GEOG 107–Our Dynamic Earth

**Exercise 9–Ice Age Floods in the Pacific Northwest**

*Lab created by Dr. Karl Lillquist and modified by Dr. Bob Hickey*

*Background and Instructions*: Gigantic floods shaped the physical geography of the Pacific Northwest during the last Ice Age. Using a variety of resources (see below), answer the following questions. Then head onto Canvas to take the Quiz.

Make sure you go through all the videos, websites, etc on the geology of WA (***and the Sculpted by Flood vid***) before doing this lab. The answers to your questions will be based on both this info and what you do in Google Earth.

Fire up Google Earth. We’ll use this as our base map. Remember, that when you mouse over somewhere in GE, you can get the latitude, longitude, and elevation (it’s on the bottom bar). The default is is lat/long with measurement in meters/km. If you want to change that, goto tools – options and change away!

1. What created Glacial Lake Missoula? Briefly explain.

2. Go to Missoula, Montana and find the University of Montana campus. Look on the hillside above (and immediately east) of campus near “The M”. What landforms are the parallel linear features on this slope? Briefly explain. Note, there are more lines on the hillslope to the NE, same thing.

3. Assume that the highest of these parallel lines (~4,200 ft) represents the maximum extent of Glacial Lake Missoula. How deep was the water over the main square at the U of M campus (the circle bisected by two lines)? You can answer this by mousing over these locations and reading the elevation at the bottom of the GE window.

4. Why did Glacial Lake Missoula suddenly spill into what is now the Sandpoint, Idaho area as a giant flood multiple times during the last Ice Age? Briefly explain.

5. Go to “Camas Prairie, Montana” in GE. Look north (and a little east) of there until you see multiple parallel lines. Note that these look different from the multiple parallel lines on the

slopes above the University of Montana campus. What are these parallel lines and what do they

indicate?

6. As the floodwaters raced south from the present-day Sandpoint, Idaho area, they deposited much of their bed load in the Rathdrum Prairie and Spokane Valley area. You can see this area in GE. How is the topography of this area different from the surrounding areas? Why?

7. Same area, would you expect groundwater pollution to be a potential issue in this area? Why?

8. From the Spokane area, the floodwaters spread out over the landscape eroding the “Channeled

Scablands”. Zoom back out until you have a view that extends across much of

Eastern Washington. Are the flood channels the light or dark toned areas? Briefly explain.

8. Are these channels erosional or depositional features? (<https://socratic.org/questions/what-is-the-difference-between-erosion-and-deposition> )Briefly explain.

9. Now zoom back in. Compare and contrast the human land use of the light and dark toned areas. Why is this pattern the way it is? Briefly explain.

Some of the floodwaters made it to the site of present day Grand Coulee, Washington. From there, they were diverted south by a large ice sheet. Floodwaters eroded the amazing Grand Coulee. Much of this coulee has been dammed and flooded (from water pumped in from behind the Grand Coulee Dam, forming Banks Lake. This lake is used primarily as a reservoir from which much of central WA is irrigated. More info at <https://en.wikipedia.org/wiki/Grand_Coulee>

If you zoom out a bit, you can see that the valley made by these floodwaters (Grand Coulee) stretches from just south of the town of Grand Coulee down to Soap Lake.

10. Along this valley, approximately how long is Grand Coulee (use the path measuring tool in GE)?

As the floodwaters left the confines of the Upper Grand Coulee just east and northeast of Coulee City, they should have slowed down and deposited sediment. This is the large, relatively flat, irrigated area that stretches through the Quincy-Moses Lake-Royal City area.

11. Dry Falls State Park is actually pretty cool. I’d recommend a road trip if you haven’t been there. <https://parks.state.wa.us/251/Dry-Falls> That said, goto Dry Falls Lake in GE. How tall is the falls (the difference between the water elevation and the top to the N)?

Extra credit question:

1. What is the origin of Soap Lake?