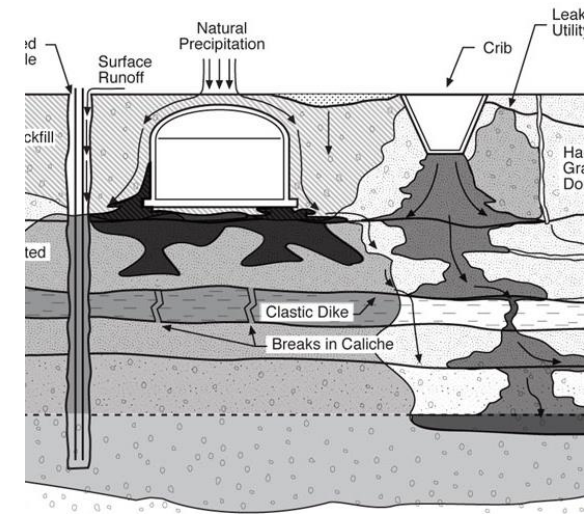
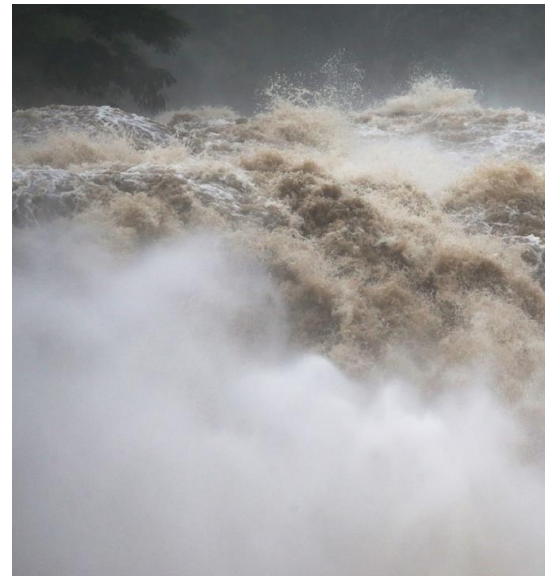


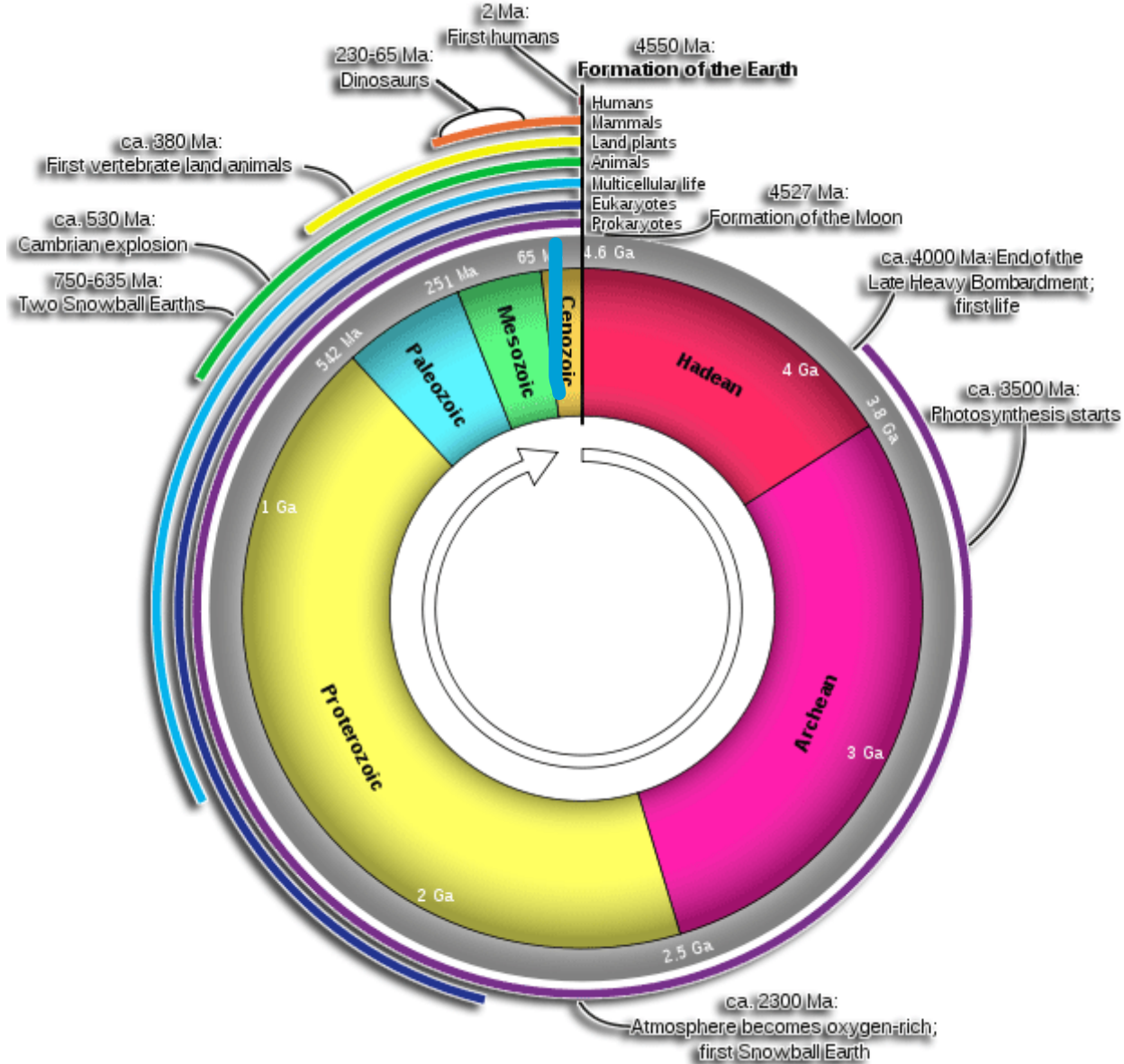
# A Brief (Geologic) History of Hanford

Tom Sicilia, RG  
Hanford Hydrogeologist

Oregon Hanford  
Cleanup Board January  
2022 Meeting

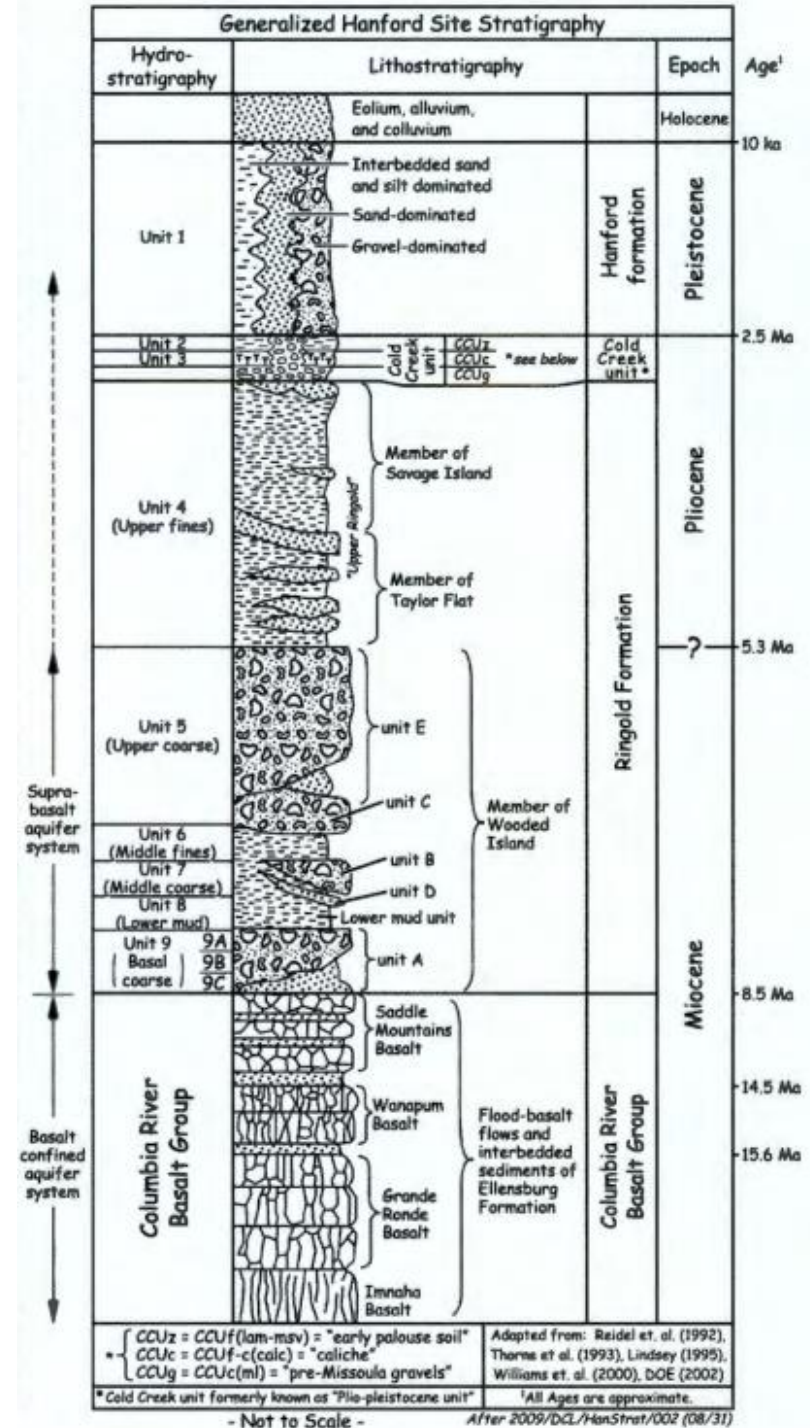


# Lesson One: It is all relative

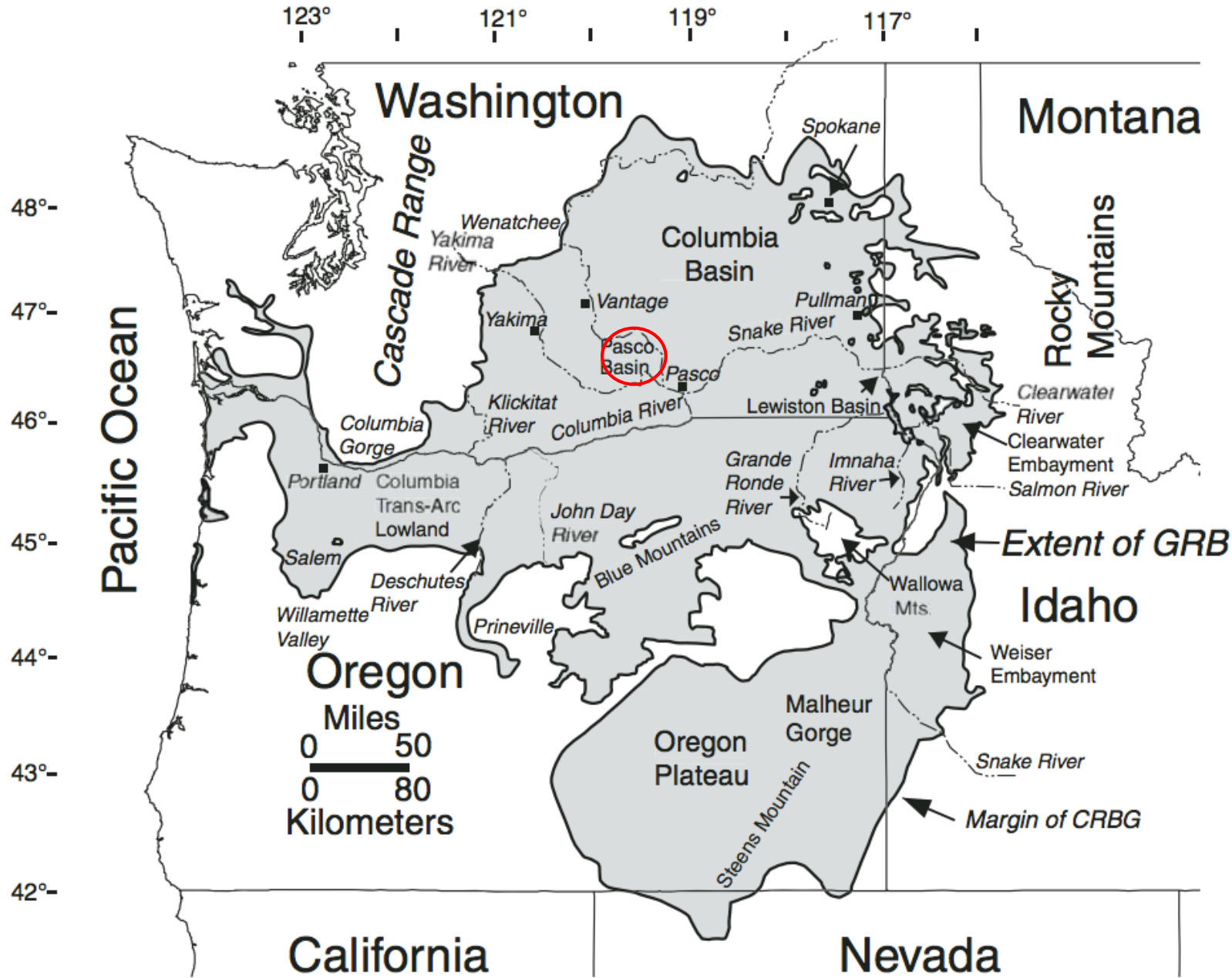
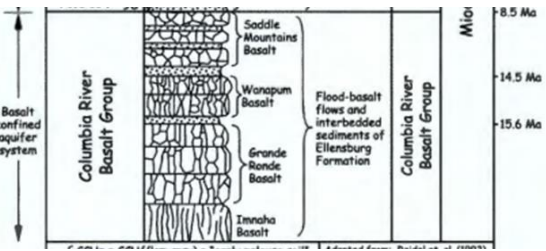


# Roadmap (A Tale of Floods)

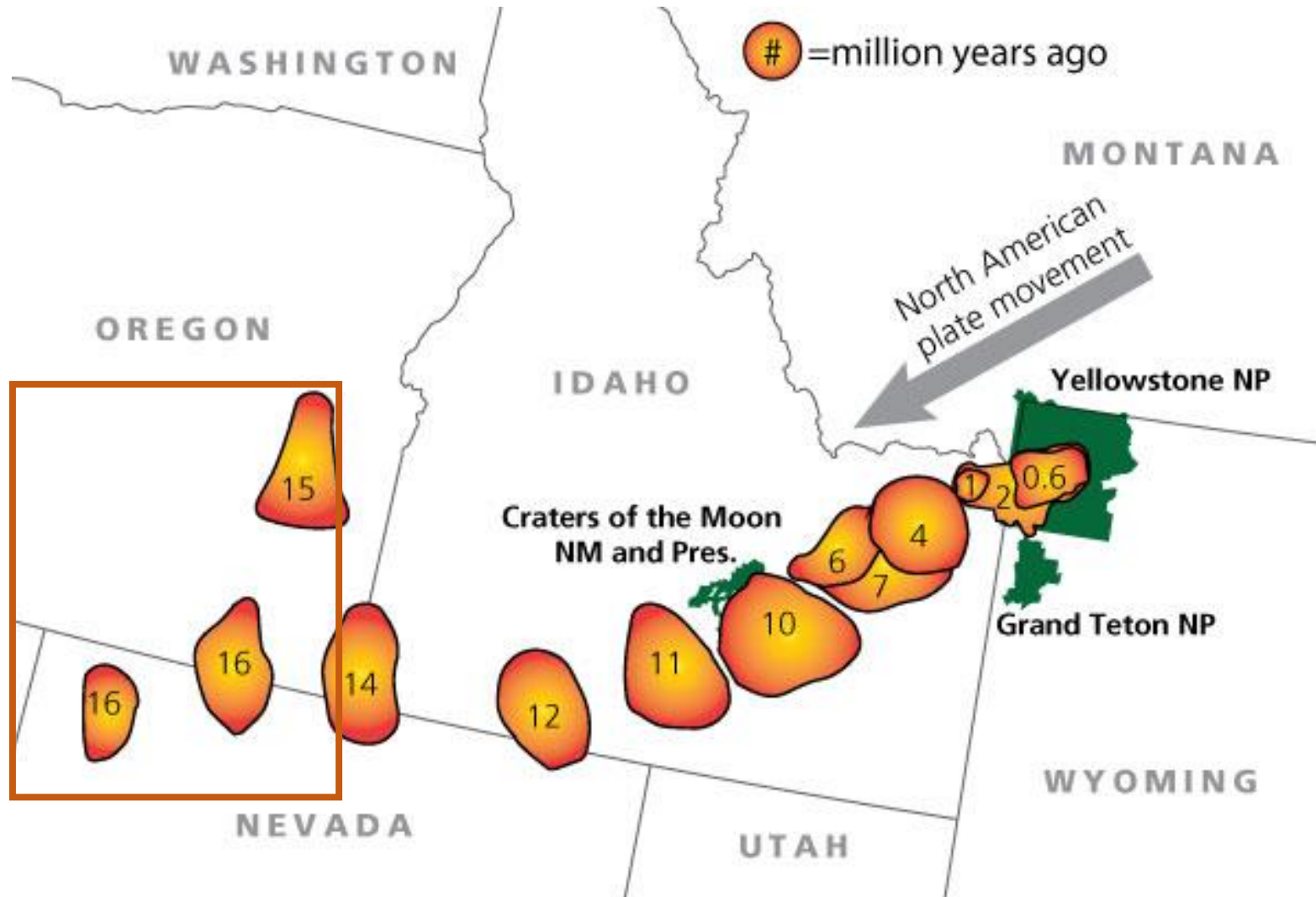
- Old to New (bottom to top)
- Hot Floods
- Confused Channel
- Cold Floods
- Hanford

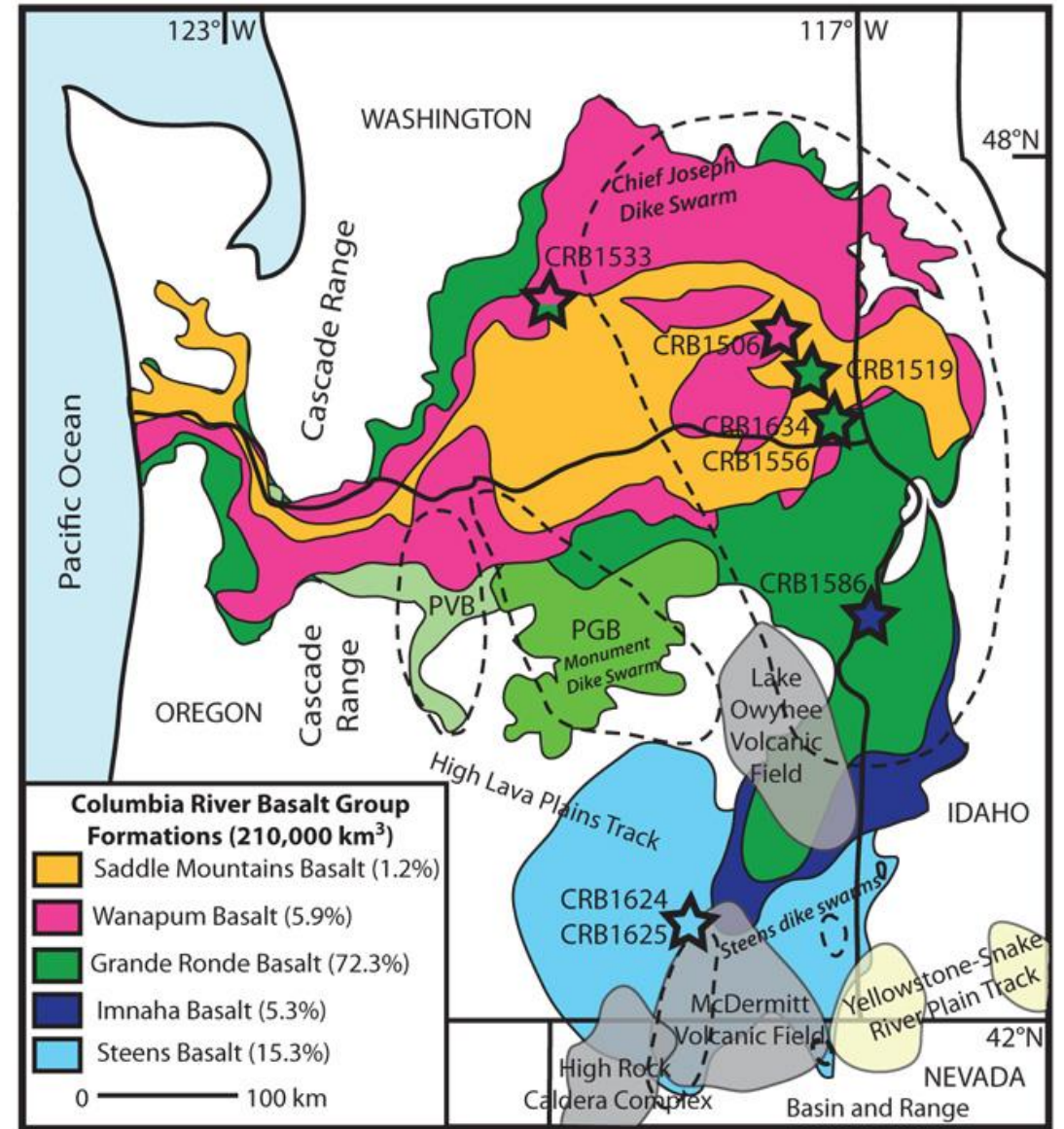
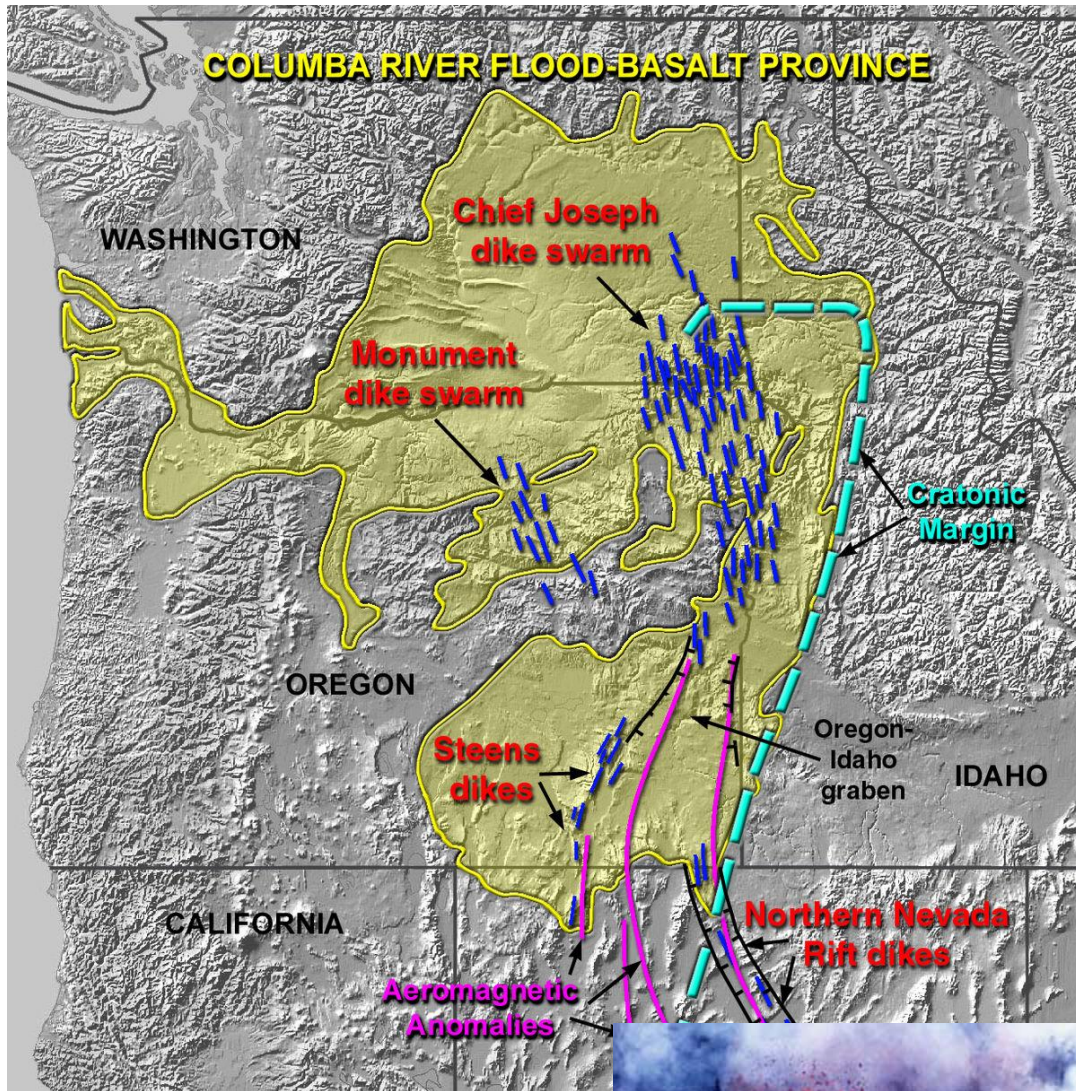


17-5 Million Years Ago  
 (Floods: A Hot Mess)



# Old Faithful as a Youth





# Rock is Solid, Right?

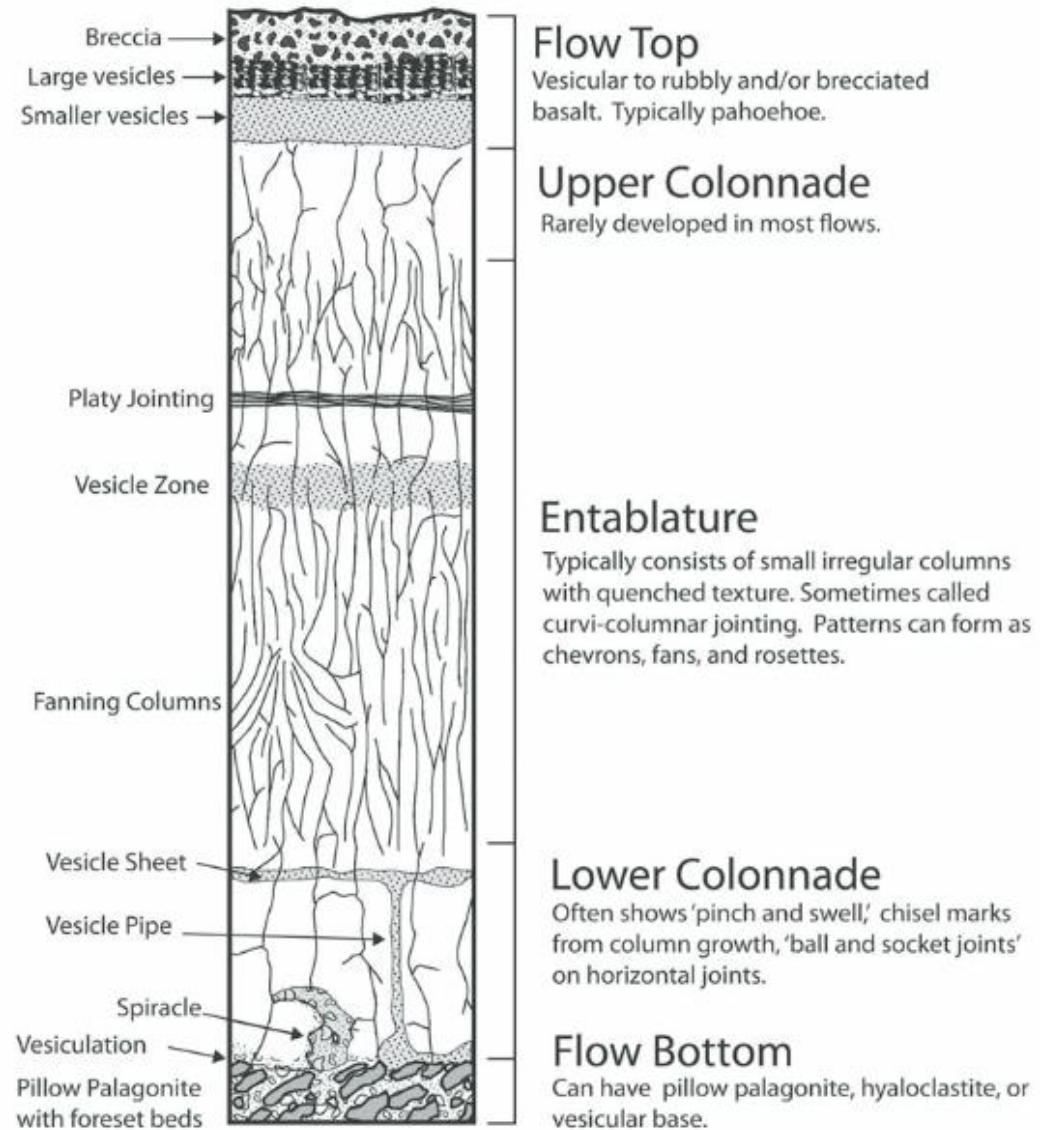


Moses Coulee

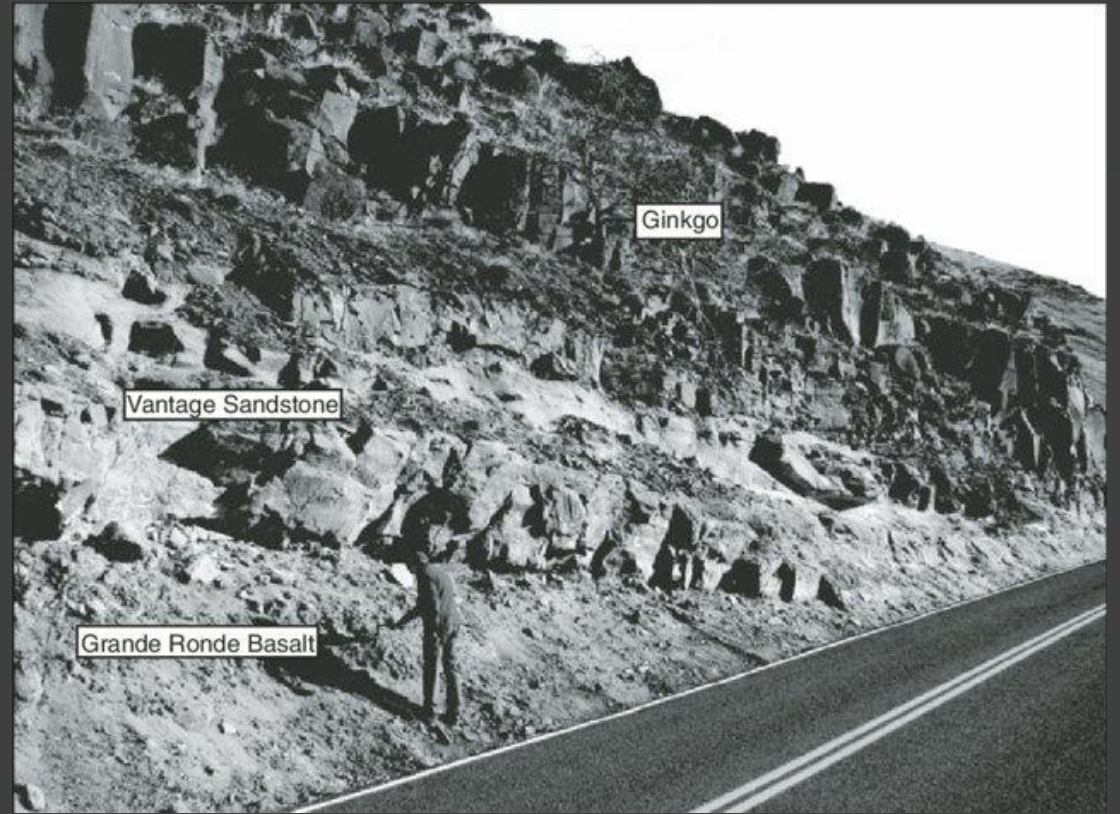


Latourell Falls

# Rock is Solid, Right?

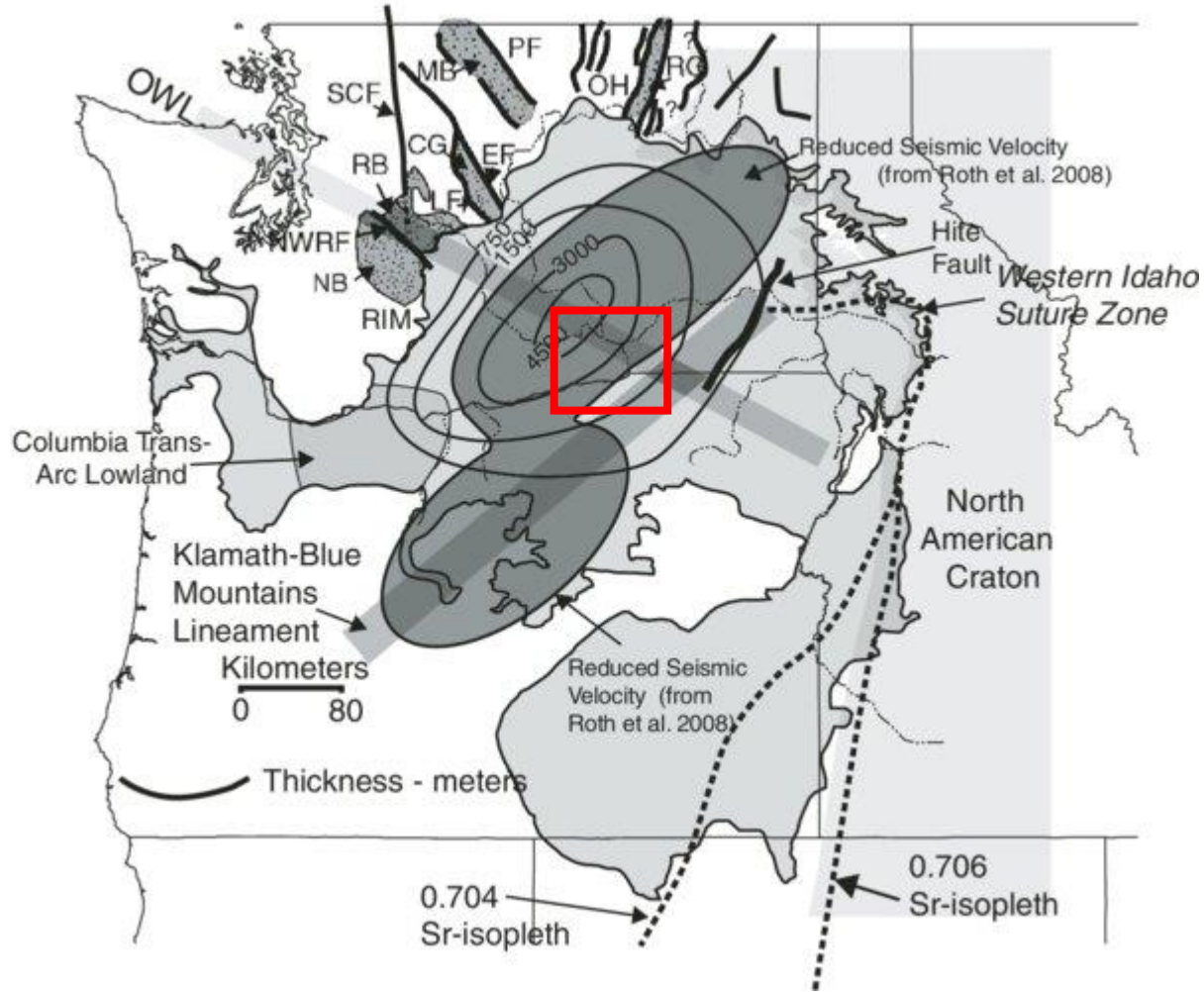
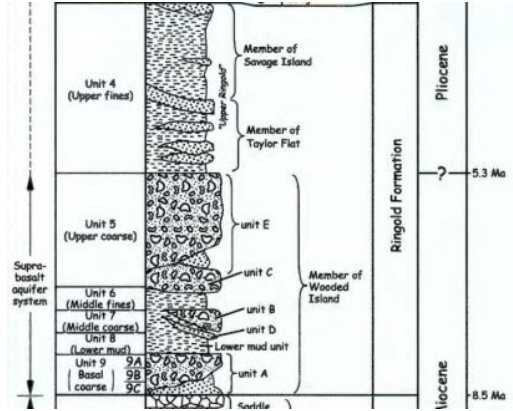




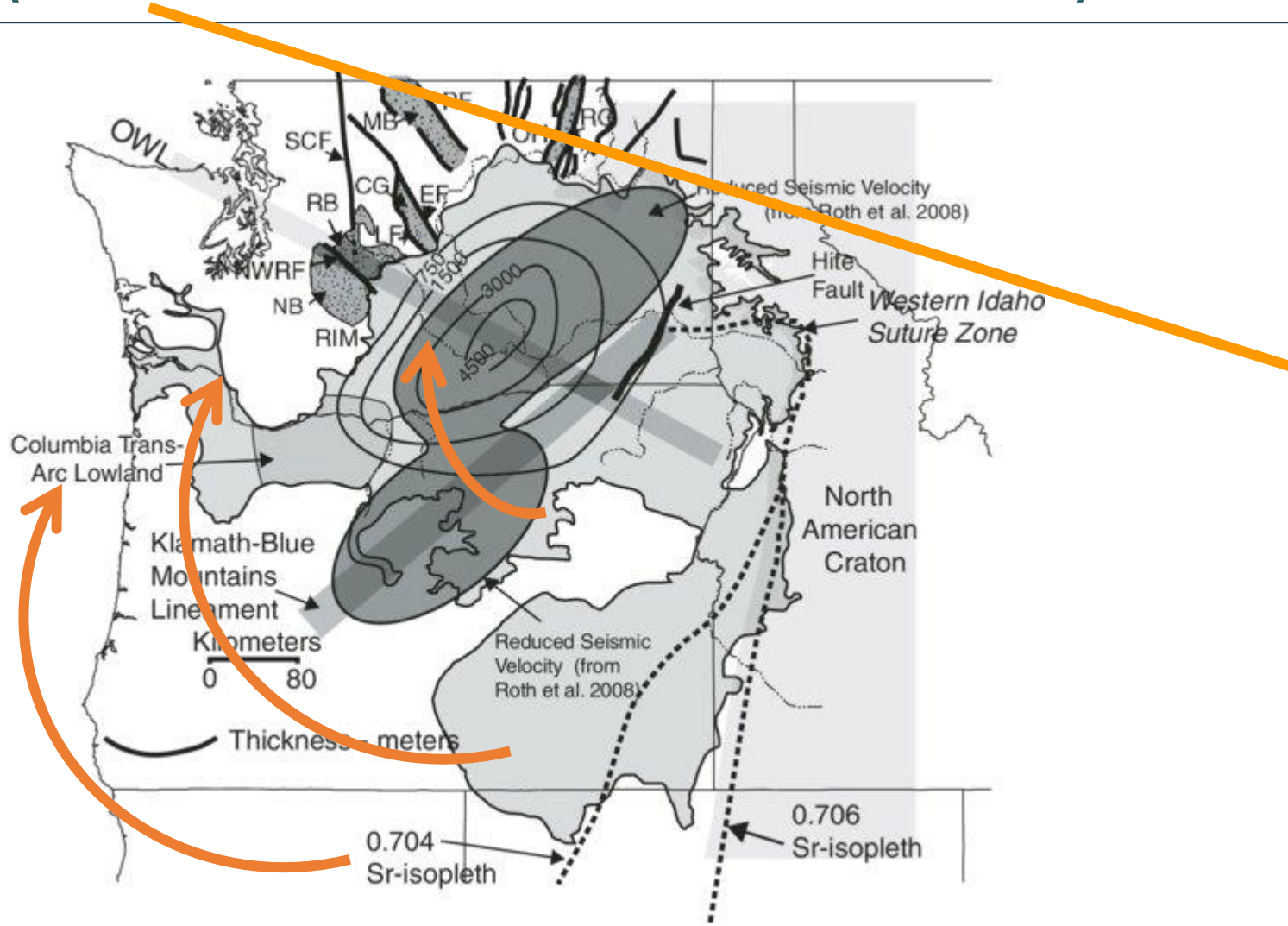
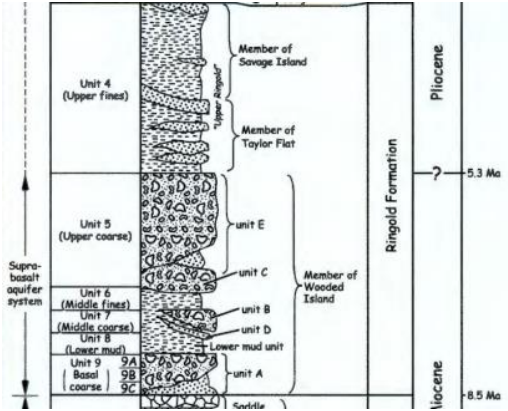


Thousands of years between flows

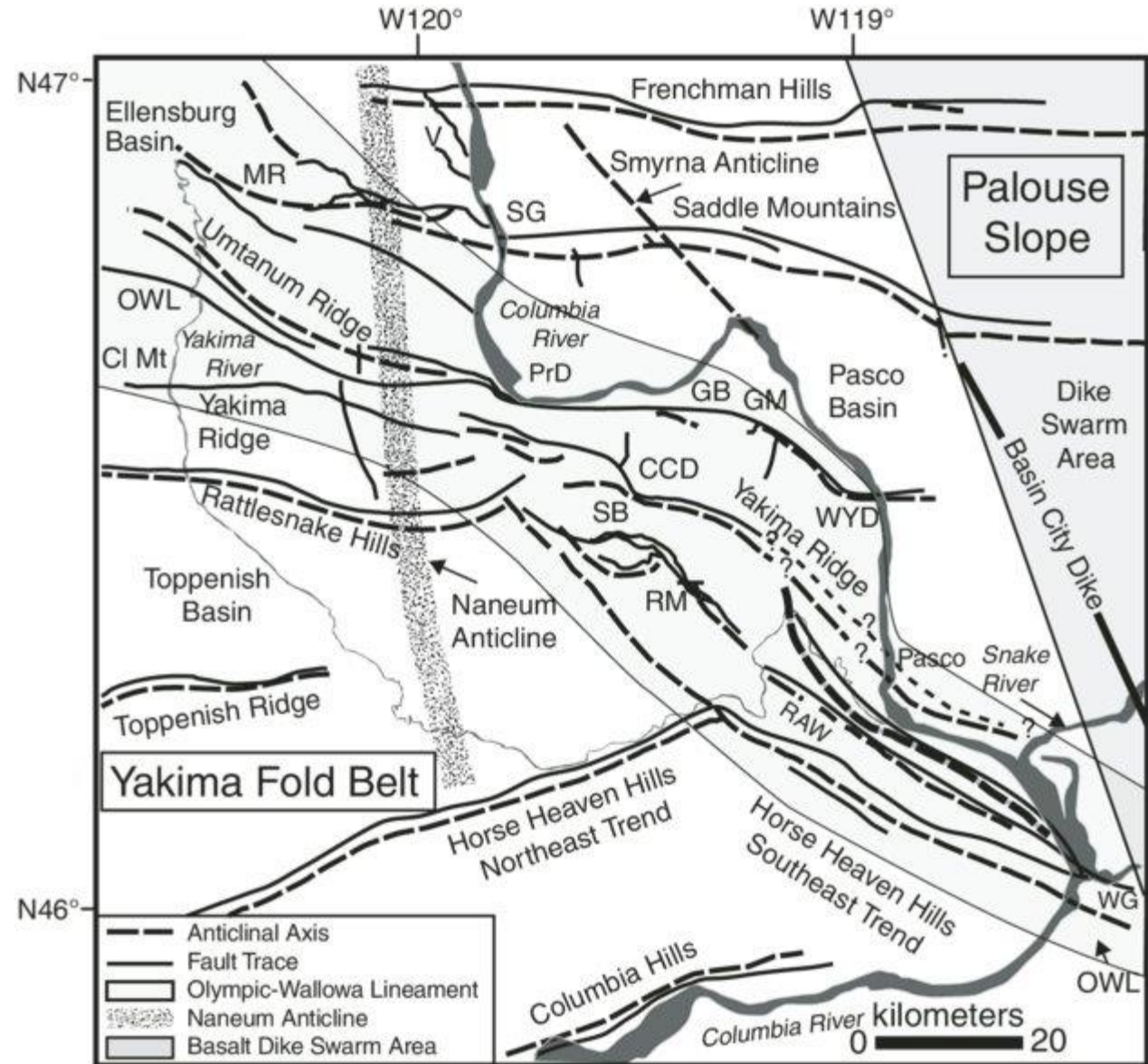
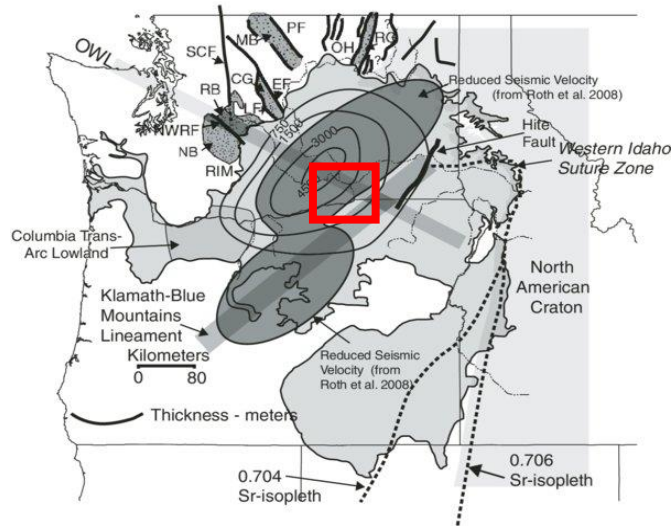
# Lake Ringold 8-2.8 Million Years (Oh River, Where Art Thou?)



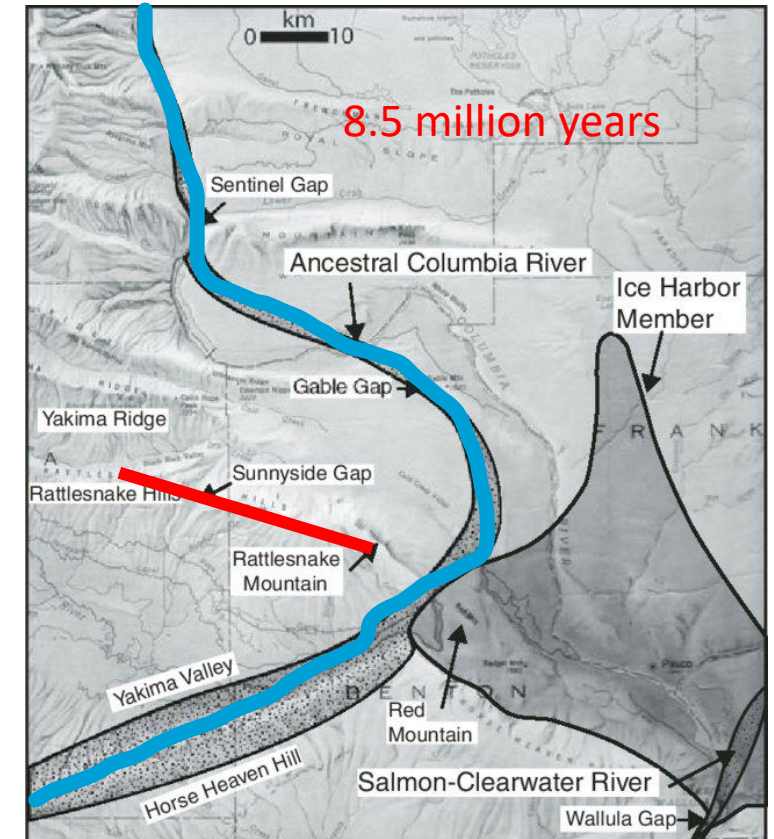
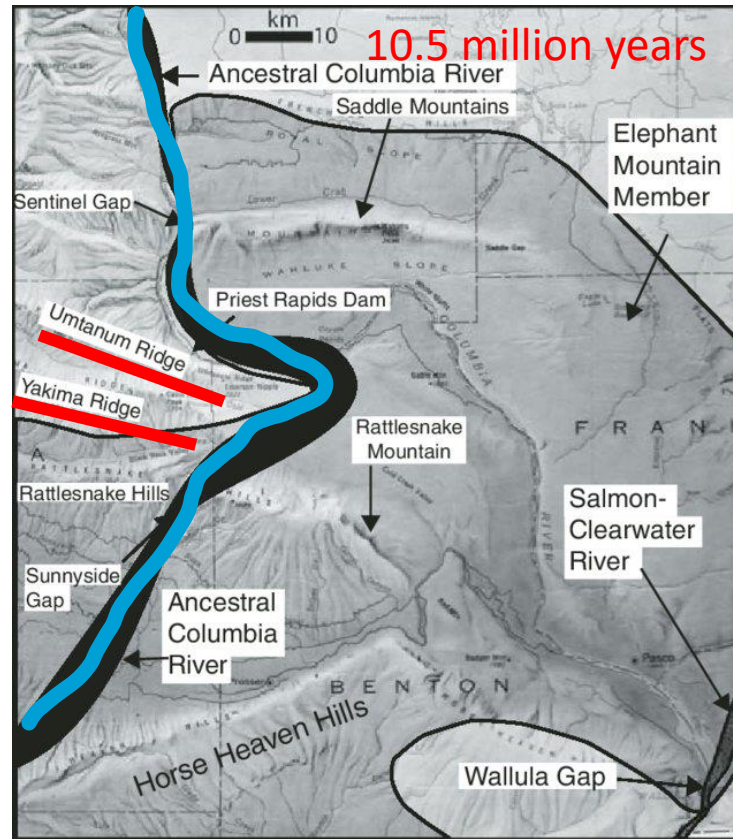
# Lake Ringold 8-2.8 Million Years (Oh River, Where Art Thou?)



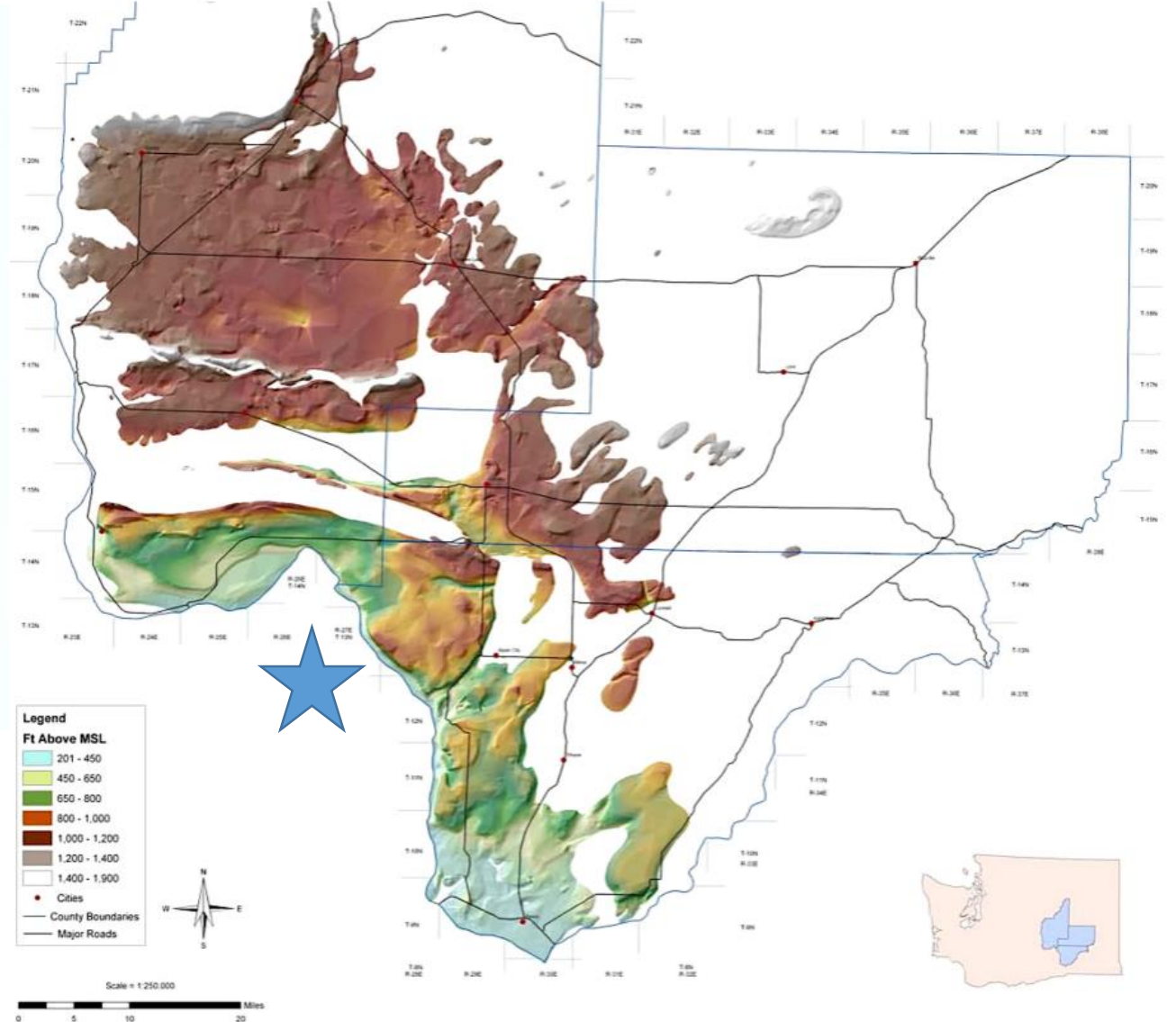
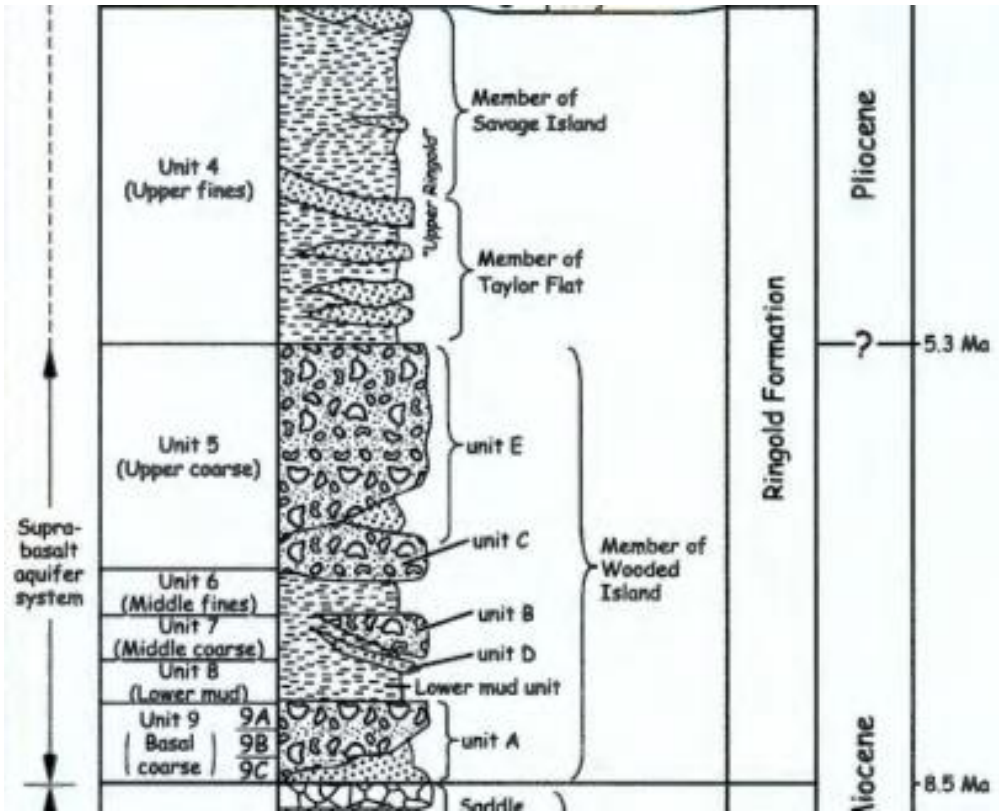
# Lake Ringold 8-2.8 Million Years (Oh River, Where Art Thou?)



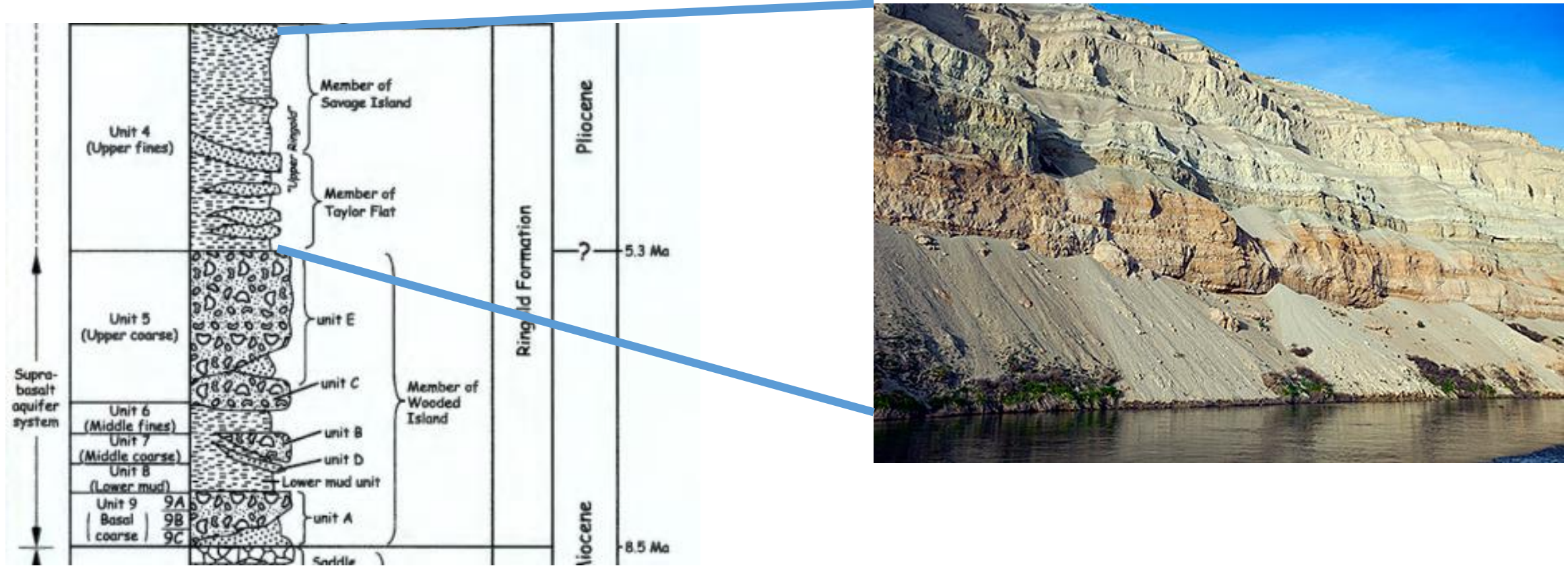
# Lake Ringold 8-2.8 Million Years (Oh River, Where Art Thou?)



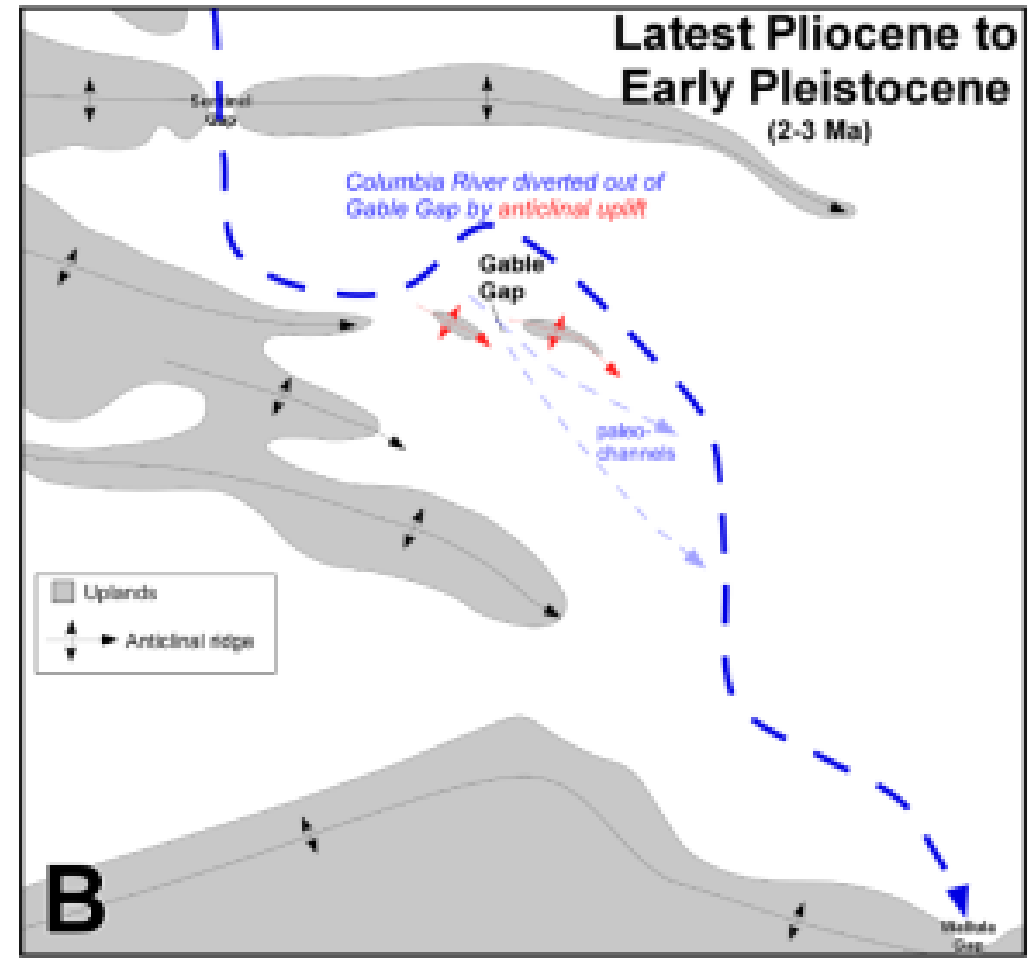
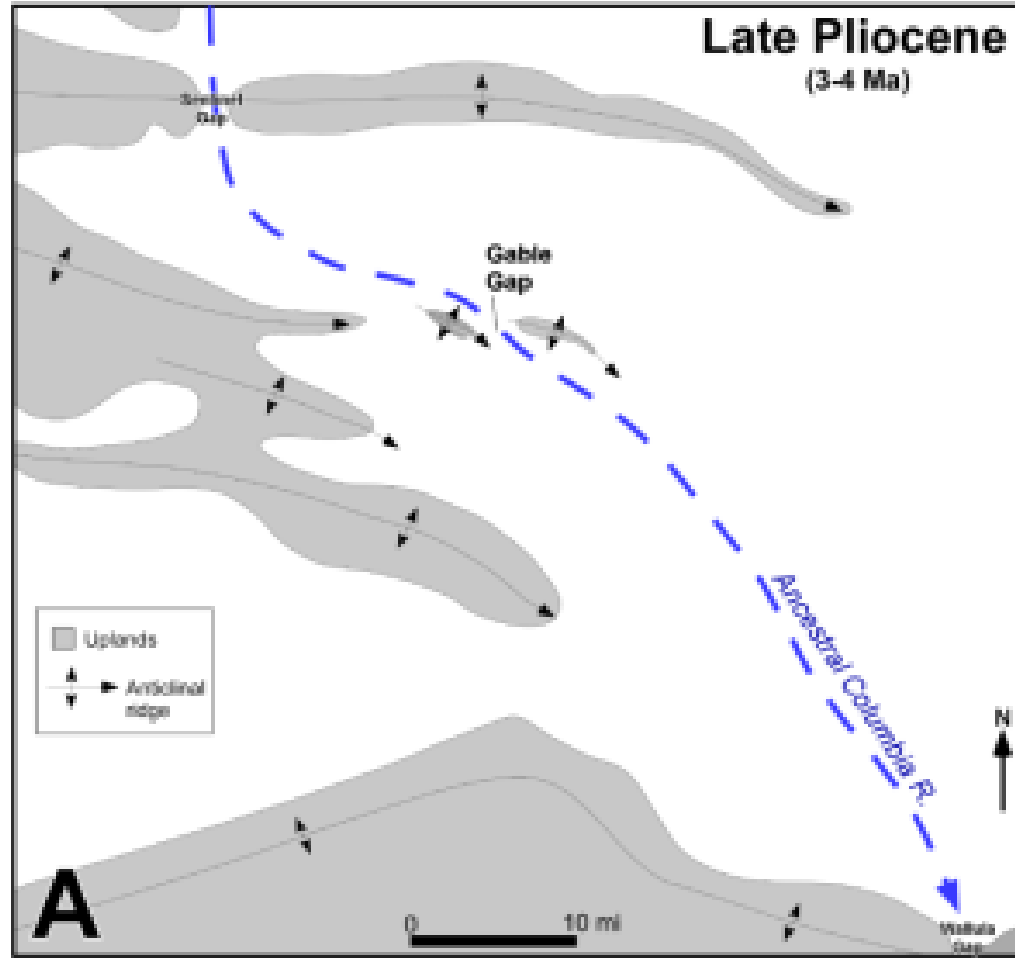
# Uplift Wins Some Battles (Twice Dammed)



# How Much Dirt is in the River, Anyway?



# Change the Channel (again)





# Lake Ringold 8-2.8 Million Years (Why aren't the White Bluffs at Hanford?)

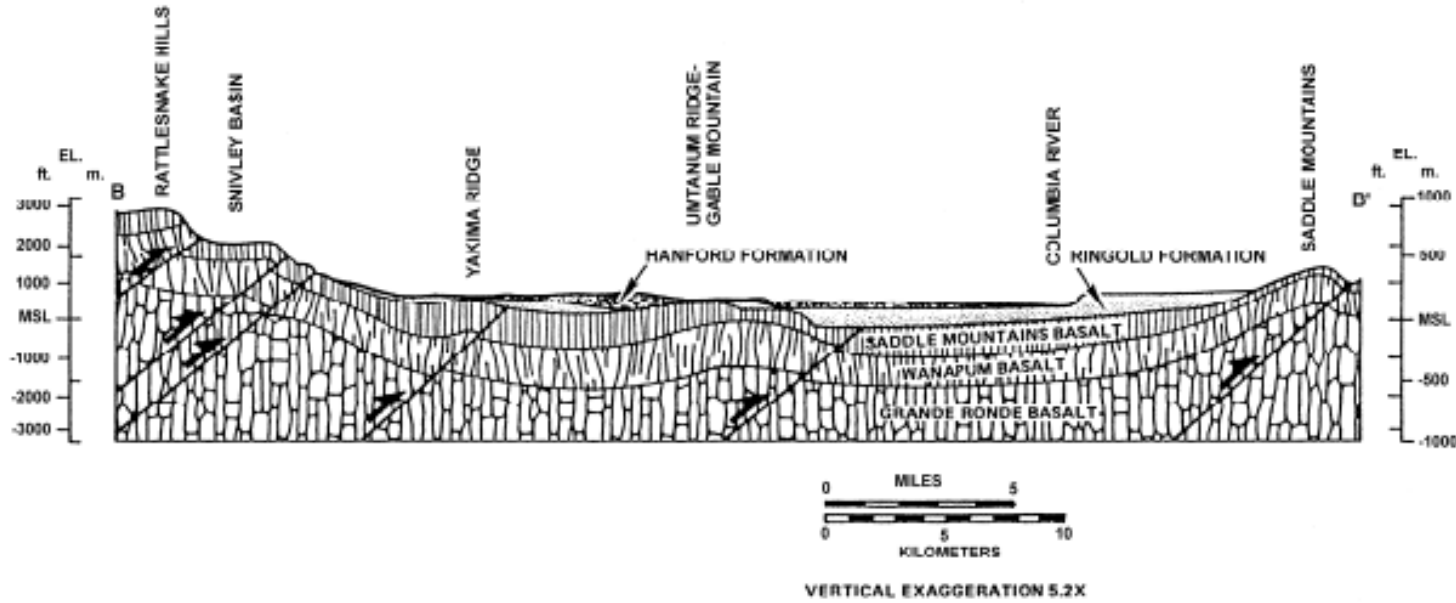


Figure 5.2. Schematic Cross Section of the Pasco Basin (see Figure 5.1 for location)

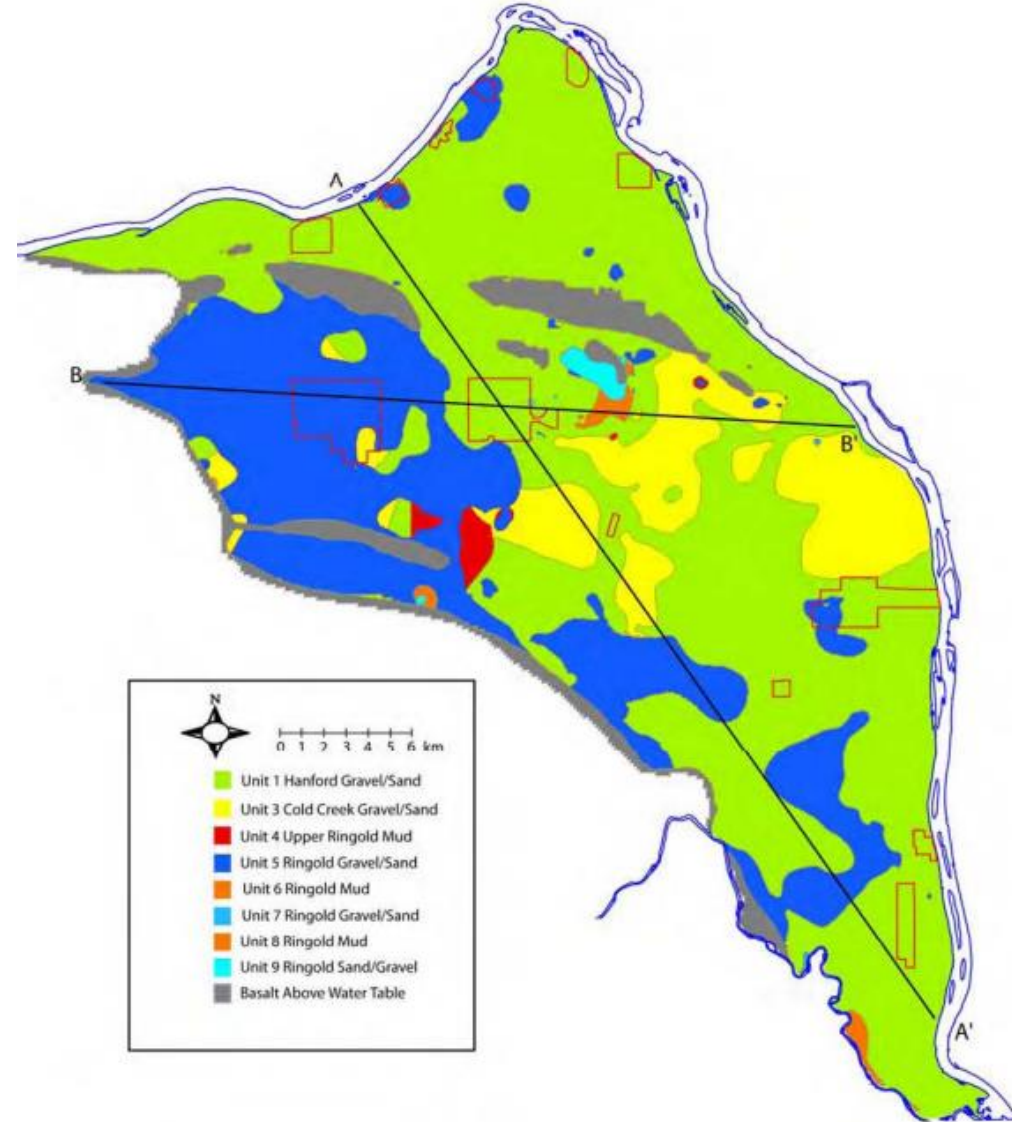
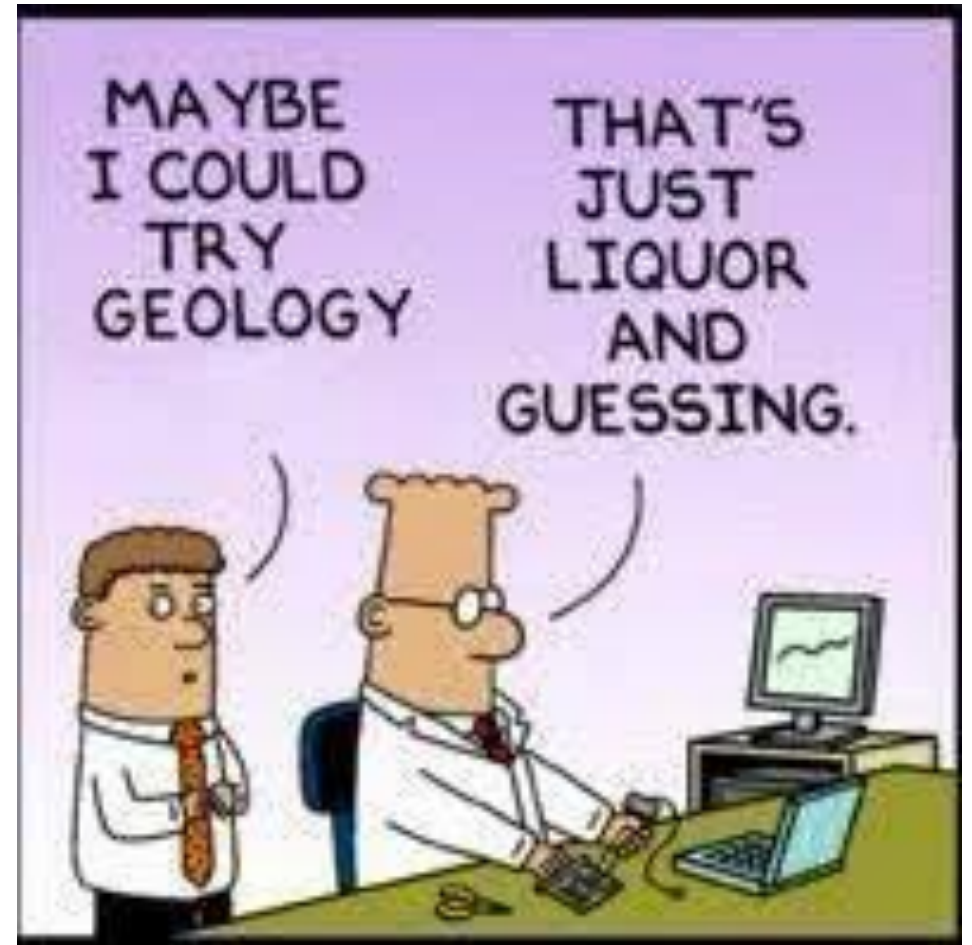
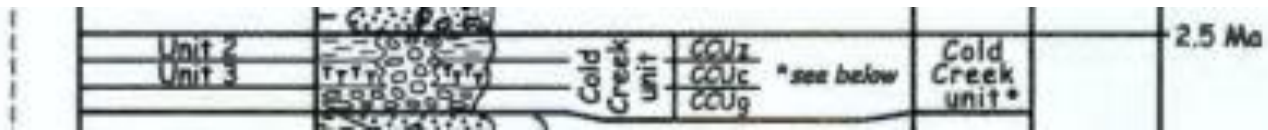
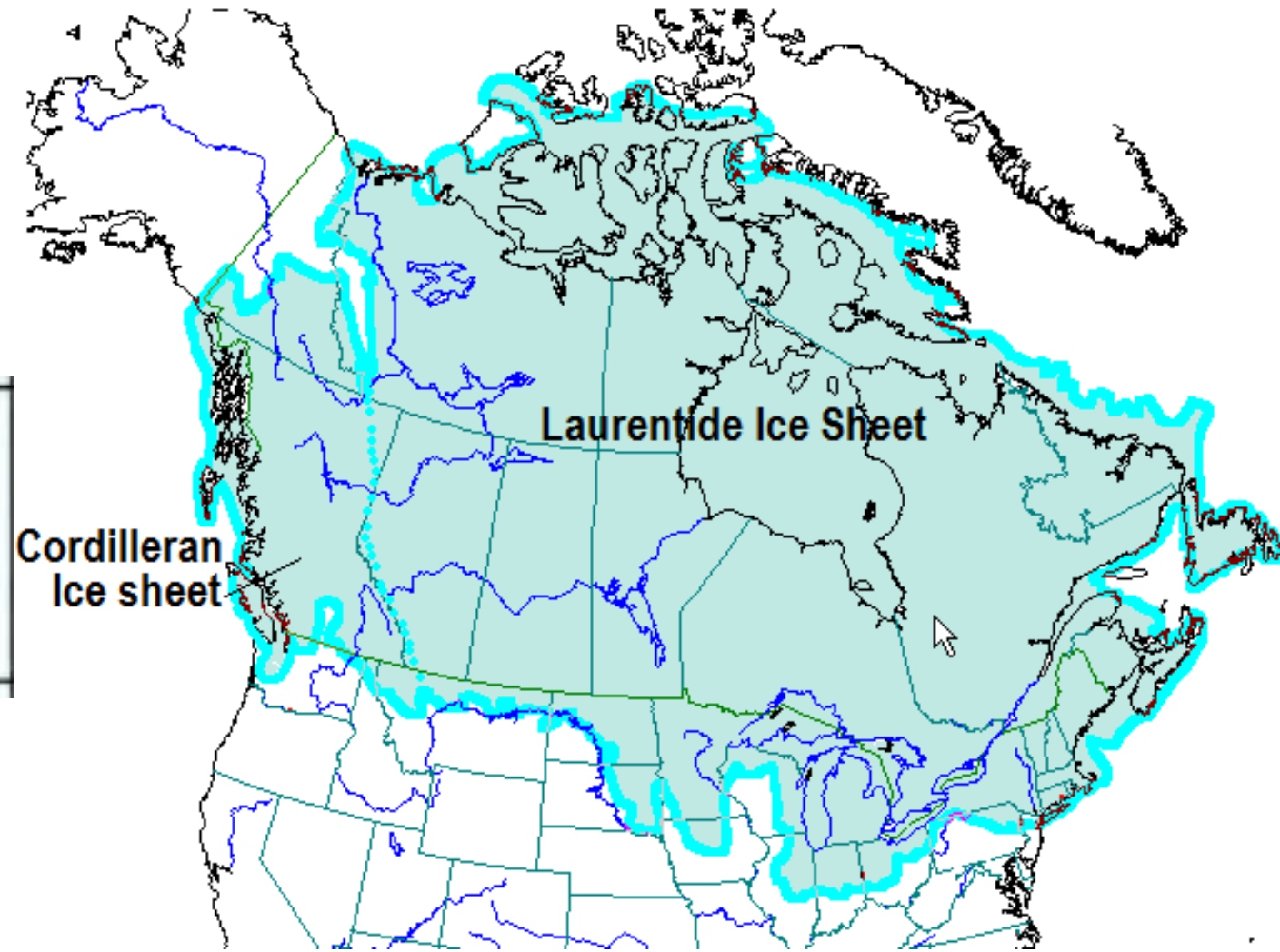
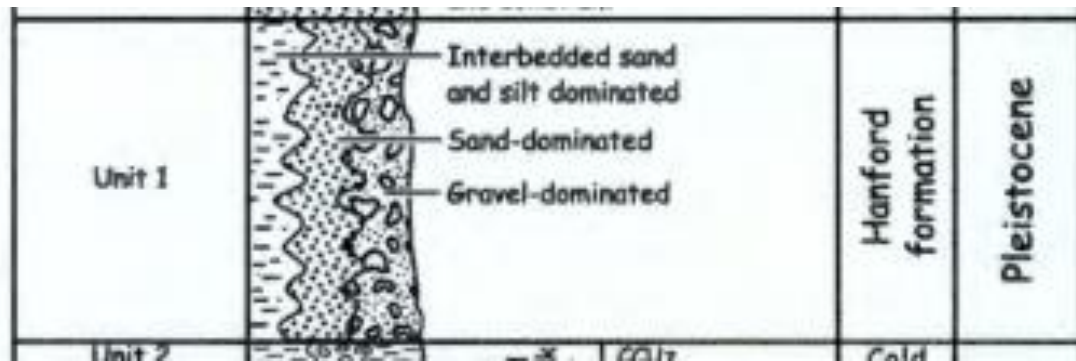


Figure 5.4. Distribution of Hydrogeologic Units at the Top of the Model (maximum water table)

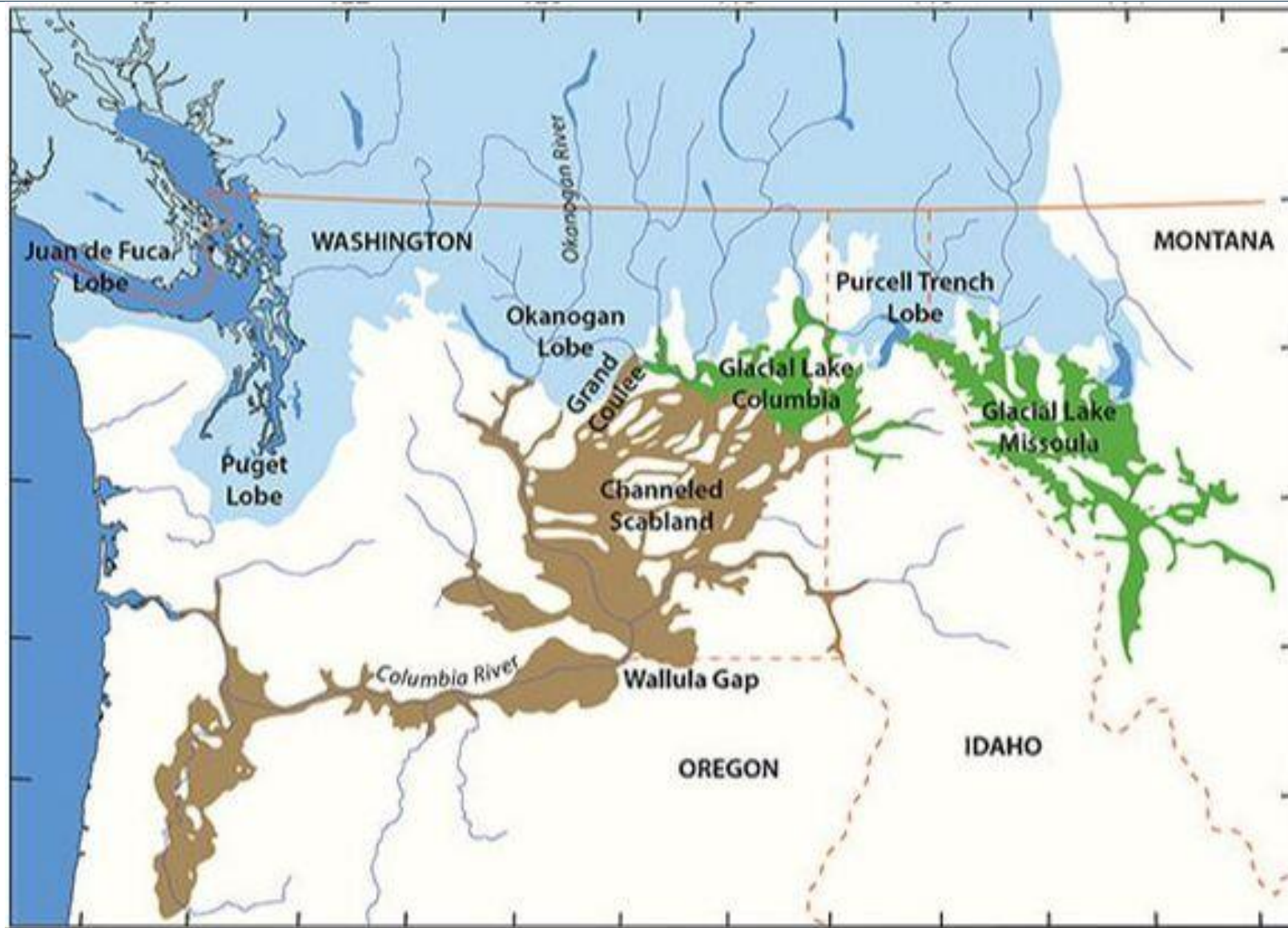
# 2.8-0.15 Million Years Ago (Error 404: Rocks not Found)



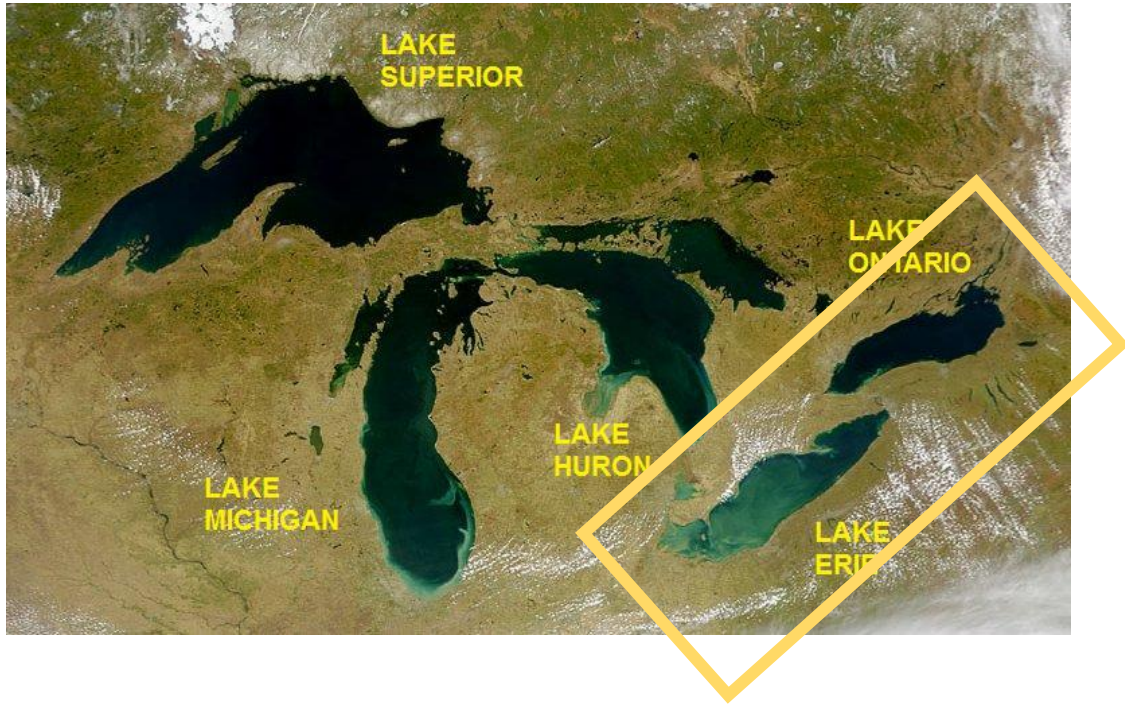
# Floods 2: The Big Chill



# Floods 2: Icebreakers



# Lake Missoula



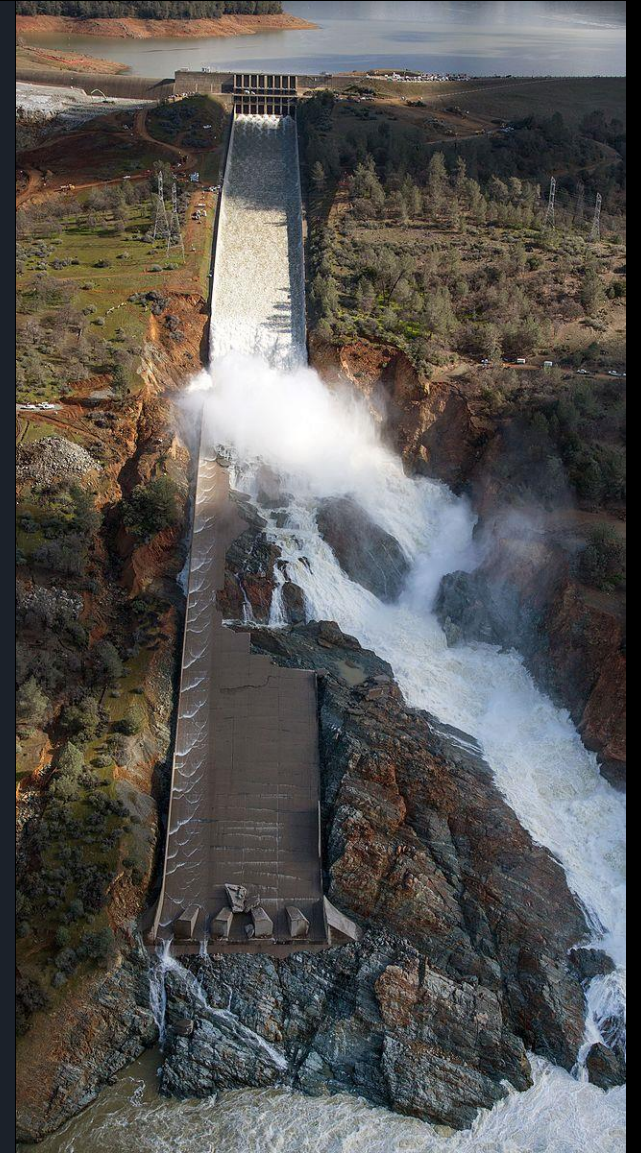
# When the Dam Breaks

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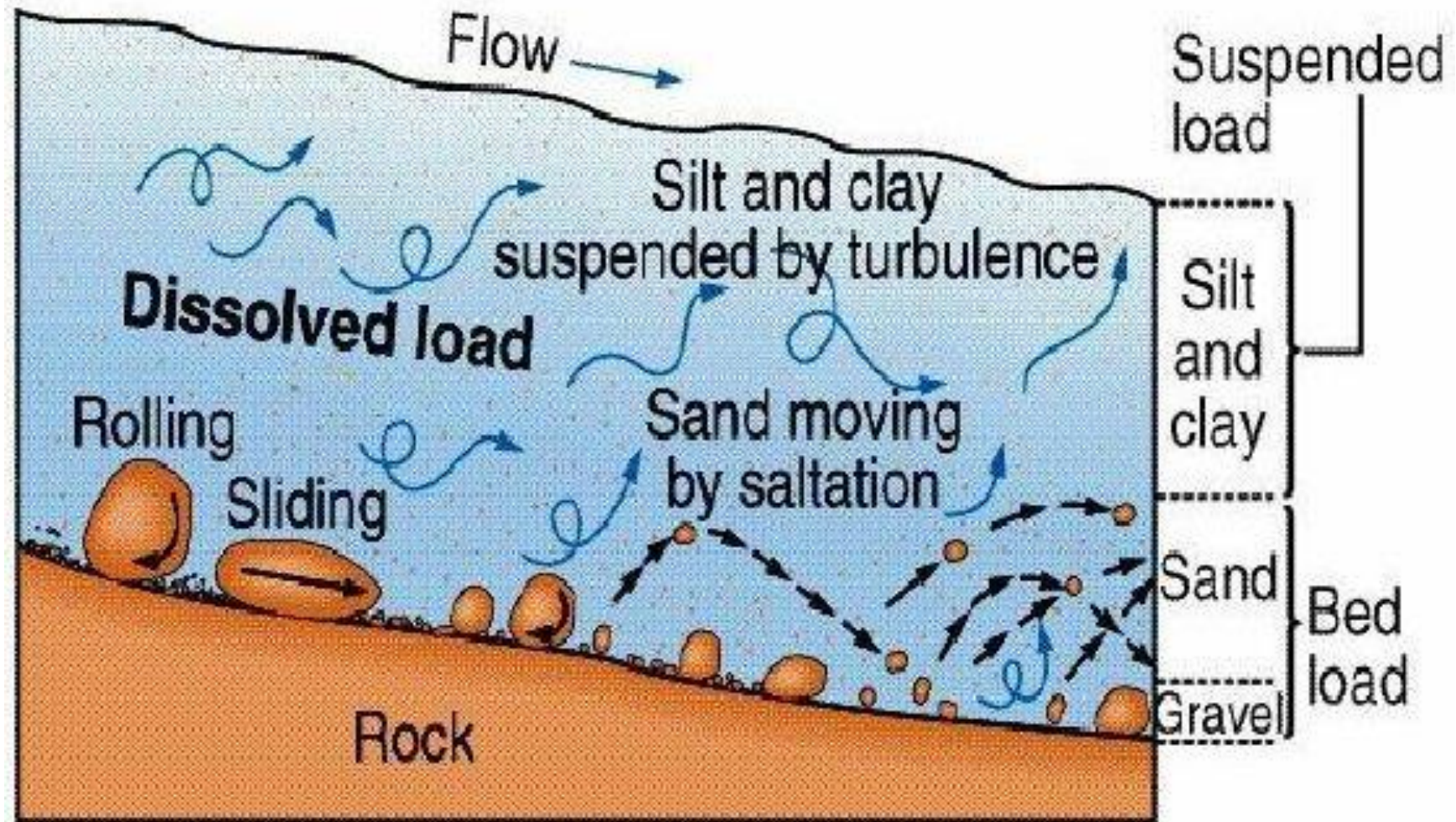




Why aren't the White Bluffs at Hanford?

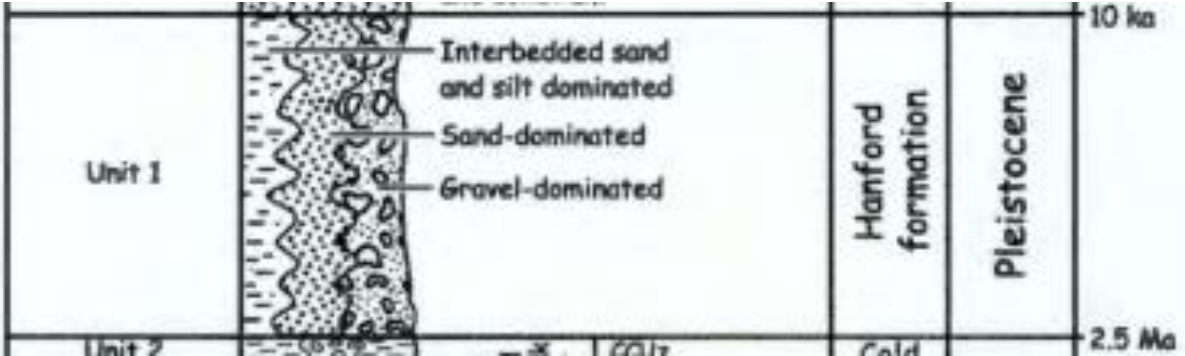
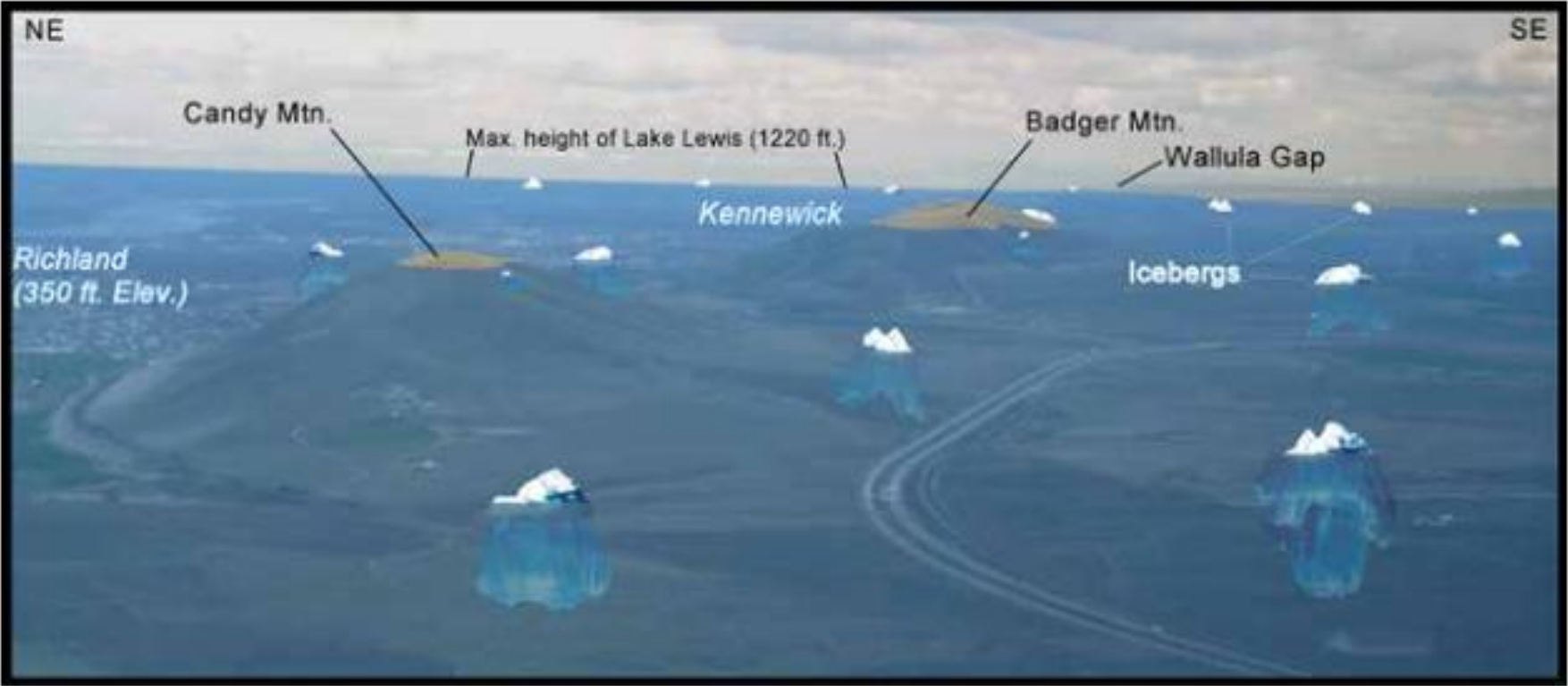


# Rollin' on the River





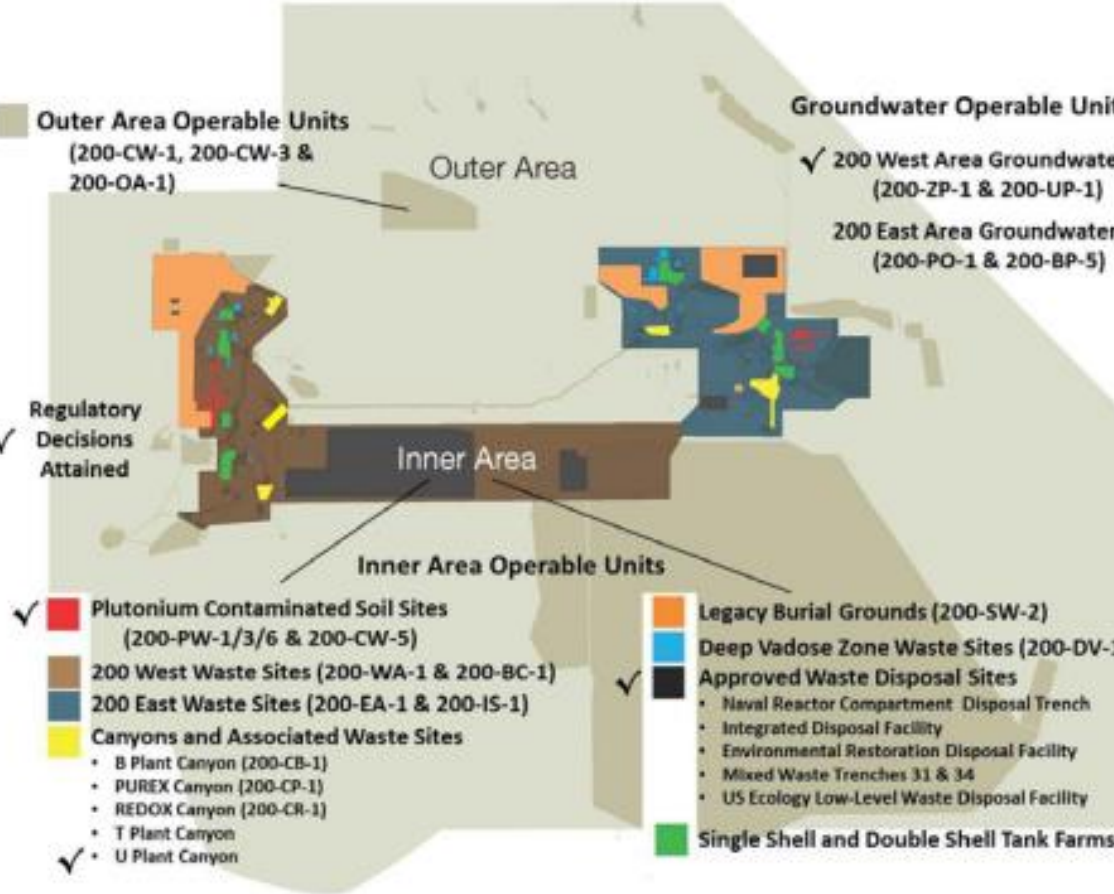
# Lake Lewis



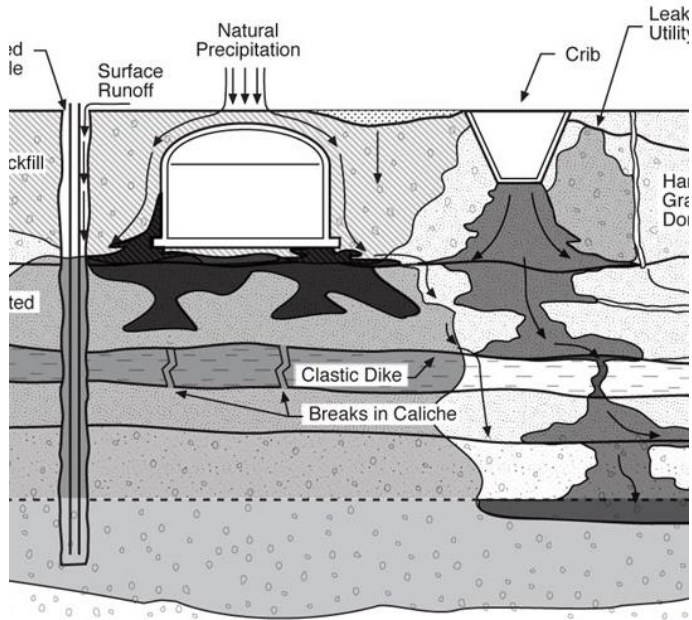
# Cracking Under Pressure



# The Next Million



# Below Hanford: A Complex Catastrophe



# Questions?

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# Resources

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Stephen P. Reidel, Victor E. Camp, Terry L. Tolan, John D. Kauffman, Dean L. Garwood, 2013. "Tectonic evolution of the Columbia River flood basalt province", The Columbia River Flood Basalt Province, Stephen P. Reidel, Victor E. Camp, Martin E. Ross, John A. Wolff, Barton S. Martin, Terry L. Tolan, Ray E. Wells <https://pubs.geoscienceworld.org/gsa/books/book/661/chapter/3807278/Tectonic-evolution-of-the-Columbia-River-flood>

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[https://www.researchgate.net/publication/268981775\\_The\\_late\\_Cenozoic\\_evolution\\_of\\_the\\_Columbia\\_River\\_system\\_in\\_the\\_Columbia\\_River\\_flood\\_basalt\\_province](https://www.researchgate.net/publication/268981775_The_late_Cenozoic_evolution_of_the_Columbia_River_system_in_the_Columbia_River_flood_basalt_province)

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<https://opentextbc.ca/geology/chapter/16-1-glacial-periods-in-earths-history/>

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