



## Crustal Boundaries

## Lab #22

**Discussion:** Earth's surface is divided into different sections that float on the asthenosphere. These sections or plates can include both oceanic and continental crust material. Many of the events that occur at or under the crust can be explained by the movement and interactions of these plates.

**Vocabulary:**

1. Lithosphere \_\_\_\_\_  
\_\_\_\_\_
2. Asthenosphere \_\_\_\_\_  
\_\_\_\_\_
3. Convergent plate boundary \_\_\_\_\_
4. Divergent plate boundary \_\_\_\_\_
5. Transform plate boundary \_\_\_\_\_
6. Subduction \_\_\_\_\_  
\_\_\_\_\_
7. Continental crust \_\_\_\_\_  
\_\_\_\_\_
8. Oceanic crust \_\_\_\_\_  
\_\_\_\_\_
9. Location of the Andes Mountains \_\_\_\_\_  
Location of the Baja Peninsula \_\_\_\_\_

**Objectives:** Learn to use the Tectonic Plates chart on the PS/ESRT page 5.

**Hypothesis:** Many events and features of the Earth (volcanoes, earthquakes, orogeny, ocean trenches, ocean ridges, and island arcs) can be explained by the theory of plate tectonics.

**Theory:** Earth's crust is divided into sections called plates. The plates float and move about on the asthenosphere. Interactions at the plate boundaries can explain many of Earth's events and features. Plates interact in three ways, convergent boundaries, divergent boundaries, and transform boundaries.

**Method:**

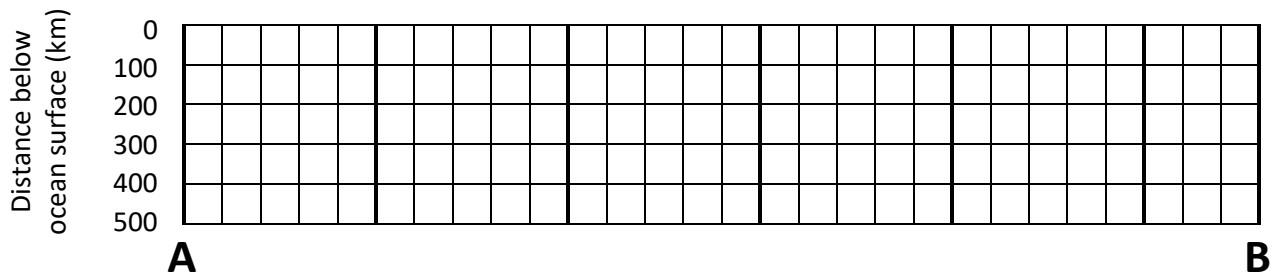
**Part A:** Use page 5 of your PS/ESRT to determine the type of plate boundary exists at each of the following locations. Use this key to identify the boundaries: C = convergent, D = divergent, and T = transform.

- |                             |       |   |       |
|-----------------------------|-------|---|-------|
| Mid-Atlantic Ridge          | _____ | Southeast Indian Ridge                    | _____ |
| Aleutian Trench             | _____ | Between the Pacific and Australian Plates | _____ |
| West Coast of South America | _____ | the West Coast of California              | _____ |

**Part B:**

1. On the graph below, plot the earthquake foci depths along line AB from the map on the facing page.
2. Connect the points with a smooth line.
3. Draw arrows to the right of **A** and the left of **B** that indicate plate movement on your graph. Be sure to make them bold enough that they are easy to see.
4. Determine which side of the graph represents oceanic crust and which side represents continental crust. Write “continental” and “oceanic” on the lines below the graph to denote each type of crust.
5. Use the PS/ESRT to determine the densities of continental and oceanic crust. Record those densities on the lines below the words “continental” and “oceanic” on your graph.
6. Using the densities you just recorded, draw a graphic in the space below the graph that shows the subduction that should be occurring at the plate boundary. Add arrows to the crust profiles that show the subduction and direction of movement.
7. Use the densities of each type of crust to predict where each plate will move when they collide. Draw one arrow below the density of each type of crust that shows the vertical direction of plate movement.

### Cross Section of South America



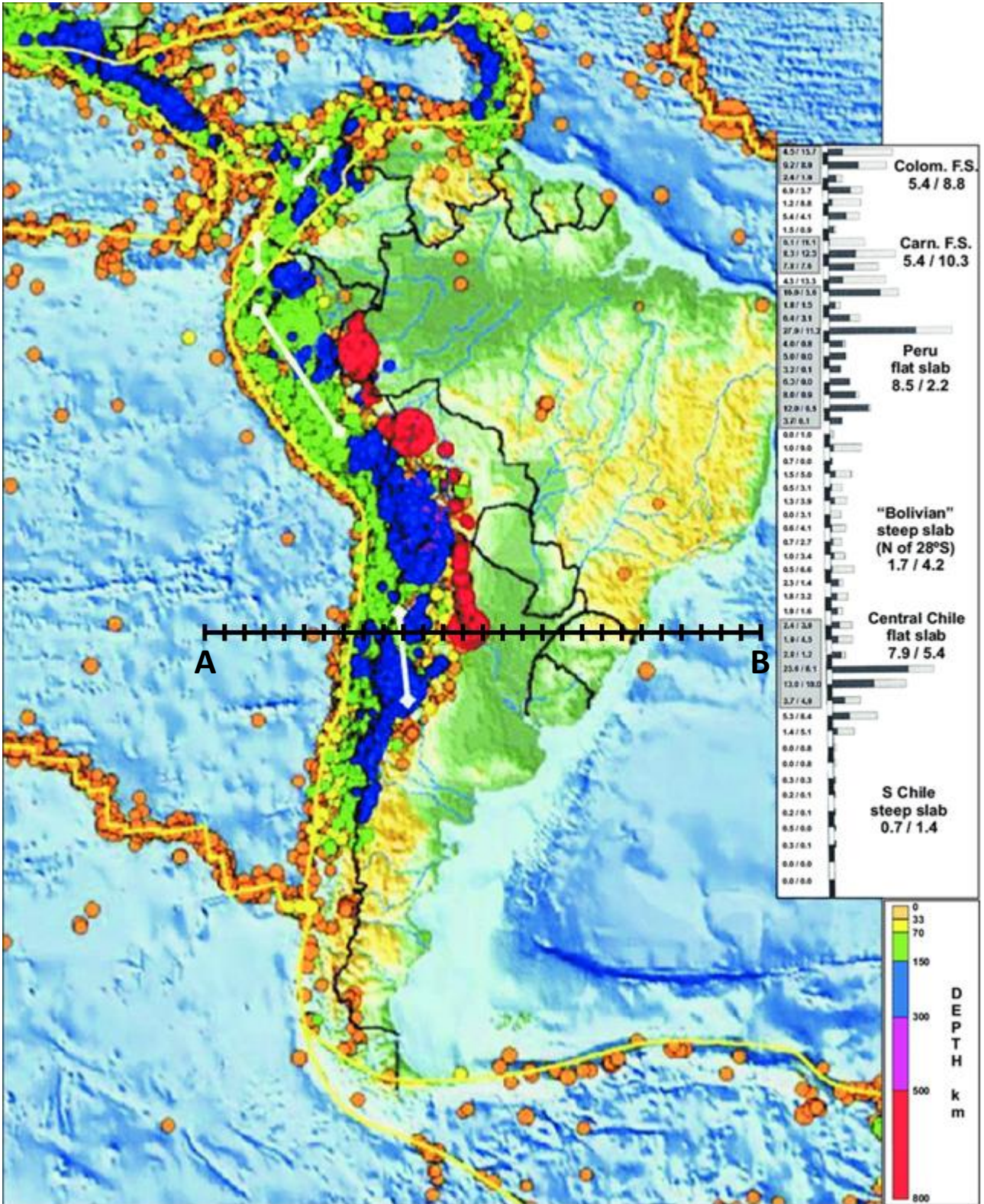
Graphic of  
Plates

Crust type                    \_\_\_\_\_                    \_\_\_\_\_

Density                        \_\_\_\_\_                        \_\_\_\_\_

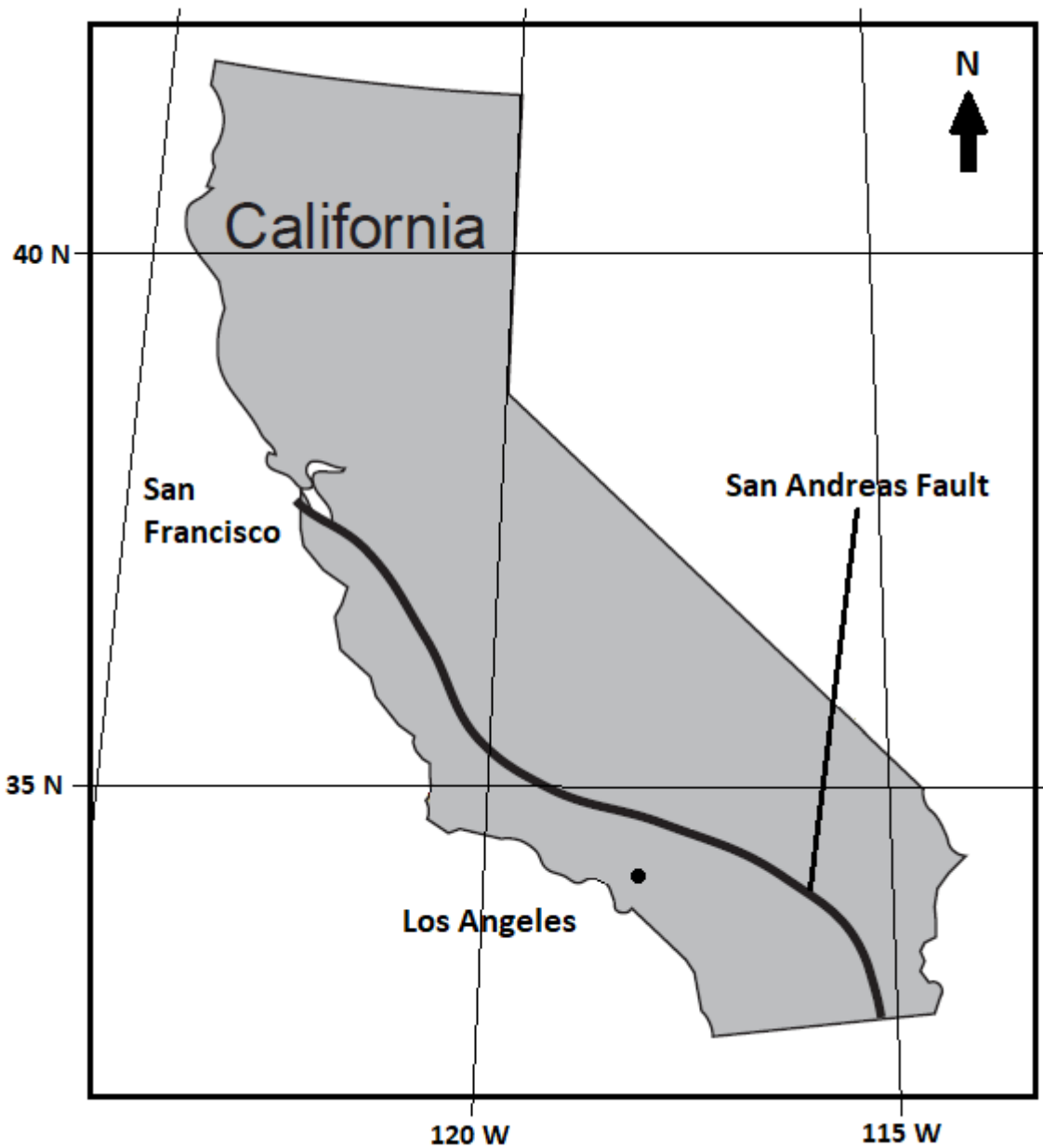
Vertical  
direction  
of plates

# South American Earthquakes



**Part C:**

1. On the graph below, draw arrows that show the movement at the San Andreas Fault.
2. What type of plate boundary occurs at the San Andreas Fault? \_\_\_\_\_
3. Which direction is the west side of the San Andreas Fault moving? \_\_\_\_\_
4. Record the latitude and longitude of Los Angeles \_\_\_\_\_
5. Given your answer to question 3, predict the latitude and longitude of Los Angeles at some future time.



**Conclusions:**

1. Using the cross-section of South America in Part B, describe the pattern of earthquake depth from west to east along line A-B.

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2. As the oceanic Nazca Plate collides with the continental South American Plate, what is happening to the two plates? Where are they going? (Which plate is being subducted?)

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3. What surface feature appears where the Nazca Plate and South American Plate collide?

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4. According to the Tectonic Plates map, where are most divergent plates located? (On continents, in the ocean, along boundaries between continents and oceans.)

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5. What type of plate boundary is associated with subduction? \_\_\_\_\_

6. What type of plate boundary creates new crust? \_\_\_\_\_

7. What type of plate boundary is associated with ocean trenches? \_\_\_\_\_

8. What type of plate boundary destroys crust? \_\_\_\_\_

9. In the space below, draw and describe each of the three types of plate boundaries.