



CENTRAL WASHINGTON UNIVERSITY

DEPARTMENT OF GEOLOGICAL SCIENCES

GEOL 502 Regional Field Geology of the Pacific Northwest

<http://www.geology.cwu.edu/>

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Quarter: Fall 2007
Lecture: as posted
Field trips: as posted on course website
Instructors: Lisa Ely
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Winston Norrish
Room: Lind Hall 300H
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Additional field trip leaders:
Wendy Bohrson
Carey Gazis
Beth Pratt-Sitaula
Charlie Rubin

Course description

Field studies in the Pacific Northwestern United States.

Learner outcomes

By the end of the course you will be able to:

- locate and describe important geologic features (*e.g.*, outcrops, landforms, structures) of the Pacific Northwest
- relate observations of Pacific Northwest geology to processes that have, and do, operate to produce and modify rocks
- discuss in a general way the geologic evolution of the Pacific Northwest with specific examples

Participation and coursework

Participation in all planning meetings, lectures, and field trips is mandatory. You are expected to prepare yourself for each field trip including equipment, food (as required), and academically.

Several field trip handouts, readings, assignments, equipment and schedule are posted on course website. Other handouts will be distributed at initial meeting and individual field trips.

Logistical preparation will be discussed in planning meetings prior to leaving for the field.

Academic preparation will normally include familiarity with set pre-fieldwork readings.

Written Assignment:

No later than **Friday October 19, 2007**, turn-in the following to **Winston Norrish**:

1. A typed (1.5 line spacing; Times 12 point; 2.5 cm margins; approx. 5 pages) description of the geology and relevant geological history of the Pacific Northwest. The title of the mini-essay will be: **An outline of the geology of the Pacific Northwest**. A good outline will include literature references, specific examples/descriptions drawn from your own field observations and interpretations, illustrations, appropriate use of a map(s), sections with appropriate subheadings, and no spelling or grammar errors.
2. Two typed (1.5 line spacing; Times 12 point; 2.5 cm margins; approx. 3-4 pages) reports discussing in greater depth the topics covered on **two** of the following 4 field trips: Channeled Scablands, Mt. St. Helens, Yakima Canyon or Seattle Fault. The first field trip to Kittitas Valley and North Cascades is a general overview, and is not a choice for the in-depth topical reports. Each of your two topical reports should:
 - a. address the specific questions provided on the handouts from the field trip leaders of those trips (see list of questions for each field trip below)
 - b. include a log of field stops
 - c. include a detailed outcrop/landform description of one principal geological feature on the trip
 - d. relate the geological topic of that trip to the general geological history of the Pacific Northwest.

Questions for topical essays on individual field trips

Choose two:

1. Missoula Floods and Continental Ice Sheet
 - a. The number, magnitude and age of the Missoula floods are still strongly debated by researchers, even 80+ years after Bretz initially proposed his “outlandish hypothesis” that massive floods carved up the landscape of eastern and central Washington. Develop your own conclusion about the number, relative magnitude, and relative or absolute age of the floods at the sites that we visit on this field trip, as well as the spatial and temporal relationship of the floods to the Cordilleran ice sheet in north-central Washington.
 - b. Discuss how the preexisting geological formations and features in the region influenced the erosional and depositional effects of the Missoula floods. Support your interpretation with a synthesis and comparison of the information that we gather at different sites along the Missoula flood route.
2. Yakima Watershed Hydrology and Geomorphology
 - a. How has the Yakima Fold Belt affected the ground-water and surface-water flow through the Yakima Watershed?
 - b. Provide a reasonable explanation for how and why the Yakima River incised its canyon directly through the Yakima folds.
3. Mount St. Helens
 - a. During the 1980 Mt. St Helens eruption, there were at least three major volcanic hazards that impacted the surrounding region. For 3 of these, summarize the volcanic event and associated deposit (e.g., lahar) and provide a concrete description of the hazards potentially incurred by humans and property.
 - b. The Mt. St Helens eruption that began in 2004 resulted in new dome growth that has been carefully monitored by the US Geological Survey. Provide a description of this recent activity, and contrast likely differences in characteristics of the

magmatic system that fed this most recent eruption and those that led to the Plinian phase of the 1980 eruption.

- c. What precursory data might allow geologists to distinguish a dome-forming vs. Plinian event?

4. Seattle Fault

- a. Describe the evidence for Holocene activity on the Seattle Fault.
- b. Discuss the types of data required to identify active faults (e.g., 10,000 yrs or younger) in the Puget Lowlands.

Assessment and grading

A final grade will be awarded based on both your field and written-work performance.

	Assessment criteria	Excellent	Good	Satisfactory	Unsatisfactory
1	Safety	Always follows safety protocols.	Commonly follows safety protocols.	Ignores safety protocols.	Endangers self or others.
2	Field participation	Attends, willingly and actively participates.	Attends and participates.	Attends, but is unprepared and tends not to participate.	Misses one or more trips and is poorly prepared.
3	General essay (Geologic Outline)	Submits a typed, structured, and coherent essay including references, specific examples, illustrations, & map. Report goes beyond description and demonstrates a depth of understanding.	Submits a typed, structured, and generally coherent mini-essay including references, specific examples, illustrations, & map.	A typed report that provides minimum detail and a somewhat incomplete description of selected outcrop/landform.	A short report with little detail or no report submitted.
4	In depth essays on two of the field trips	Two typed, structured, essays on topics from two of the field trips, that include the required elements listed above. Essays go beyond description and demonstrate a depth of understanding.	Typed and structured essays that include the required elements, and show adequate detail and understanding.	Submits a typed, illustrated and structured mini-essay but fails to fully meet "good" criteria.	Failure to meet "satisfactory" requirements.

Grade assignment — minimum requirements for:

- A** grade “excellent” in all criteria
- B** grade “excellent” in 3 or 4, “good” in others
- C** grade “good” in all
- D** grade “satisfactory” in all

An “unsatisfactory” in criteria 2, 3, or 4 will result in an **F** grade.

CWU policy on cheating

The university requests that the policy on cheating is made clear to all classes. Although you may be encouraged to work together in class or on homework assignments, the individual is ultimately responsible for any piece of work, which must be written by the individual in the entirety of the work including text, numerical data, and figures, unless the original source is clearly cited and referenced. Any violation is likely to result in no credit given. Cheating may be reported to university authorities.

Class schedule (additional information on GEOL 502 course website)

Field trips:	Kittitas County and the North Cascades	Leaders: L. Ely, W. Norrish
	Channeled Scablands	Leader: L. Ely
	Mt. St. Helens	Leader: W. Bohrson
	Yakima River Canyon	Leaders: C. Gazis, B. Pratt-Sitaula
	The Seattle fault and surrounding area	Leader: C. Rubin

Friday, Sept. 7

Organizational meeting, LIND Hall, room 103 at 10:00 am.

Monday, Sept. 10

1-day North Cascades field trip, arrive by 7:45 am; depart LIND Hall parking lot at 8:00 am. Return by 6:30 PM

Tuesday Sept. 11

Depart for Channeled Scablands trip, arrive at 8:00 am; depart from LIND Hall parking lot at 8:30 am.

Wednesday Sept. 12

Return from Channeled Scablands trip by 6:00 pm.

Thursday, Sept. 13

Depart for Mt. St. Helens field trip, arrive by 7:45 am; depart from LIND Hall parking lot at 8:00 am.

Friday, Sept. 14

Return from Mt. St. Helens trip by 9:00 pm.

Sunday, Sept. 16

1-day Yakima Canyon **raft** trip, arrive at 8:45 am; depart from LIND Hall parking lot at 9:00 am. Return by 6 PM.

Saturday, Sept. 22

Seattle Fault field trip; arrive at 7:45 am, depart from LIND Hall at 8:00 am. Return by 8:00 pm.