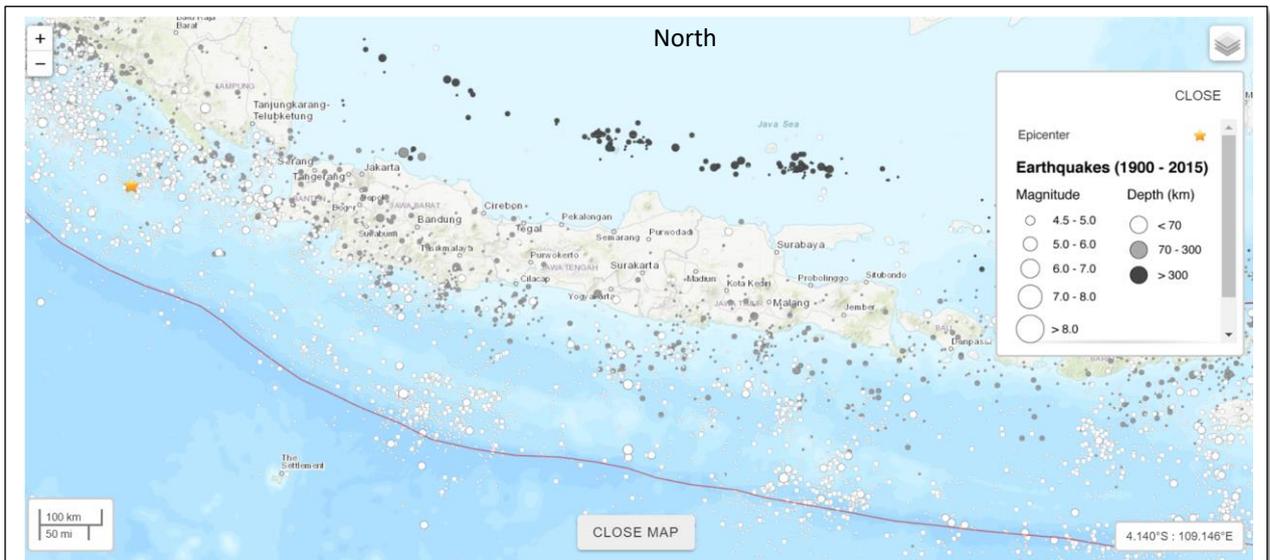




## Earthquakes and plate boundaries

Earthquakes occur most frequently on or near plate boundaries where stress and strain build up. These forces are released when the rock breaks (or fractures) and suddenly moves. The resulting force waves are earthquake waves. The point where the rock breaks is known as the focus of the earthquake. The point directly above it on the surface is the epicentre.

## Convergent boundary



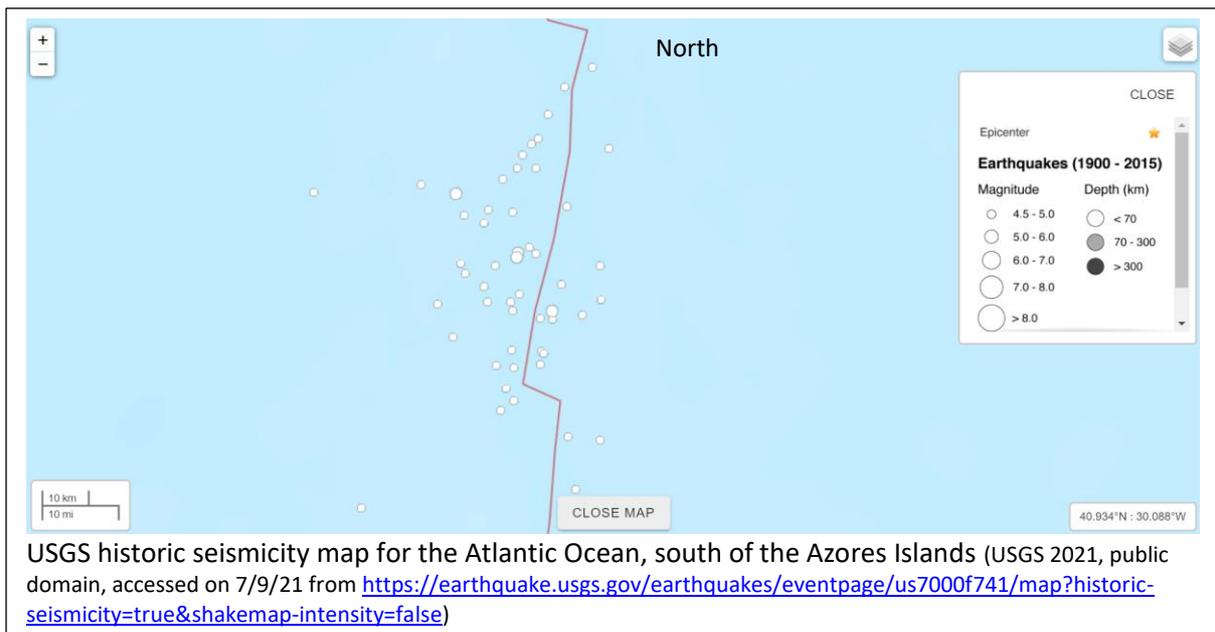
USGS historic seismicity map for Java (USGS 2021, public domain, accessed 7/9/21 from <https://earthquake.usgs.gov/earthquakes/eventpage/us7000f8rm/map?historic-seismicity=true&shakemap-intensity=false>)

1. The plate boundary is shown as a solid line on the diagram. This is a subduction boundary. Is the plate to the north or south subducting? \_\_\_\_\_
2. Explain how earthquake evidence helps you decide which plate is subducting. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
3. Approximately, how far from the boundary does the subducting slab produce the deepest earthquakes? \_\_\_\_\_



4. In the space below, draw a cross-section of the plate boundary, labelling North and including the land.

### Divergent boundary



1. Compare the seismicity at this divergent boundary with the convergent boundary on the previous page. Include the frequency, distribution, and depth of events. \_\_\_\_\_

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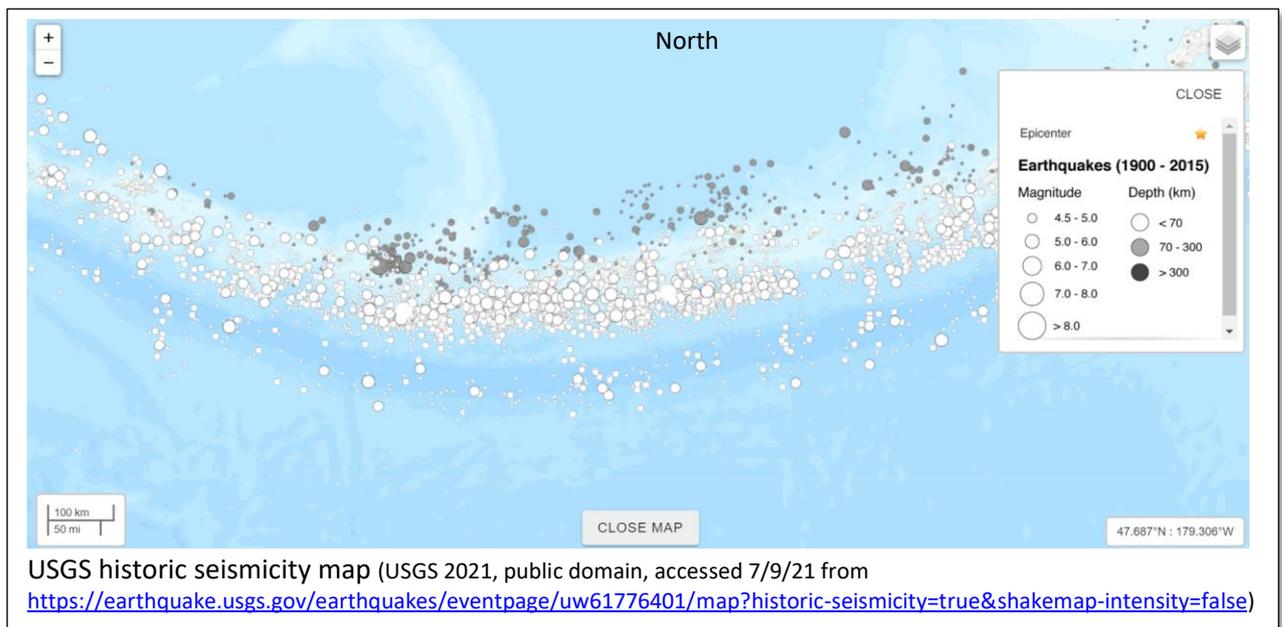
2. Explain why the divergent boundary does not have any deep focus earthquakes. \_\_\_\_\_

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3. Draw a labelled cross section of the divergent boundary below.

## Unknown boundary



1. What type of boundary is shown here? Explain your choice. \_\_\_\_\_

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2. Draw a line representing the plate boundary on the diagram. Explain why you chose this location. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
3. Draw a labelled cross-section of this boundary in the space below.

### Extension

Visit the Concord Consortium's Seismic Explorer at <https://seismic-explorer.concord.org/>. Zoom in on an area of interest and create a cross-section that can be explored in 3D. Note the differences in frequency and depth of earthquakes occurring at different plate boundaries. Can you tell the type of boundary from the seismicity?

### References:

Maps were captured from historic seismicity data from the USGS Earthquake monitoring at <https://earthquake.usgs.gov/earthquakes/map/>.

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