Answer Key for Environmental Geology Lab 8

1. See Figure 1
2. South Texas, South Alabama & Mississippi; South Florida

3.

California	Current Plate Boundary
western Tennessee	Ancient Plate Boundary
South Carolina	Ancient Plate Boundary

4. See Figure 2
   Surprisingly High areas include: South Carolina, Middle Mississippi valley (around New Madrid Fault; eastern New England, and upstate New York
   Surprisingly Low area is central Oregon

5. Zero
6. 11
7. 4.01 to 5.60
8. Most of the South Texas earthquakes occur just South of San Antonio
9. Yes this is true, South Texas has a zero seismic risk and yet still has some minor earthquakes
10. Fracking and water injection associated with the petroleum industry
11. Near the town of Coalinga, California

12. Many people frightened. Near panic. Persons driving automobiles are disturbed. Trees shaken strongly, and branches and trunks broken off. Very heavy furniture moved and overturned. Slight damage in brick structures that were built to withstand earthquakes. Considerable damage in other masonry structures. Twisting or fall of chimneys, columns, monuments, factory stacks and towers.

13. Felt indoors by a few, especially on upper floors. Delicately suspended objects may swing.

14. Because the muddy sediment amplifies the magnitude of the surface waves.

15. Buildings that have wood or steel frames are a little flexible, and can endure the shaking due to an earthquake without serious damage. Buildings made of masonary, particularly unreinforced masonary (just stone with no steel framework to hold it up) tend to be stiff, and develop cracks, or even collapse entirely, during an earthquake.

16. As the ground shakes, pressure builds up inside the soil and is unable to escape quickly to the surface. Instead the pressure pushes the grains of soil apart, and reduces the grain-to-grain contact, which normally gives soil its strength. The result is something like a quicksand, which can make buildings sink into the soil or even topple over onto one side in extreme cases.

17. Offset along the San Andreas Fault.

18. Because San Francisco is built partially on soft bay fill whereas San Cruz is built on more solid bedrock. Additionally, more people live in San Francisco and therefore there are more structures that can be damaged.

19. The soft bay fill and improper construction practices.

20. On bedrock with safety features such as bolts or anchors to hold the first story in place on the foundation. Similarly, the walls on the upper levels can be tied more firmly to the roof, and bracing added to the walls to prevent them from shifting sideways.

21. Transform
22. Near the intersection of Tennessee, Arkansas, and Missouri

23. General panic. Damage considerable in masonry structures especially built to withstand earthquakes. Some wood-frame houses out of plumb or shifted off foundations. Conspicuous ground cracks. Underground pipes sometimes broken.

24. All people frightened and run outdoors. Many experienced difficulty standing. Noticed by persons driving automobiles. Rang large church bells. Heavy furniture overturned. Negligible damage to well designed and built buildings. Considerable damage to poorly built or badly designed buildings. Cracking of chimneys and masonry walls. Large amounts of fallen plaster and stucco. Numerous windows broken. Bricks and stones dislodged.

25. The damage extends over a much greater distance associated with the New Madrid fault as opposed to California

26. The unfractured bedrock in the central United States transmits seismic waves over a greater distance than in California

27. Ancient fault system