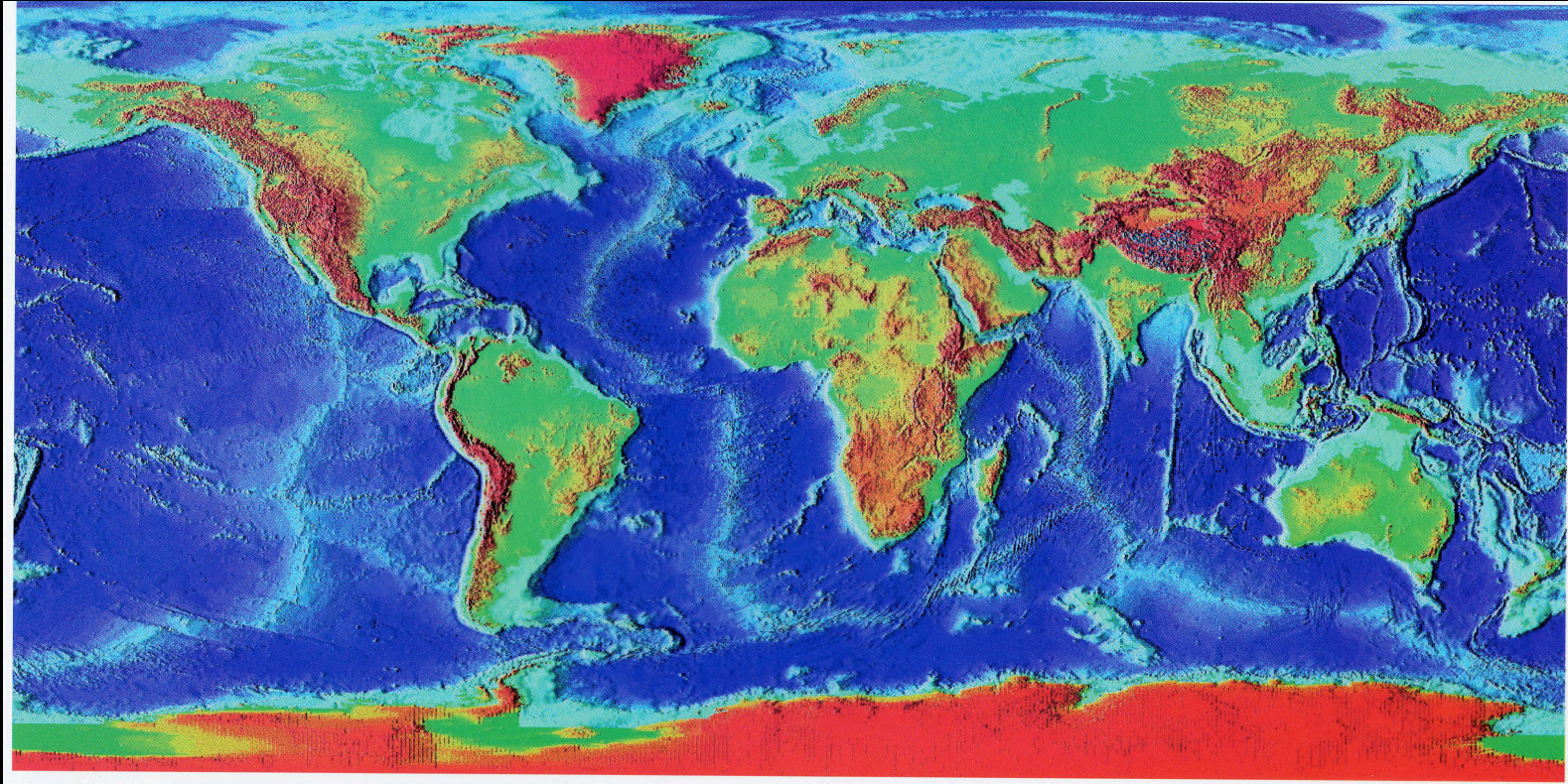
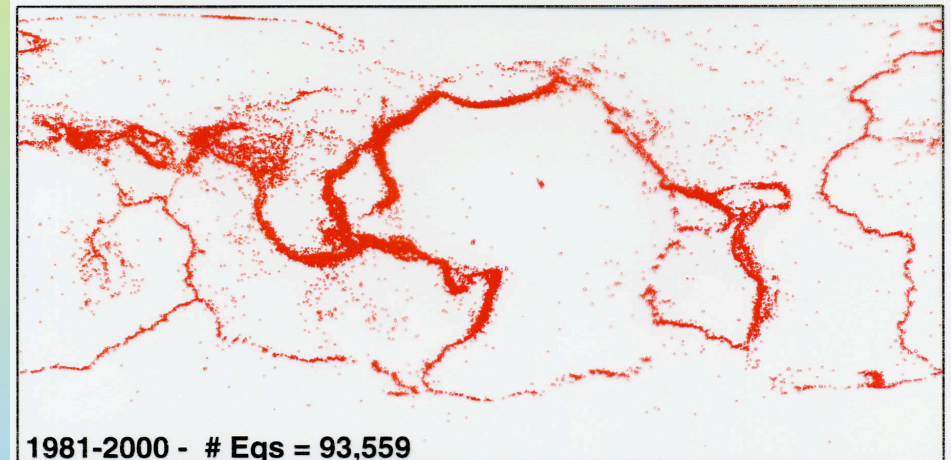
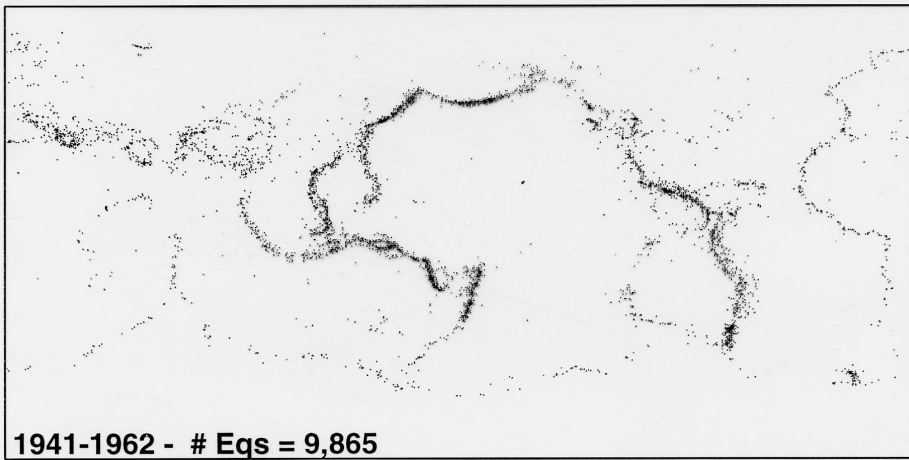
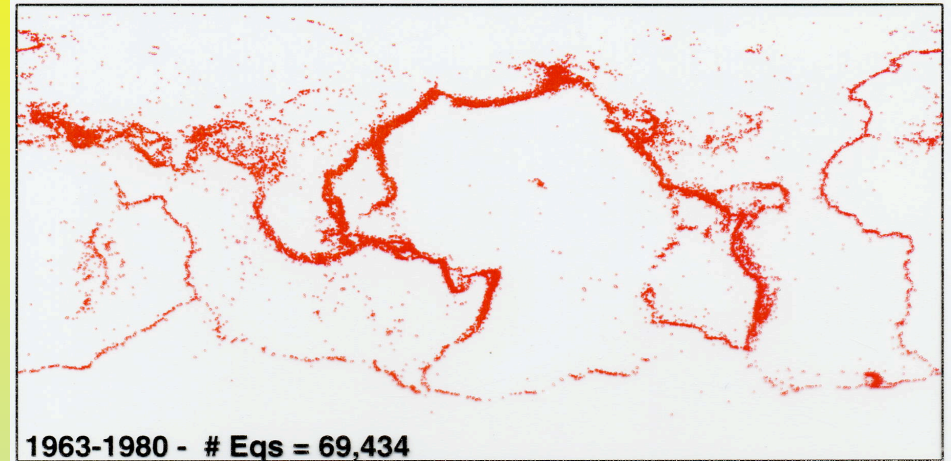
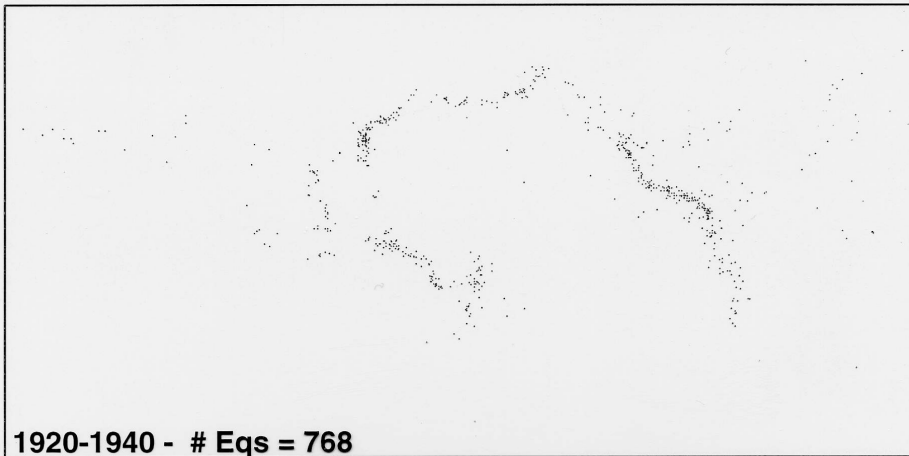


Earthquakes, volcanos, and plate tectonics

Professor Charles DeMets
Department of Geology and Geophysics
Univ. of Wisconsin-Madison



Earthquakes before 1963 (left) and after 1963 (right) above depths of 40 miles



I study earthquake faults using precise GPS position measurements.

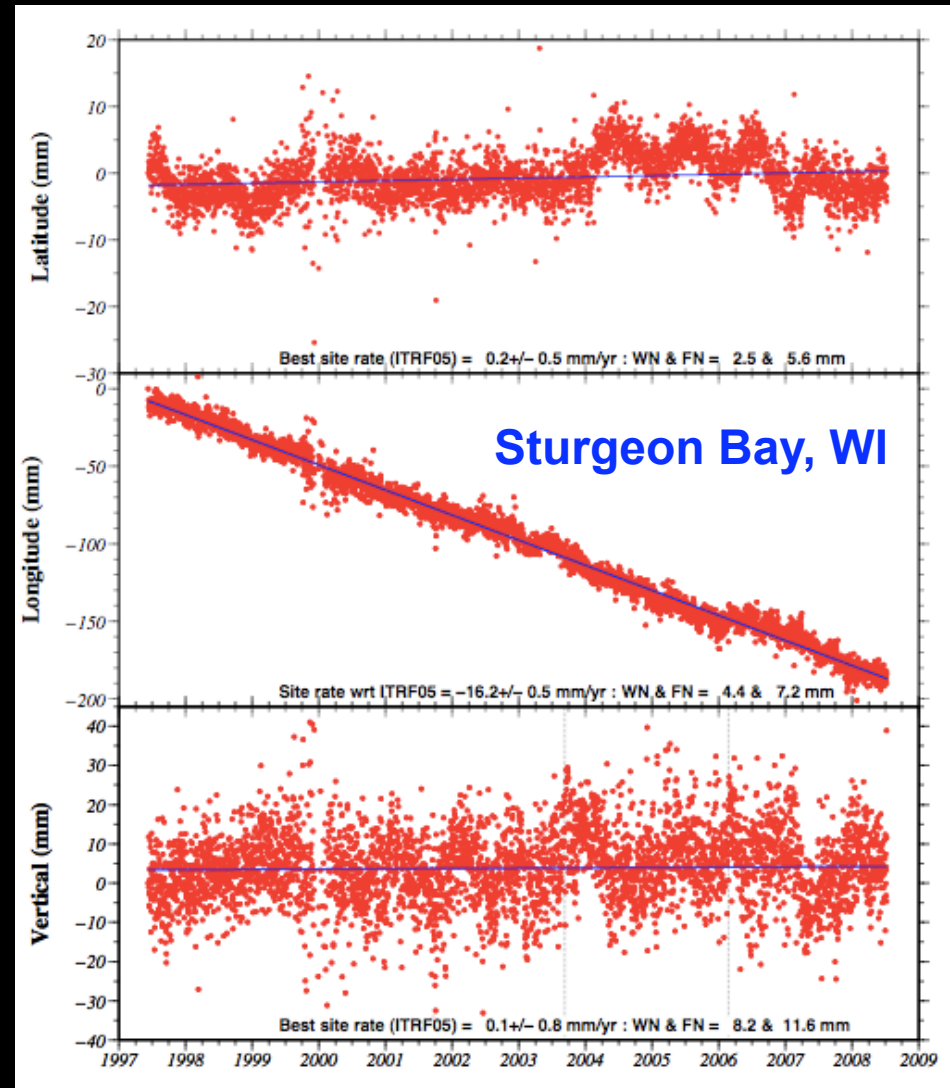
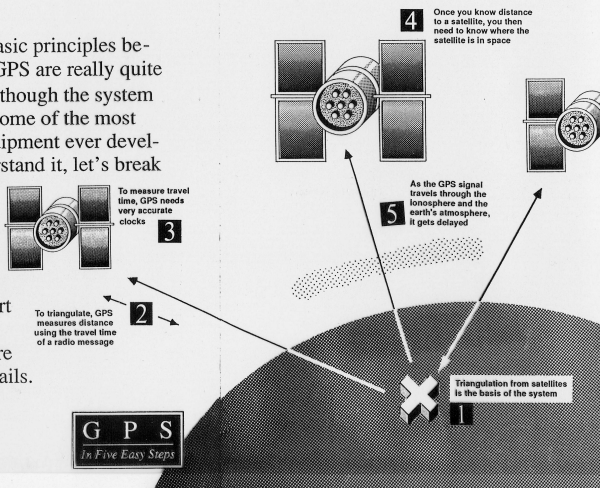


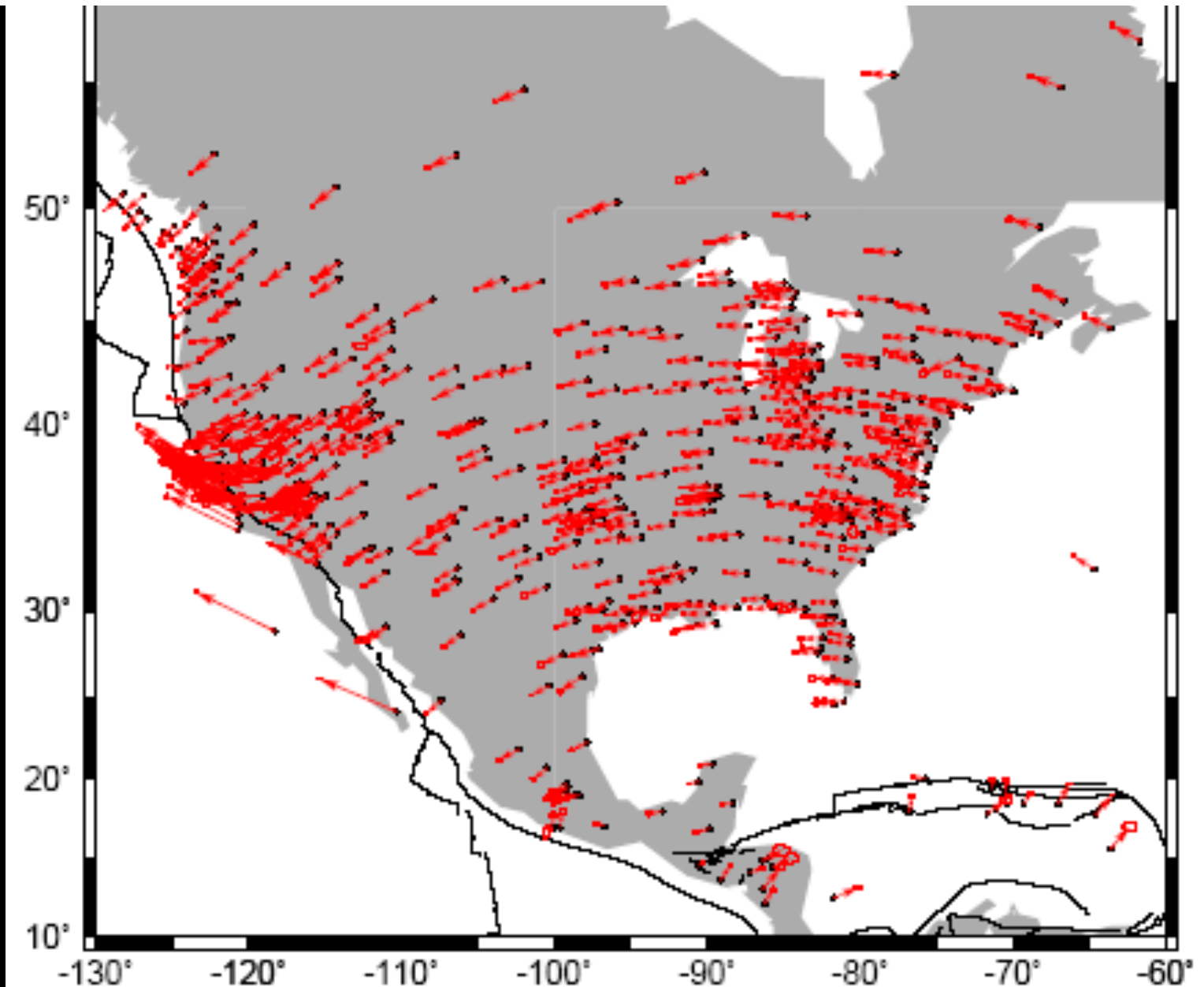
Using GPS tracking to monitor plate movements



How GPS works. In Five Easy Steps.

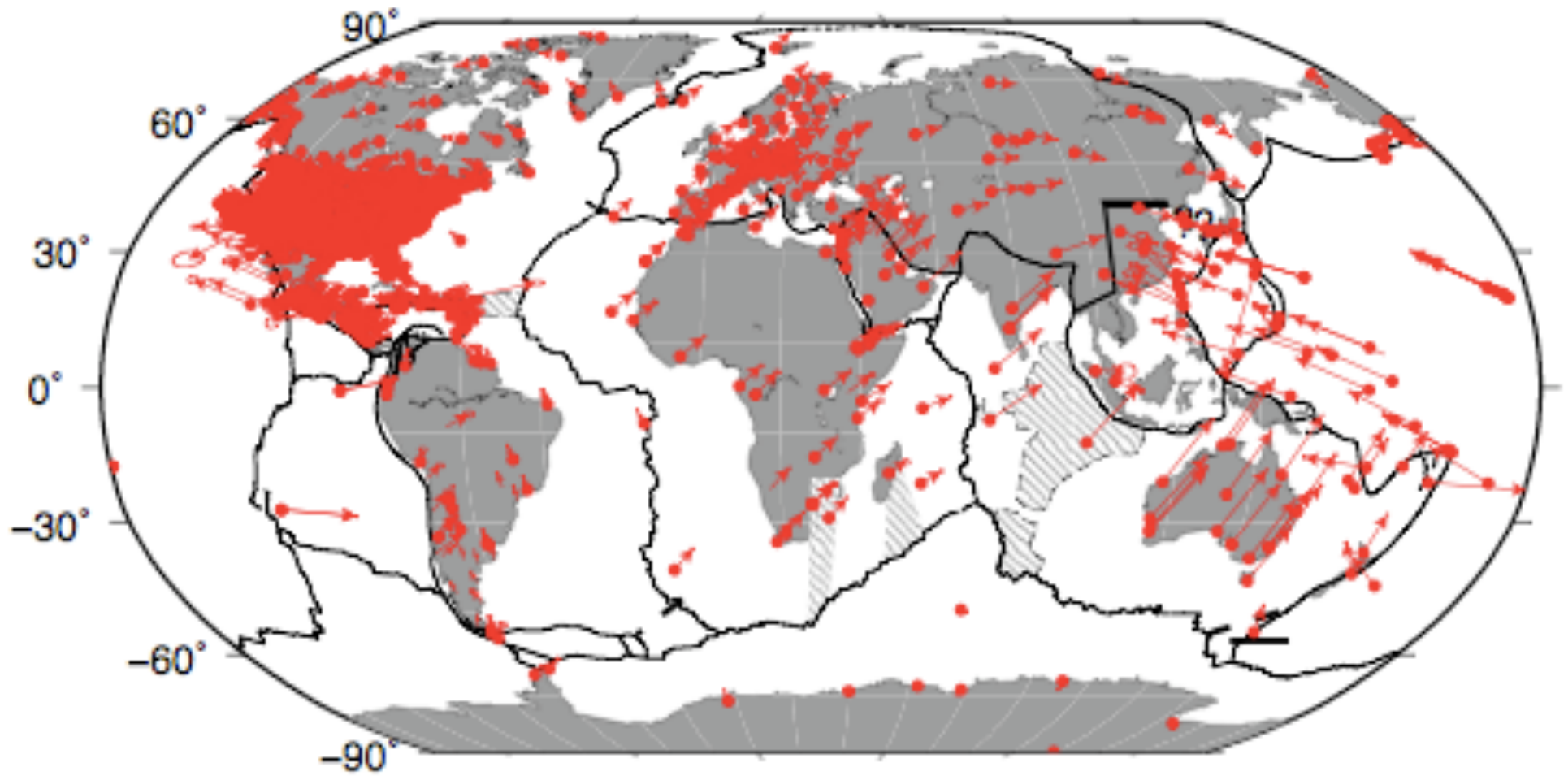
The basic principles behind GPS are really quite simple — even though the system itself employs some of the most “high-tech” equipment ever developed. To understand it, let’s break the system into five conceptual pieces and take those pieces one step at a time. We’ll start with the “big” ideas, and ignore some of the details. Then later, we’ll fill in all the fine points.



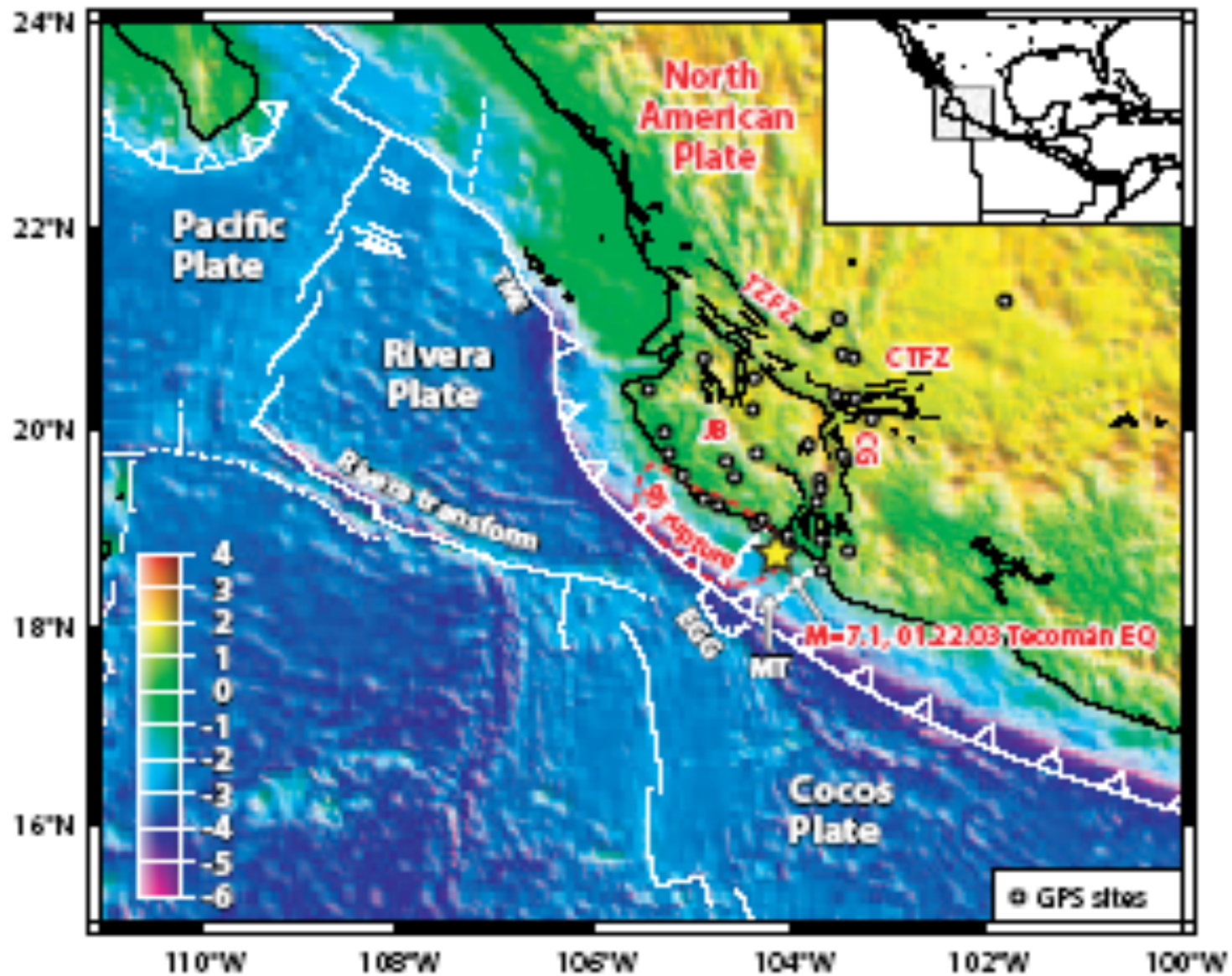


GPS station movements - North American plate

Global pattern of annual GPS site movements



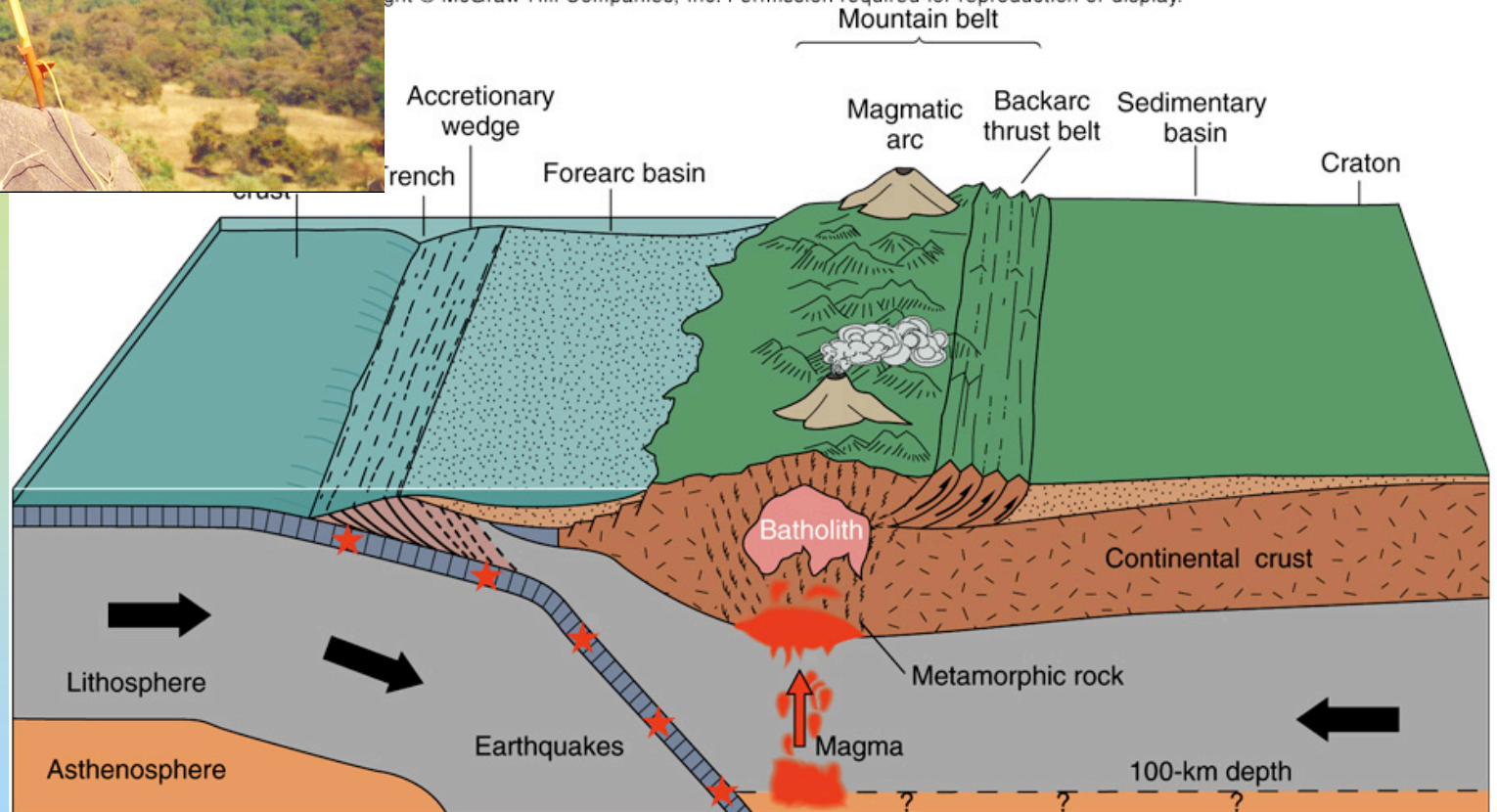
Colima-Jalisco Oct. 9, 1995 $M=8.0$ earthquake



Why do volcanos form above subducting slabs ?



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**Volcan Fuego (Fire)
of Colima – western
Mexico**



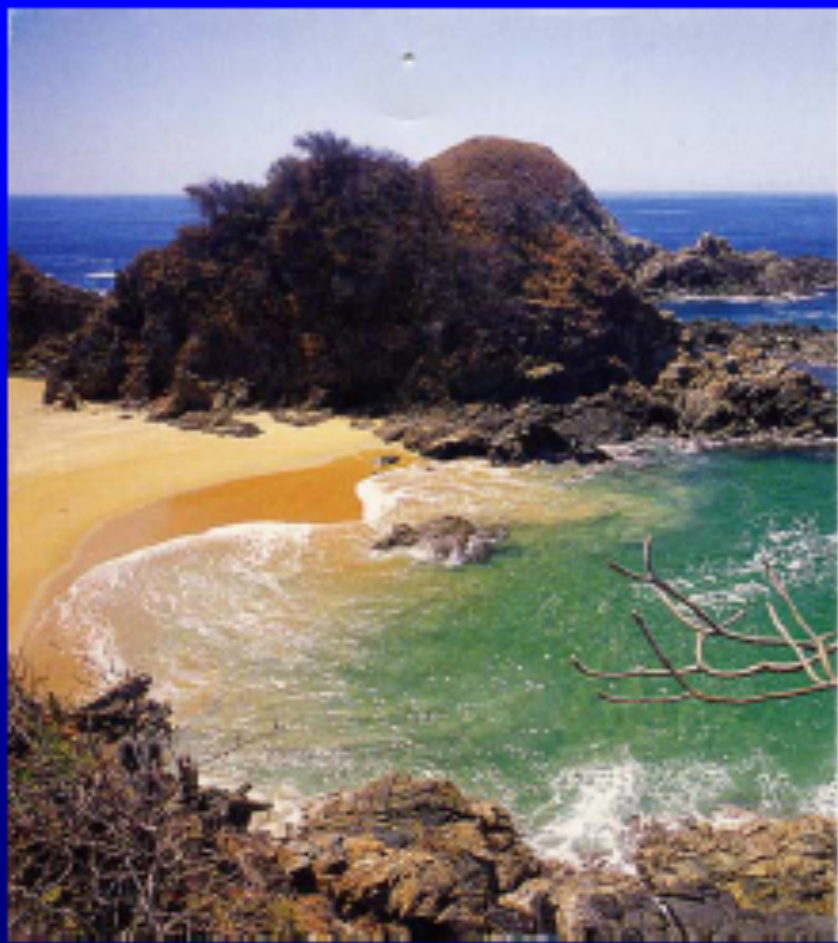
GPS sites in southern Mexico

left – Rancho Lu

right – middle school in mountains of Oaxaca

GPS





*Playa del Amor – Oaxaca
field area (left)*

*The road to GPS site AVAL
in rural Jalisco (below)*



**Earthquake! On Jan. 22
2003, a M=7.6 EQ happened
during our experiment.**



- Boulder slide
- Equipment knocked over
- Buildings collapse and 30 people died-





**El
Salvador –
land of
volcanos**





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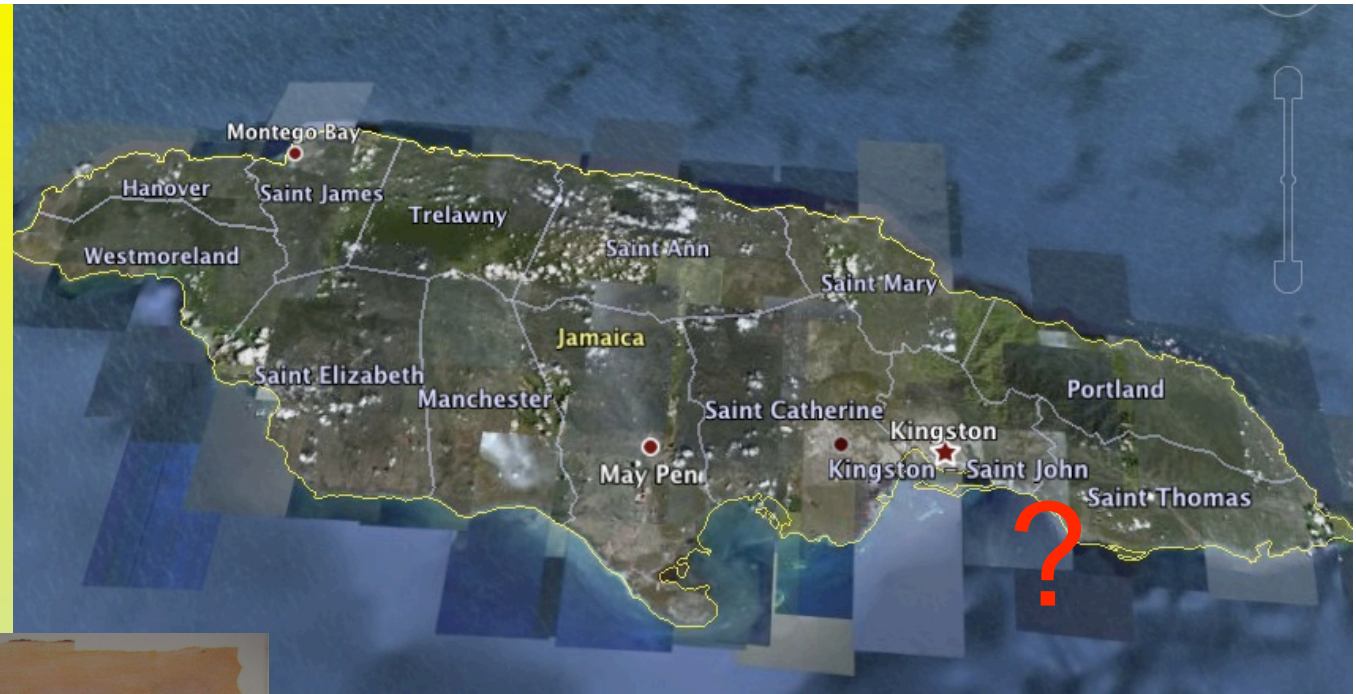
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
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© 2009 DMapas

©2009 Google

31°22'40.46" N 94°22'10.69" W elev 172 ft

Eye alt 5249.79 mi

Seeking the source of the 1692 earthquake, Jamaica



THE EARTHQUAKE (JUNE 7TH, 1692)

It was about 11:42 a.m. and the citizens of Port Royal were preparing themselves for their mid-day recess. Then came a roar from the hills that would destroy their world as they knew it. In just two minutes, three shock waves tore open the ground and the sea swept in to consume two thirds of the city.

The earthquake claimed the lives of 2,000 people. A further 3,000 souls later succumbed to their injuries, pestilences and vandals. Spectacularly, a Frenchman, Lewis Galdy, who worked in the slave trade, was swallowed up by the earth, but was subsequently spewed up.

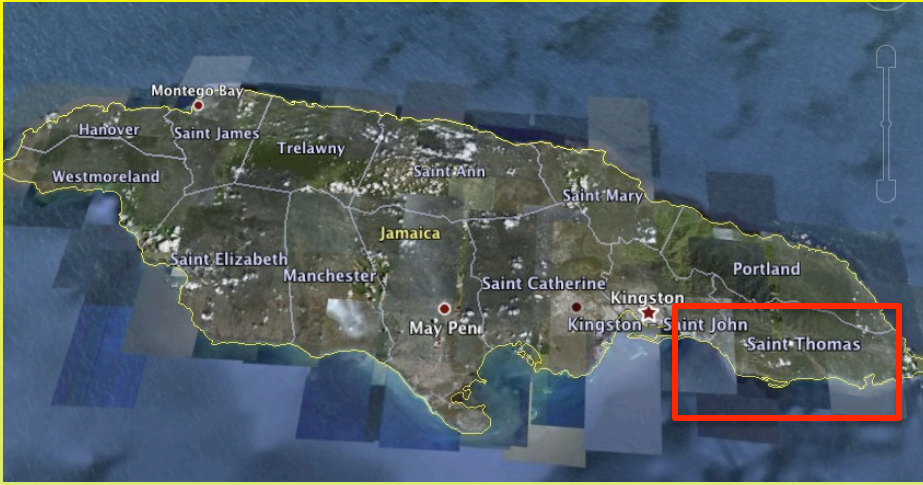
Though not abandoned, the earthquake resulted in migration to the mainland, initially to Rock Fort and then to the opposite side of the harbour, where Kingston emerged as Jamaica's main commercial city and capital.





**Preparing for field
work with Dr.
Margaret
Grandison, a
Jamaican
seismologist**





Seeking the earthquake fault in the jungles of eastern Jamaica





Time to eat !



Ocean cliff erosion
exposes interesting
rocks



Trenching to find faults in central Jamaica

