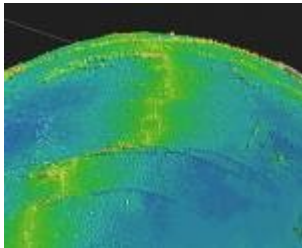


EAS193 – Introduction to Earthquakes
 Assignment 5
 Wednesday April 1, 2009

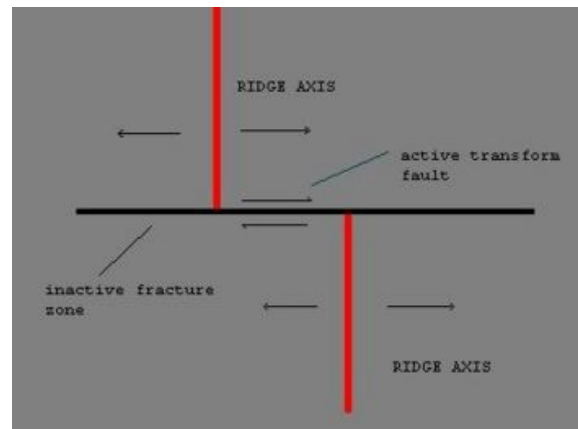
1. Some of the enigmatic features of the seafloor are the fracture zones that extend beyond the mid-ocean ridges. A topographic view of the ocean floor looks like.



These can be plotted in a map view as seen on the right.



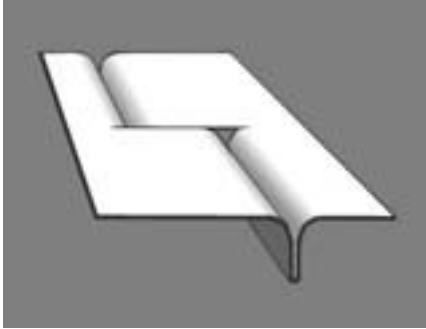
A closeup looks like the figure to the right:



The real problem is how this fits in with the idea of plate separation. Are these fracture zones active, and if so, why do we not see earthquakes on them? J. Tuzo Wilson created a simple exercise with a piece of paper.

This is a sketch of his model. The active regions are the spreading centers and the short linear segment

connecting them.



We would expect earthquake focal mechanisms to indicate normal faulting (separation of the plates) at the spreading centers and vertical strike-slip motion between the spreading centers. The fracture zones arise because of the different magma generation at the spreading centers. Interestingly, the magnetic signatures are offset too, as noted by Vine and Matthews.



Fred Vine's map of magnetic anomaly patterns off Vancouver, shaded to match the Geomagnetic Polarity Time Scale. The red areas are the Juan de Fuca and Gorda spreading ridges and represent the youngest sea floor material in that area. The colored stripes indicate periods of normal magnetism.

Assignment 2: Use a scissors to cut the page as indicated. Fold where indicated. The horizontal lines, stars and dots represent magnetic stripes indicating age. The vertical dashed line would be the fracture zone. (This is the last page of this handout)

Question: Is there any contradiction between seafloor spreading and the production of topographic and geophysical features on the seafloor?

Question: Who was J Tuzo Wilson?

Question: What was his contribution to plate tectonics?

J. Tuzo Wilson's Puzzle

