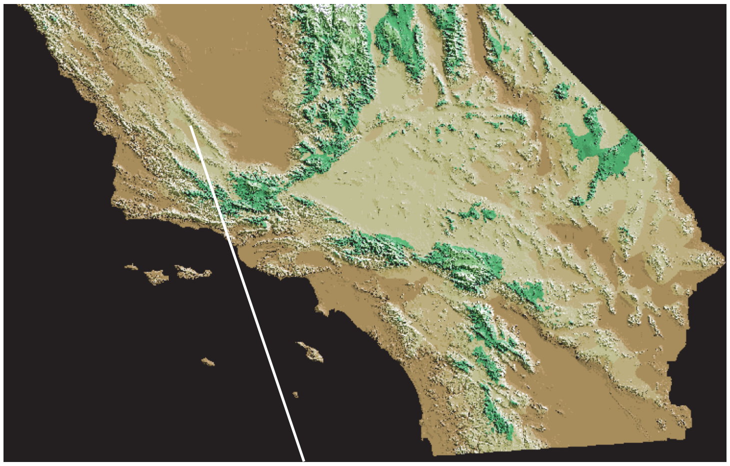
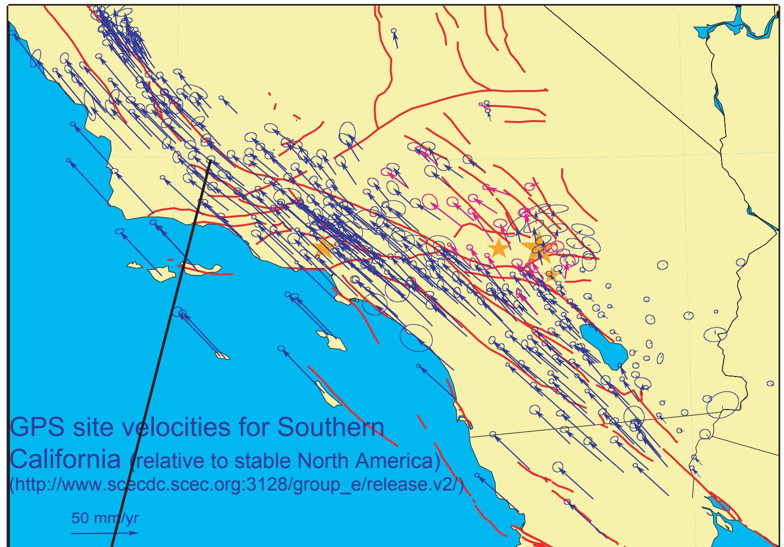
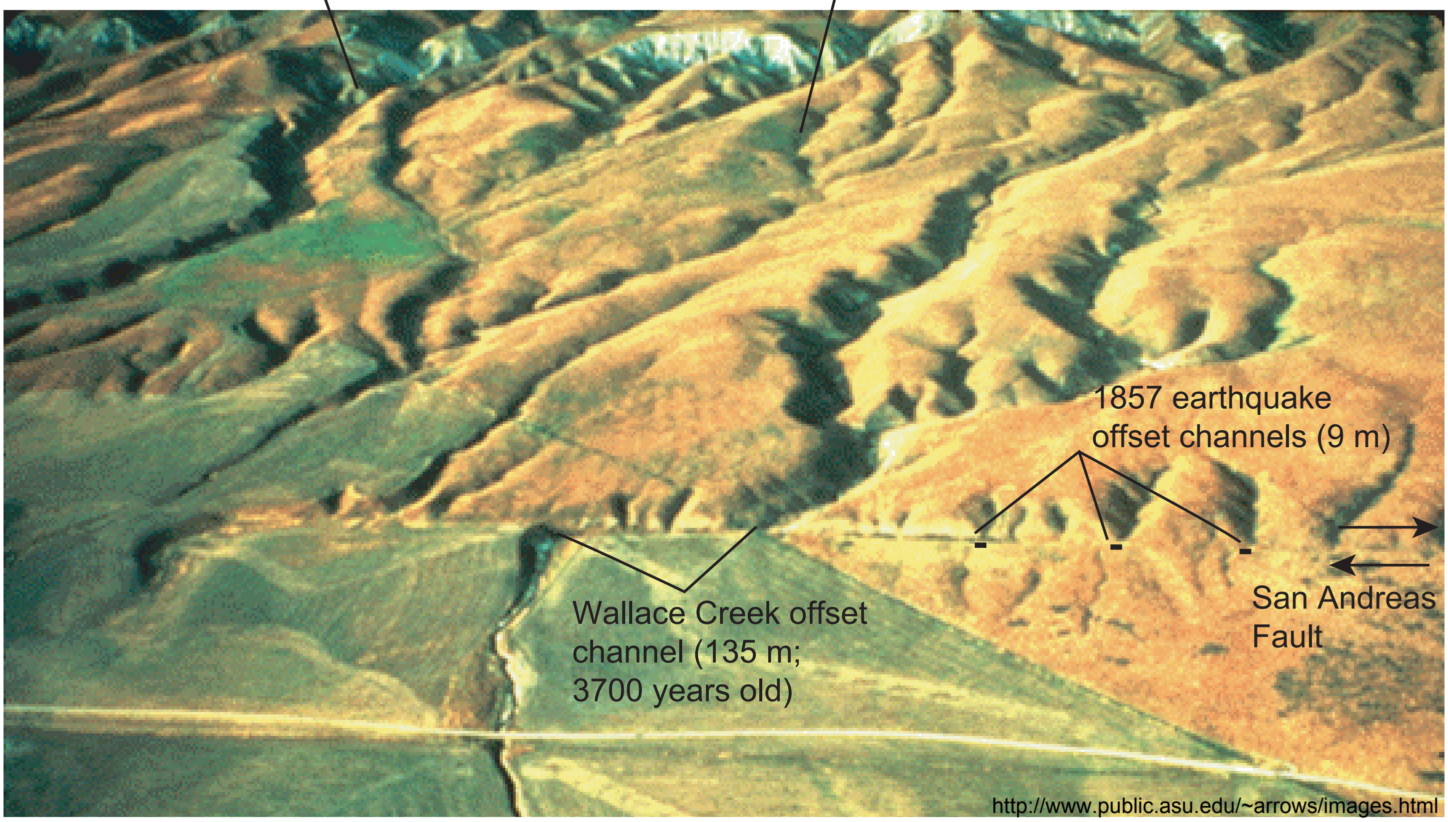
Long and short term deformation along the San Andreas Fault System



Shaded relief image of Southern California
(http://wwwflag.wr.usgs.gov/USGSFlag/Data/maps/CaliforniaDEM.html)



GPS site velocities for Southern California (relative to stable North America)
(http://www.scecdc.scec.org:3128/group_e/release.v2/)



The above photograph is a view toward the northeast over a part of the California Coast Ranges. It is a world famous locality for studying the San Andreas Fault (SAF) of California. It preserves records of both long term motion along the SAF (Wallace Creek) and short term (1857 earthquake).

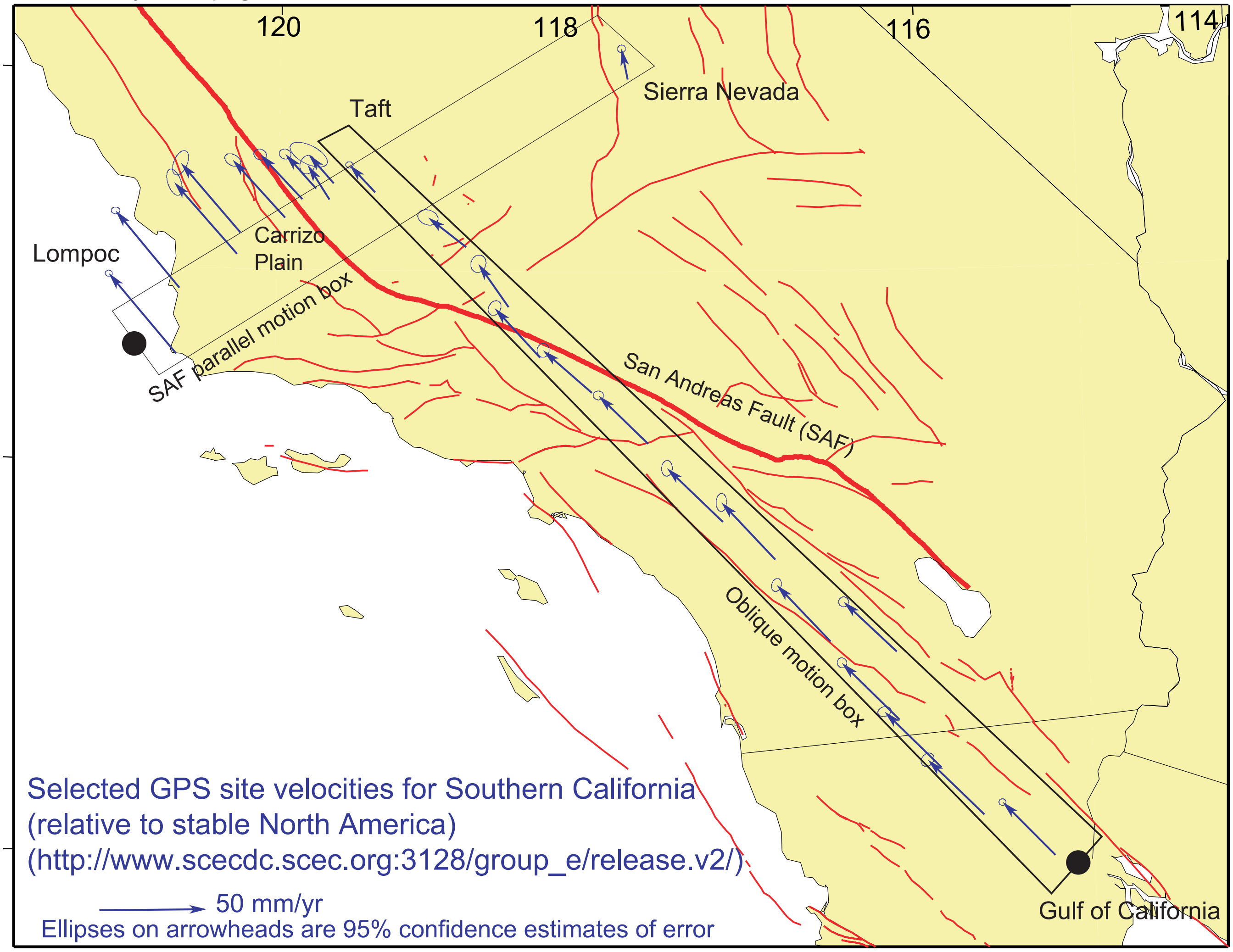
What is the average rate of motion defined by the offset at Wallace Creek (offset/age)?

At that rate, how long will it take to build up the offset that occured in 1857?

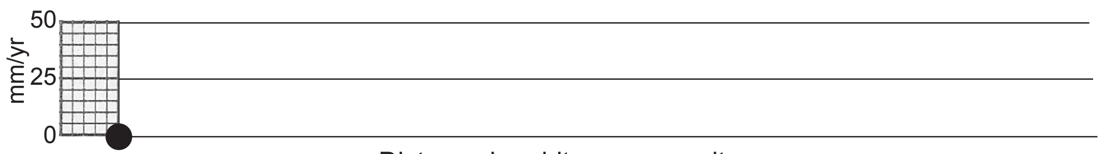
When would you expect the next earthquake to return if it were regular and represented by the 1857 earthquake?

(Come back after page 2): How does the above long term rate compare with the short term one from GPS measured motions that you determined on the reverse side (velocity difference between the Sierra Nevadas and Lompoc)?

NAME:_______________________________________



PLOT: SAF parallel motion

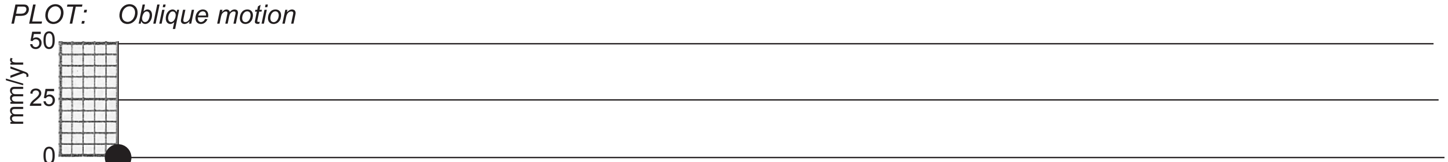


Distance in arbitrary map units

Where is steepest gradient of motion? Why do you think it is there?

What is the velocity difference between the Sierra Nevadas and Lompoc? You need this answer for the other side.

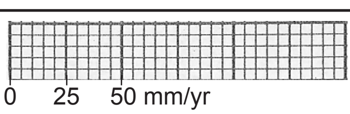
PLOT: Oblique motion



Distance in arbitrary map units

Where is steepest gradient of motion? What kind of faults and earthquakes do you expect there?

What is the velocity difference between the Gulf of California and Taft?



Tear or cut these rulers off and use them to measure the velocity of the vector and the relative positon along the profile (I gave you an extra; that is why there are two).