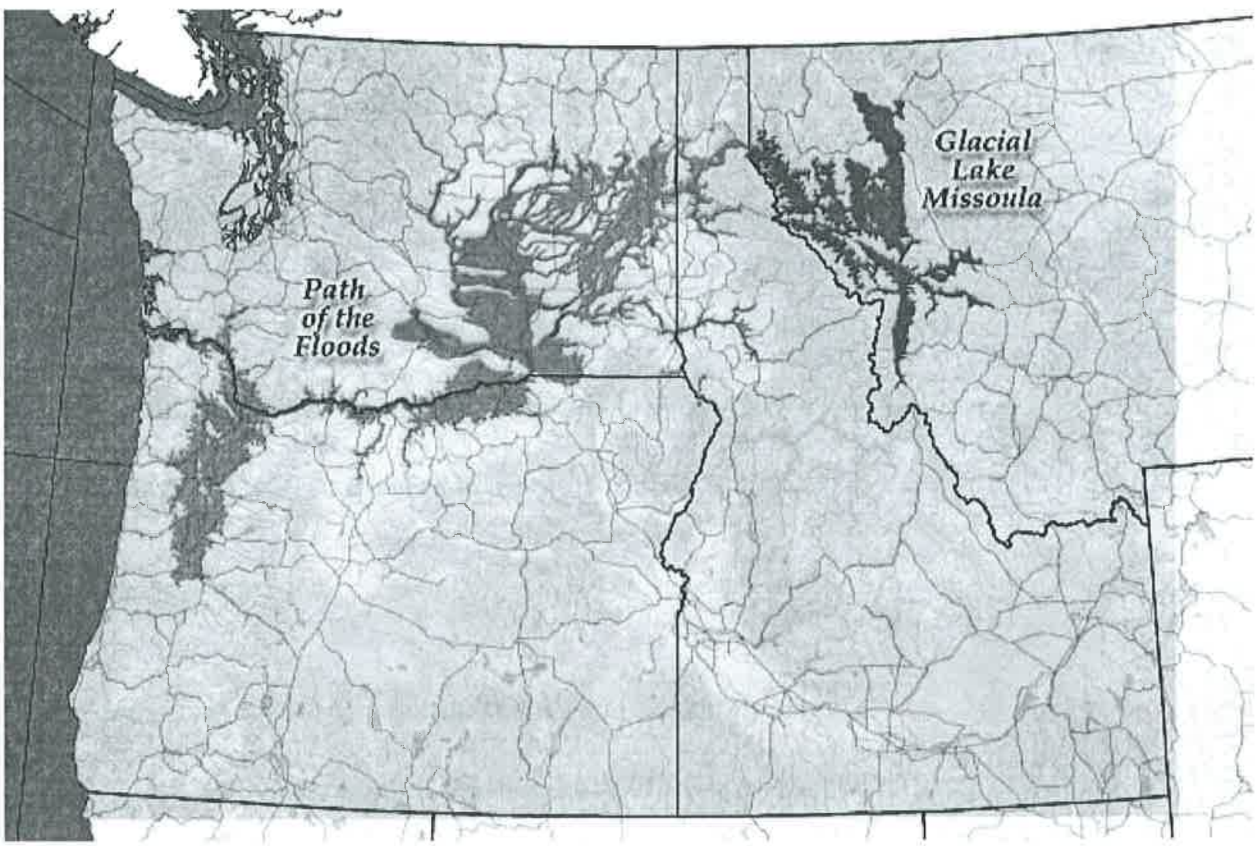
February 28, 2016

Final paper

5/6

Need some detail - missing details from reference readings

# Missoula Floods: Wiping the Slate Clean



Bethany Blancher

ES 202

Extended Outline

6/6

Looks Good ✓

# Flood Hazards of the Willamette Valley

I. Introduction

II. Geologic Overview
- A. Tectonic Setting
  - 1. Willamette Valley (area covered in this region)
    - a. Marion County (Salem)
    - b. Polk County (Dallas, Monmouth, Independence)
    - c. Benton County (Corvallis)
    - d. Linn County (Albany)
    - e. Lane County (Eugene, Springfield)
    - f. Yamhill Valley (Yamhill, Amity, McMinnville)
    - g. Mt. Hood Territory (Canby, Molalla, Wilsonville)
    - h. Cascades
    - i. Oregon Coast

III. Geologic History
- A. River Levels
  - 1. Rising
- B. Former Floods — High-magnitude floods
  - 1. Christmas Floods of 1964
    - a. The largest flood seen in this area at this time in history
  - 2. Flood of 1996
    - a. Comparable to the Christmas floods of 1964

IV. Flooding
- A. Causes
  - 1. Excessive Rainfall
    - a. Average rainfall in the Willamette Valley
    - b. Rainfall during floods
  - 2. Snow Melt
    - a. Contributes to flooding of lakes and rivers, especially in the Cascades
  - 3. Failure of Man-Made Structures
    - a. Dams are poorly designed and block drainage of excess water

Cesar Cardenas

1. Introduction
    a. Origen of the modern coastline
    b. Different types of erosions
    c. The time frame it takes for erosion to happen?
    d. What are the different erosion rates for different areas of the coast?
        i. Are they all constant?
        ii. Are they all different?
        iii. What are the factors that need to be considered for coastal erosion to take place?
2. Body
    a. Jump Off Joe
        i. Sea Stack-over 100 feet high
        ii. Eroded down over a period of 100 years.
        iii. The sandstone was Miocene in age.
    b. Beverly Beach
        i. Located 7 miles north of Jump Off Joe
        ii. Over a period of 13 years the beach eroded down from a gradual slope to a cliff side
        iii. The beach is made up of sand from the Astoria formation.
    c. Devil's Punchbowl
        i. Devil's Punchbowl is located west of Otter Rock.
        ii. Made of volcanic Breccia that cuts through the Astoria formation.
    d. - Neskowin to Nestucca Bay
        i. The beach between these two locations has a layer of basalt under it. Proposal rock near Neskowin is a sea stack that is made of basalt as well.
        ii. The Northern part of the beach between these locations has more sand than further south.
            1. This is a weird phenomenon due to the fact that beaches erode from north to south due to the north to south currents along the Oregon coast.
    e. Conclusino (Conclusion)
        i. El Nino/ La Nina events
            1. During these episodes the trade winds die down/slow down and the result is that the warm water on the western part of the pacific ocean flows back to the western North American coast.
                a. For example, Neskowin to Nestucca Bay
        ii. The type of material the beach or structure is made of has a direct influence on how it will erode.
            1. Sandstone/ Mudstone will erode faster than basalt.
        iii. Final conclusion
            1. All the different factors need to be considered for a given location on the Oregon coast because not all the locations have the same composition and El Nino/ La Nina will also affect how fast or how slow erosion will take place for that year.
            2. All locations in Oregon should have different erosion rates because of the factors mentioned above.

Emily Carlston

FOCUS TITLE

~~Implications of the Oregon~~ " Watershed ENHANCEMENT AND RIVER RESTORATION IN ~~OREGON~~ "WESTERN OREGON"

6/6

Introduction:

- Oregon's unique tectonic setting and how the rain shadow equal different climates
    - The differences between the coast range the Willamette valley and eastern Oregon
    - This is due to the rain shadow effect caused by our two mountain ranges
- Population spread in Oregon (majority of closely backed residents in the fertile Willamette valley)
    - What these means in an economic standpoint farm (farm land loss to urban spread)

Geological overview

- soil/ topography
    - Bedrock composition of mainly impermeable igneous rock, hard for aquifers even though it is cracked from flooding and glaciers
        - Talk about periods of glaciers and flooding
            - The last ice age
            - The Missoula floods
        - Talk in greater depth about volcanic setting and which volcanoes are active
            - The sear number means we have more igneous bedrock which can restrict water flow
            - The majority of volcanoes in Oregon are stratovolcanoes meaning they are both flow and explode
    - Most farmland soil deposited was in the Willamette valley where there is high range and high population


    - What is the solid made of what igneous rocks what made the topsoil good
        - Basalt and andesite as well as pyroclastic materials and what it means for porosity and permeability
        - What cracked the rock (glacier activity and weathering that is unique to the geographical positioning (temperate oceanic climates)
        - The Missoula floods and how it increased topsoil

## Geologic History and Coastal Erosions of Yaquina Bay
by Kolby Childers

Resources cited?? 5/6

- New paper & topics I gave you??

### Introduction

Yaquina Bay is located in Newport, along the coast of Oregon. The Miocene geologic events are recorded in the rock units that make up the coast range and the formations of the coast are still visible today. Yaquina Bay is rare to the unconformities that take place in Oregon where the Yaquina formation are located on both sides of the cascade range and the coastal erosion of the oregon is different than any other coast because of plate tectonics and the change in sea level.

### GEOLOGIC OVERVIEW

***tectonic setting***

Yaquina Bay are made up of the Nye Mudstone formation,Astoria formation, yaquina formation and columbia river basalts. active sea-floor spreading and oceanic plates beneath the NA plate shows evidence for marine sedimentary rock accretion and vertical land movement. subduction scraps off the oceanic sediment. oldest rocks date back to 40-60ma.

- Ginko flow member of the CRB'S

***bedrock geology***

- *sandstone*
- *siltstone*
- *mudstone*
- *conglomerate*

Nye Mudstone consist of fine grained strata of siltstone mudstone of early miocene concealed by terrace deposits, sand dunes, and mud bays, medium to olive gray massive mudstone and siltstone. the astoria and nye are tertiary rocks found in sea cliffs and are susceptible to landsliding and dip seaward creating uplifting and sand dunes.

Astoria Formation sits on top of Nye Mudstone consisting of younger yellow-gray sandstone and gray siltstone of fine to medium grained, moderatley sorted and well rounded.

the Yaquina Formation of late Oligocene-early miocene around 22-25 ma, not well exposed mud and silt deposited in deep water and buried formation. a diverse composition consisting of massive to well bedded sandstone, conglomerate, and interbedded dark gray marine siltstone. the upper and lower members are composed of medium to fine grained arkoisic and tuffaceous sandstone and siltstone.

APA format 1994 primary manual as we discussed

***geologic history***

Sedimentary and volcanic rocks are exposed along the coast and record a history of uplift and erosion along the shoreline.

### INFLUENCE OF GEOLOGY ON LAND USE AND COASTAL EROSIONS

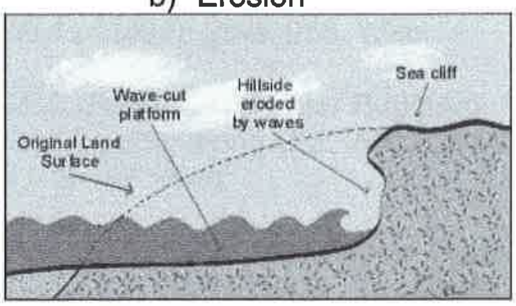
- sea level rise measured by tide gauge, ice glaciers, landslide and mass wasting. Most of the coast is divided into littoral cells that consist of stretch beaches isolated between

Soren Cullivan
Geology 201
Term paper Outline

## Hazards of the Oregon Coast

I. Introduction
  A. Coastal settlement over recorded history
  B. Coastal processes, erosion factors, uplift, precipitation
  C. General climate
    1. Humid temperate rainforest
    2. Constantly wet and damp

II. Geological Overview
  A. Tectonic Setting
    1. Juan de Fuca Plate
      a) Uplift
      b) Erosion




  B. Timeline
    1. Miocene, Pliocene, Pleistocene, Present Day
    2. Deposition/Erosion
    3. Materials

III. Erosion factors/processes
  A. Wave Climate
    1. Storm influence
    2. Climate change
  B. Dune erosion
    A. Waves
      1. Storms
      2. Inner shelf motions
    B. Wind
      1. Storms
      2. Deposition
  C. Erosion timeline
    1. Photos

IV. Effects
  A. Environment

Add Komar, 1997 paper, check your email

I sent you a copy

Drew Donahue

Geo 202

Expanded Outline

Missoula flood story of Washington/Oregon

## I. INTRODUCTION

- When and where
- How much land was affected
- How humans were affected

## II. GEOLOGIC SETTING

**Ice Age**

- Cordilleran ice sheet
- Purcell ice dam
- Dry falls

**Regional Geology**

- Columbia basin
- Hanford formation
- Washington, Oregon, Idaho, Montana

**Tectonic Setting**

- subduction

## III. MISSOULA FLOOD EVIDENCE

**Deposits**

- Glacial lake Missoula
- Clark Fork River
- Giant ripple marks in Montana
- Glacial lake sediment deposits
- Pendant bar

**Erosion**

- Palouse soils
- Gravel bars
- Scablands

6/6

Check your email for additional references - I'll send you

O'Connor & Waitt

Nathaniel Dunaway
ES 202 Principles of Geology
**Term Paper Expanded Outline**
3/7/16

6/6

*The Forgotten Desert:*
*Climate and Hydrogeology in the Eastern Oregon Scrubland*

**Topic:** Rivers, lakes, alkaline playas, and the history of geologic water systems in Eastern Oregon & the High Desert.

**I. Introduction**

*A.* Discuss obscurity of Oregon's desert relative to general knowledge regarding the other two-thirds of the state.

*B.* Detail differences between deserts and scrublands.

*C.* Provide brief overview of relevant hydro-geologic systems.

✓

**II. Geologic Setting**

*A.* Introduce major bodies of water in High Desert, i.e. Goose Lake, Malheur Lake, Harney Lake (McDowell, 1992).

*B.* Provide overview of alkaline, pluvial lakes (Allison, 1979).

*C.* Discuss important geologic structures and their relation to hydro-geologic systems, i.e. Klamath & Harney Basins, lava tubes, Blue Mountains, etc.

*D.* Other relevant information concerning High Desert geology/hydrology.

**III. Geologic History**

*A.* Origin of rivers/lakes/other hydro-geologic systems in High Desert.

*B.* Lava Flows & Ice Ages (Hooper, ....).

*C.* Climate change and its effect on desert conditions (Keen, 1937).

**IV. Present-Day Land Use & Current Geologic Issues in Eastern Oregon**

*A.* Bureau of Land Management

*B.* Agriculture

*C.* National Wild and Scenic Rivers System

**V. Conclusion**

# Neotectonics and the Holidays

Joseph Freitag

Western Oregon University

ES 202

2/29/2016

Crater Lake Ecosystem

Lily Hume
3/3/16

I. Introduction-"There are no words that can tell the hidden spirit of the wilderness that can reveal its mystery, its melancholy and its charm." - Theodore Roosevelt, President of the United States

II. Ecoregion/Geologic setting
   A. Cascade mountain range
      1. Tectonic setting
      2. Was formed 35 million years ago via Juan De Fuca Plate subduction
   B. Mount mazama
      1. last erupted 7,000+ years ago
   C. Geologic uniqueness
      1. Only place on earth like it, has incredibly high mountains and instrumental depths. How the plant life and animals got there

III. Aquatic ecosystem
   A. Depth
      1. Crater lake is 1,946 feet deep
   B. water content/ quality
      1. Ph 7.5 almost year round
   C. Temperature
      1. 38℉ Below 300 feet in the summer and 55 ℉ -60 ℉ at the surface water in the summer

IV. Ecoregion
   A . Fish
      1. shown with annual index of abundance measured by overnight gill nets since
      2. fish size, weight, condition, and sex have been measured by gill netted fish since 1997- present day

   B. Animals
      1. Abundance of chipmunks, squirrels, and deer.
      2. The less cuddly include: Grizzly bears, black bears, Mountain lions, and wolves

   C. Trees, shrubs, wildflowers
      1. Importance of the aquatic moss

Nicole Inman

Earth Science 202W

Expanded Term Paper Outline

11/6 O.K.

# Post-Glacial Sea Level Change along the Pacific Northwest Coast in the Last 20,000 Years and Future Projections

See appendix references – email 1992

I. Introduction
II. Causes and Factors
    a. Temporary
        i. El Nino and La Nina
            1. Ocean current change in Pacific
                a. Cyclical
            2. El Nino
                a. Warmer water
                b. Warm water expands
            3. La Nina
                a. Colder water
                b. Dips in sea level
        ii. El Nino vs. La Nina Pacific NW effects
            1. El Nino stronger affects
                a. Warmer, wetter
            2. La Nina a weaker system
                a. Colder, drier
    b. Long term
        i. Glacier/Ice sheet issues
            1. Gravitational pull
            2. Effects sea levels regionally
            3. Sea level rise not uniform over planet
        ii. Melting of glaciers
            1. Freshwater influx to oceans
                a. Weakening of gravitational pull
                b. Changes salinity
                    i. Affects currents/Great Conveyor Belt?
            2. Changes ocean density
                a. Basin depression from water weight
                b. Redistribution of their mass changes earth's rotational axis
                c. Melting of land glaciers raises continent buoyancy by reducing weight on land
        iii. Land elevation change causes
            1. Regional

**Pleistocene and Climate Change in the Pacific North West**

**David Jaquez**

**Western Oregon University**

**ES 202W**

**3/7/16**

6/6

# I. Introduction:

A. The only constant in this world is change, but what causes it in the PNW? The changes in sea level and climate change are due to several factors. These can be identified by their effects on planet earth, they are geographic setting, Climate change indicators, and sea level changes throughout the world.

# II. Geographic Setting

A. Plate Tectonics

1. *Pacific Northwest coast*
2. North American Plate
3. Juan de Fuca Plate
4. Cascadia Subduction Zone
5. Image of PNW plate tectonics

B. Mudstone/Glacier Stratigraphy

1. "Their presence documents that the Oregon coast has been tectonically rising for hundreds of thousands of years, while at the same time the level of sea has oscillated due to the growth and retreat of glaciers (Komar pg. 4)"

# III. Pleistocene Climate

A. Climate: the weather conditions prevailing in an area in general or over a **long period of time**

B. How is it influenced?

1. latitude
2. elevation
3. nearby water
4. ocean currents
5. Topography (arrangement of the natural and artificial physical features of an area)
6. Vegetation

Aspen Johnson
ES 202 – Winter 2016
February 28, 2016
Term Paper Extended Outline

# ~~Geographic~~ Geomorphic Setting of the Umatilla Basin

6/6

## I. Introduction

a. Location (map – state of Oregon with insert of Umatilla basin)

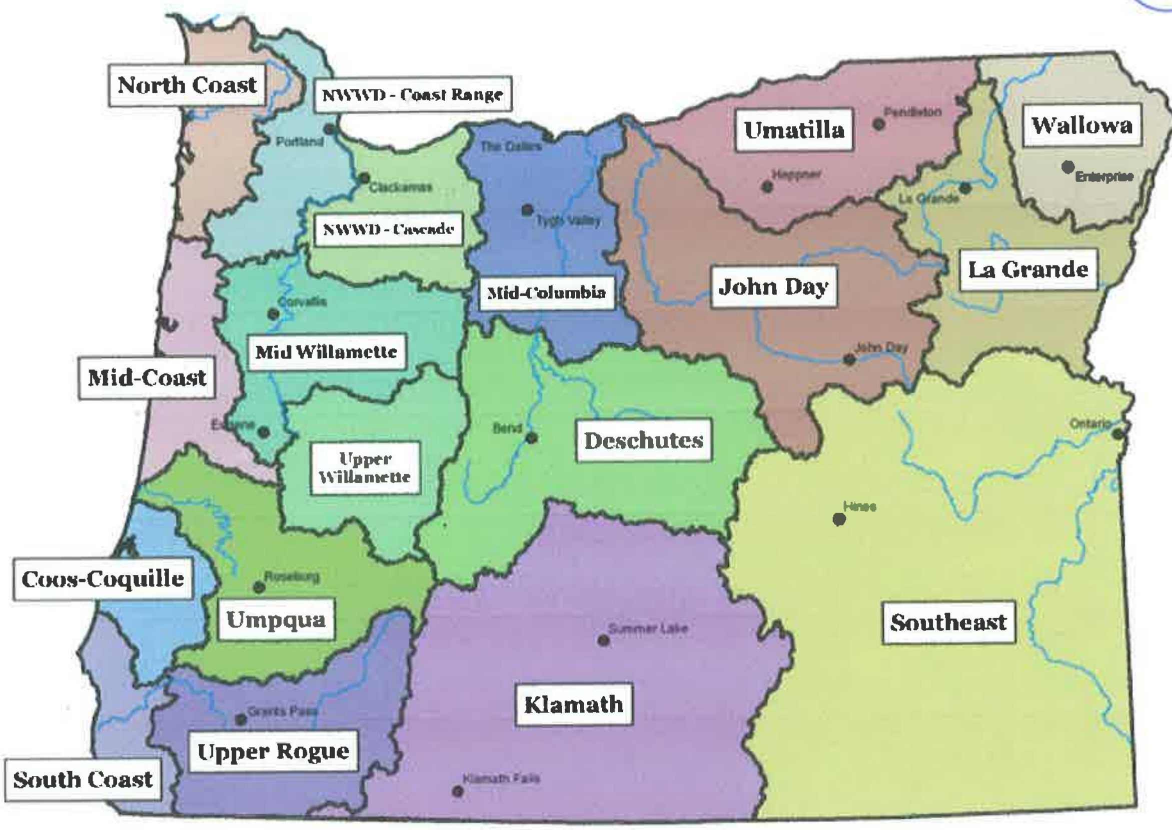



Figure 1: Map of Oregon's Water Basins (ODFW)

b. Textures and Structures of soil
   i. Texture (Three):
      1. Sand – Largest particles of the three, low AWHC, high permeability & porosity, short ribbons
      2. Silt – medium particles, medium AWHC, medium permeability & porosity, medium ribbons
      3. Clay – Smallest particles of the three, high AWHC, low permeability & porosity, long ribbons
   ii. Structure (Five):
      1. Granular – breaks off into crumbles
      2. Blocky – breaks off into blocks

# Flooding of the Willamete Valley

Sierra Johnston

ES 202

Dr. Taylor

(46)

Nathina Montgomery

Geology 202

Extended Outline

6/6

Hazards of Mount Jefferson

I. INTRODUCTION
   A. General Climate
      1. Climate change
         i. caused by retreat of alpine glaciers and increases in the frequency and magnitude of storms delivering rainfall at high elevations. Both changes affect frequency and severity of destructive debris flows—initiating region's composite volcanoes
         ii. Winter weather has more storms produce the most rainfall which contribute to landslides
      2. Geologic Features
         iii. wilderness attraction
         iv. drainage basins
         v. razor-sharp peak is the result of glacial erosion

      3. Major events
         vi. Turbid water resulted from a debris flow that mobilized off the western slope of the mountain. Debris and sediment from this event were carried down Milk Creek into Pamelia Creek and finally to the North Santiam River and Detroit Lake. (November 2006)

See reference done

II. GEOLOGIC OVERVIEW
   A. Tectonic activity
      1. Stratovolcano
         vii. Difficult to climb due to its structure=large amount of snow and intense glaciers
      2. Volcano types
         i. monogenetic, composite
         ii. loose volcanic rock
   B. Formation- lava emerging from a violently explosive vent, the volcanic cone was eventually buried under molten sheets. As the climate changed dramatically and temperatures dropped, glaciers formed over the somnolent volcano
         iii. Glacier geology, glaciers, igneous and volcanic rocks
         iv. Shaped by fire and ice
   C. Lava flows

Kendra Pietrok
March 7, 2016
[redacted]
ES202 winter
Outline

Active Tectonics of Coastal Oregon

6/6

I. Introduction

II. Geologic Setting In Oregon

   A. Plate Tectonics

      1. Great Basin

   B. Geologic History

      1. Cascade earthquakes

      2. Cascade arc

III. Oregon Coastal Process

   A. Uplift

   B. Coast Range Deformation

      1. Faults in Coastal Range

   C. Terraces

      1. Marine Terraces in OR and WA

IV. Tectonic Hazards

   A. Tectonic Deformation in the Cape Arago-Bandon Region

   B. Earthquakes in Central Cascadia

      1. Klamath Falls-Keno area

V. Conclusion

VI. References

Check email for additional references I'll send you

Connor Pomeroy

Es 202

Dr Taylor

March 2016

# The Hydrology of Crater Lake-Outline

- Overview of Crater Lake
  - Size and Location
    - Located in south central Oregon, southern end of Cascade Range.
    - 20.53sqmi surface area, 4.2cumi volume (14 million acre feet)
  - Depth
    - Second deepest lake in North America, in July 2000 it was 594m (behind Great Slave Lake in Canada 614m)
    - Third deepest average depth lake in the world but first in North America, 349m ( first is Baikal 758m, second is Tanganyika 540m)
    - Since measurement began, the lake has never fluctuated in depth more than 16 feet; year to year average fluctuation is 1-3 feet
  - Clarity
    - Record clarity depth in August 1994 of 40.8m, average clarity depth of 27.4m-30.5m
    - Top 15m of water have greater UV transparency than pure water (Hargreaves 2003)
- Water entering the lake
  - Precipitation
    - 78% of all inflow

David Solvedt

March 6, 2016

(66)

Geologic History of the Columbia River Gorge: Expanded Outline

✓ o.K.

1. Introduction:

As citizens of Oregon, many of us have taken a scenic drive past the beautiful and gargantuan Columbia River that serves as the border between Oregon and Washington. Little do most of us know how immensely important this river gorge and its geologic history have been in making our state the fertile, plentiful and breathtaking land that we see today. The Columbia River Gorge has not always been the vast channel of water as we currently know it, but rather has been subjected to an array of geological processes over the past thousands of years that have shaped and reshaped the landscape of the river gorge and surrounding areas. Throughout the course of this paper we will analyze some of the most important of these geological processes, and their contribution to the formation of the Columbia River Gorge. Specifically we will examine the geological setting of the gorge pertaining to tectonics and bedrock geology, and then take a look at some of the historic catastrophes of the Columbia River Gorge, including the Missoula floods and the Bonneville landslide. Cumulatively, this information will reveal the geologic history of the Columbia River Gorge and how it has shaped and contributed to the topography of the beautiful state that we live in.

2. Geological Setting
   - I. Tectonics
     - a. Plate collision/subduction
       - i. Juan De Fuca + North American Plates
       - ii. Production of pertinent volcanism
       - iii. Cascade mountain formation
   - II. Bedrock Geology
     - a. Igneous Rock types
       - i. Basaltic magma flows
       - ii. Metamorphic processes

Paul Rostad

ES202: Principles of Geology

Professor Steve Taylor

February 29, 2016

6/6 ✓

Expanded Outline of Paper on Southeast Alaskan Glaciers, Isostasy and Rebound

**I) Introduction**

i) During the planet's most recent ice age, an enormous glacier known to climate scientists as the Laurentide Ice Sheet covered a significant portion of the United States and Canada. Glaciers are known to endow the land where they once laid with a unique mechanical process that highlights the "sponge-like" property of isostasy in solid rock. Once the majority of the Laurentide deglaciated away —leaving behind only a few remnants in the highest peaks of the mountainous regions of southeast Alaska— the area began to experience a slight change in elevation due to the reduction of force on the earth's surface. Glaciers, especially in northerly climates, are especially sensitive to the effects of global climate change, resulting in the hastening of mass wastage and melting processes. As a result of glacial melting, rebound and isostasy, Southeast Alaska is home to the "world's fastest present-day glacio-isostatic uplift".

*ii) Isostasy*

⇒ The earth's crust can be thought of as an island floating on a sea of magma that is the asthenosphere; a layer of plastic-like molten rock above the comparatively larger mantle. Isostasy is a state of equilibrium between two opposing forces: gravity and buoyancy. Gravity combined with mass applies a force downwards on top of earth's crust. Meanwhile, buoyancy applies an opposing force upwards against gravity due to the difference in volume and density between the hard rock in the crust and the dense molten rock in the asthenosphere. When the force applied by gravity is greater than the buoyancy force, an impression is created where the bulk of the force pressed down. Glaciers provide the mass necessary to create these impressions on the earth's crustal layer.

*iii) Rebound*

⇒ Isostatic rebound occurs when the downward force of an object or feature's mass is relieved. During this time, the area it once occupied may experience 'rebound' when the ground begins to slowly rise back to its state of equilibrium from before it was deformed by the object or feature.

**II) Glacial Setting**

i) Southeast Alaska had an abundance of glaciers due to the climate during the Pleistocene-Holocene. The temperatures were more frigid and the sea-level was lower due to the emphasized presence of glaciers; which pulled more water from the sea with far less return, causing glacial mass to increase and apply pressure to the crust where

Cayla Stevenson

3/7/16

Term Paper Extended Outline

# The Missoula Flood Scablands

1. **Introduction**
   a) Historic time period and geologic location of event.
   b) Climate of area
      - Glacial melting, grassland setting.
   c) J Harlen Bretz
      - His observations, the Missoula Flood theory, Geologists' response to the hypothesis. (1923)

2. **Geologic Overview**
   a) Plate Tectonics
      - Pacific NW
      - Juan De Fuca/ Cascadia Subduction zone
   b) **Bedrock composition**
      *Volcanic rock (Basalt)*
      - Early surrounding volcanic activity
      - Miocene Epoch of the Tertiary Period
      - Layers of easily eroded Basalt, bedrock.
      *Top soil formation (Silt)*
      - cover of windblown silt or loess began to accumulate from nearby lake formations, producing the fertile soils of the Palouse country of southeastern Washington.

   SEE / CHECK email for additional references

   c) **Ice Age and Glacial formation**
      *Creation of lakes*
      - Joseph T. Pardee and his evidence of a great ice dammed lake, Glacial Lake Missoula. (1910)
      - Cordilleran ice sheet dam
      - Glacial Lake Missoula was created

   d) **Geology During the Ice Age**
      *Processes occurring*
      - Debris, boulders, trees etc. were carried by large ice sheets
      - As glaciers began to melt, the carried debris began to erode the landscape.
      *Impact on landscape*
      - Erosion of landscape forced dams to fail, causing large amounts of water to flow

Brent Sumner

03/7/16

Geology 202

Outline for term paper

6/6

check email for additional references to include

# Columbia Gorge History

I. Introduction
   a. What is the Columbia gorge
   b. The history of it
      i. The Missoula floods
      ii. The evolution of the Columbia gorge
II. Geologic overview
   a. Columbia River flood basalts
      i. Miocene tholeiitic flood basalts
      ii. area of coverage $1.6*10^5$km^2
   b. Surrounding areas
      i. The geologic structures that it makes in different areas
III. Geologic history
   a. Missoula flood
      i. Impact on the Colombia river
      ii. The flood discharge rates
      iii. The buildup of water by ice
   b. The evolution of the Columbia gorge
      i. The records of floods in the Columbia
IV. Impacts on environment
   a. past impacts
   b. What would happen if a giant flood happened now
      i. Human impacts
      ii. Fish impact
V. Summary and conclusion
   a. Re connecting the importance of the columbia river gorge and the history behind it
   b. What future we have with the area and what possible dangers
VI. References cited

Joey Tavares

# Tsunami Hazards and Deposits in Coastal Oregon

6/6

I. Introduction

Oregon coast sits along cascadia subduction zone making it susceptible to large tsunamis. Past tsunamis have moved in large amounts of sandy sediment that was washed from the continent by rivers.

II. Coastal formation

a. Formation of continental shelf in PNW

b. Compare contrast hazards in PNW from East coast shelf.

Coast off of Oregon is one of the deepest shelfs. (Hazards '09)

c. Sediment load at base of shelf off Oregon coast.

Sediments dump into the pacific at the mouth of many large rivers (Rouge, Willamette etc.)

Sediment is forced to the bottom of the shelf that acts as a basin, idle sediment lays in wait until a force strong enough comes to uplift it.

II. Tectonic activity in relation to Tsunamis

a. Past tsunamis (Last one in cascadia ~1700)

There have been three "major" cascadia tsunamis in the past that have played a part in shaping the coast off of oregon.

b. Water levels in relation to tsunami severity

Influence of water levels factors into the size and capacity to carry sediment. As well as the affected zone in terms of damages.

c. Cascadia subduction zone

d. Cascadia (Local) and Distant tsunamis

III. Cascadia tsunami deposits at Nestucca bay, Oregon

a. Three earthquakes have moved sediment inland, sorting is fine to coarse

Moving inland the sediment becomes more coarse and poorly sorted. Finely sorted silt and sand stays closer to the body of water as it's a lighter load and isn't capable of traveling as far inland.

b. Sediment spans as far as 4.4km inland

Other recorded deposits along Nestucca show sediment linked to tsunamis only spanning ~1.5km inland. Testament that smaller tsunamis have hit and shaped the immediate coastline in that area.

c. Sand deposited inland predates sediment moved in by river flooding

Sediments found in the bay and surrounding areas predates sediments thought to be linked to river flooding and deposition. ( Nestucca Bay 09)

d. Marine or Brackish Diatoms confirm it is a Tsunami deposit

Brackish diatoms found inland mixed with the deep ocean sediment

JOEY – check your email – I'm sending you some additional resources to include

Lexington Taylor
March 5, 2016
ES 202
Dr. Taylor

5 | 6

River Restoration for the Crooked River Basin

- Introduction
    - Current Climate
        - Dessert region
    - Changes in climate/ past climate
    - History on rivers
    - Changes in the rivers
- Physiographic setting
    - Regional
    - Hydrology of the land
    - Land use/ What do they use it for
        - Agriculture
        - How their water is used/ comes from
- River Restoration
    - How?
    - Where?
    - Why?
- Conclusion
    - Type of area
    - Type of water used in this area
    - How it has changed

More on back →

Matt Whitesell

ES 202: Principles of Geology

Dr. S. Taylor

March 4 2016

Check email for additional resources – I'll send you

6/6

Seismic Hazards to the Willamette Valley

in

Intro:

- Explain goal of paper
    - What are the different levels of risk and hazard in certain areas?
    - What effects will the soil and bedrock have?
- Area of study
    - Willamette Valley separated into three sections: (Yeats, Graven, Werner, Goldfinger, Popowski, 1996)
        - South of Salem
        - Between Salem and Tualatin
        - North of Tualatin
- List topics to be covered
    - Section headings below.

Seismic Hazards

- What are seismic Hazards?
    - Earthquakes at fault zones
        - Juan de Fuca Plate (Pacific Northwest Seismic Network)