

# The Geology of Pacific Northwest Rivers, Glaciers, & Deserts

## Final I Study Guide

### Hydrology (Lecture 6-7)

What is a watershed? What is stream discharge (and what units are used for Q)? How are Q and Watershed Drainage Area related? How does one calculate Q? What is a hydrograph (what are on the horizontal and vertical axes)? What does  $Q=CA$  tell us? What is the stage of a river or stream? What is the relation between stage and Q? What is lag time? What are some things that make lag time shorter or longer? How do urbanization and river management effect stream/river flow (give two examples)? How does a river/stream change when it is straightened?

### Landslides (Lecture 7-8)

What is the general force balance for slope stability (what two forces balance each other)? What is the difference between a fall, a slide, and a flow? What is the difference between a translational slide and a rotational slide? What are some factors that control slope stability (and how do they work)? What are the landslide triggers (and how do they work)? Could you determine if a slope were stable based upon drawings similar to the ones in the lab (e.g. the houses on a sloped surface)?

### Hydrogeology (Lecture 8)

What are the forces that move groundwater? What is the water table? What is the vadose zone? How are the water table and the vadose zone alike/different? Where is the saturated zone in relation to the water table and the vadose zone? What is an aquiclude (where is it)? What is a perched water table (why is it perched)? What is a confined aquifer? How is a confined aquifer different than an unconfined aquifer?

What is the difference between porosity and permeability? What is required (for porosity and permeability) to have higher slows of ground water? What is Darcy's Law? Could you calculate flow rate Q with Darcy's Law (if you were given the hydraulic conductivity and the cross sectional area)? What are recharge and what are discharge areas? In which directions does contaminated ground water flow?

Could you draw water table contours? Could you determine the direction of flow of groundwater given ground water table contours? What is Hydraulic Head? In what units are Head measured? From what spatial reference is Head measured? What is an artesian well? How are gaining and losing streams different (what does it say about recharge and discharge)?

# The Geology of Pacific Northwest Rivers, Glaciers, & Deserts

## Final I Study Guide

### Climate, Glaciers, Marine Terraces (Lecture 9)

What is solar insolation? How does solar insolation control the climate? What are the three ways in which earth's rotational patterns vary with time (Milankovitch)? What are the time scales that these three cycles have? What is the cause for glacial cycles? What are glaciers?

How are sea level and glaciers related (how does one control the other)? Is the sea level higher or lower during a glacial period? Why? What are some evidences of past glacial periods? What are some proxies for past climate?

What is the Greenhouse Effect (provide some example forcing factors)? What affects the climate (provide at least one example of something that increases global temperatures and one example of something that decreases global temperatures)? When did the climate significantly diverge from the natural cycle of climate changes? What happened at this time? What are some effects of the anthropogenic forcing of climate change (provide three examples)? Describe the evidence used to support the hypothesis that the climate is changing due to the actions taken by people today and in the past.

How are marine terraces formed? What are the two main time-varying processes that interact to form them? What is an abrasion platform? What is the shoreline angle? Are uplifted marine terraces formed during glacial or interglacial periods? Could you use the terrace uplift rate formula to determine the uplift rate? Could you use a sea level curve to estimate the age of a marine terrace, if you know the uplift rate?