

ESC 115 Physical Geology

Test 3

Fall, 2012

The first 12 questions refer to the slides we will view together in class. Please use the space provided to answer the questions.

1. (4 pts) Define risk. How does the figure shown relate to that definition? How does it demonstrate an attempt to reduce risk?
2. (6 pts) How do earthquakes transmit energy? How do the differences shown help us locate the epicenter of an earthquake? Use a simple drawing, such as from a figure in the lab exercise, to illustrate how three readings are needed to plot the epicenter.
3. (6 pts) In the figure shown, yellow marks shallow earthquakes, green is intermediate depth, and red is deep earthquakes. Explain the pattern of earthquakes in area A and in Area B. An earthquake in which of the two areas is most likely to create a tsunami? You may draw as needed to help with your explanation.
4. (6 pts) Most earthquakes occur at the boundaries of tectonic plates. However, the New Madrid Fault Zone, beneath Missouri, was the site of a huge earthquake in 1811-1812. Why is the fault zone there? How do we use historical data both to estimate risk and to reduce it?

5. (6 pts) Oetzi, the *Ice Man*, was found in the Alps after being buried in the ice for 5000 years. What are three things we can learn from him?
6. (4 pts) The volcano shown is similar in shape to Mt. Ranier and Mt St Helens. How and under what plate tectonic conditions does it form? A shield volcano is generally much larger. Why?
7. (4 pts) The stream shown looks nothing like the Mississippi River nor Catfish Creek, both near here. Why does such a stream form?
8. (6 pts) When water slows considerably, the sediment it carries is deposited, as shown in the graph, where the vertical axis is stream velocity. When the water is moving faster, what are the three ways (one not shown) that it carries sediment? Explain.
9. (6 pts) What were three factors contributing to the 1993 Mississippi River flood?
10. (4 pts) What is the difference between relative and absolute sea-level? Explain how you would use your understanding of sea level to interpret the figure shown.

11. (**5 pts**) Interpret the graph shown. What are three ways urbanization affects flooding? What is urbanization?
12. (**4 pts**) Wave refraction is the bending of waves due to changes in velocity. Explain why the wave shown is bending and how that results in movement of sediment along the shore. You may draw a figure if needed.
13. (**6 pts**) Apply the three approaches to risk analysis that we discussed in class to decide whether or not children under 12 should be required to wear bicycle helmets when on public streets, parks, or sidewalks.
14. (**4 pts**) Describe four ways a stream changes from headwaters to mouth.
15. (**5 pts**) What is an estuary? What are three reasons it is particularly rich biologically? (Think what all biological organisms need to do.)

16. (4 pts) Each day the tide goes in and out. How does this affect what lives along the shoreline? Sometimes the tides are particularly high. How does that affect what lives along the shoreline? You may draw a picture to help you explain.
17. (6 pts) What are three causes of ice ages? Explain each.
18. (5 pts) What is something you've heard in the news recently that you listened to and understood differently because of studying geology?
19. (4 pts) In the videos we watched during this section, what were two things that stood out in your memory after seeing them?
20. (5 pts) What is one question you reviewed for this test that did not appear on it? Answer it.