



Print Page

Cotati was once on the ocean floor

By Rolfe Erickson
Monday, February 4, 2008 10:54 AM CST

We shall go from the largest scale to the smallest in this discussion. To begin with, the crust of the Earth is composed of 14 large irregular fault-bounded plates, which move independently and slowly (an inch or two a year) and whose interaction governs most of what happens on our planet. Canada and the United States largely compose the North American plate, and the Pacific Ocean floor composes the Pacific plate. California lies at the western edge of the North American plate where it interacts with the Pacific plate.

About 200 million years ago the present location of Cotati was a thousand miles west of the North American plate, about two miles down on the floor of the ocean. The North American plate moved west to where it is now over this 200 million years and continues to move that way. The Pacific plate, in contrast, moves southeast toward North America and dives under it (subducts).

Oceanic sediments from this plate scrape off against the leading edge of the westerly moving North American plate and adhere to it, building the continent westward (offscraping). About 200 miles of western North America, essentially all of California, have been built this way in the last 200 million years.

The rock unit which underlies the Coast Range in this area, built of this offscraped material, is called the Franciscan Complex. As this material was scraped off deeper material melted, forming magma which erupted along the eastern edge of the state, forming the Sierra Nevada mountains (a magmatic arc). Between them lies an inactive basin, the Central Valley. The Coast Range, here at Cotati, was the site of constant erosion from about 200-300 million years. We were high and dry!

Thirty million years ago the San Andreas fault formed along the plate contact. The Pacific plate now moves northwest along it a few inches a year, periodically generating earthquakes of varied intensities. The earthquakes are just part of the natural scene, like clouds in the sky. The fault is gradually getting longer at both ends and one day will run from the Aleutians to the tip of South America. In Sonoma County we also have the Rodgers Creek fault, running southeast from Santa Rosa, which is driven by the same system.

The eroded Franciscan Complex has been shallowly submerged in the Cotati area over the last few million years, and covered with a thin sandstone called the Wilson Grove formation. Most of the best agricultural soils in Sonoma County are on this well-drained unit, which has been uplifted above sea level in the last few thousand years.

At the same time, a magmatic center not related to subduction has moved north through the Bay area, beginning at San Luis Obispo about 30 million years ago; it presently sits under Clear Lake, where it feeds active volcanoes. It is only an accident of history that there is not an active volcano there at the moment - the most recent cinder cone is only a few thousand years old! In Sonoma County as this center passed by 4-10 million years ago, it generated the volcanic units called the Sonoma Volcanics, which form a broad highland belt in the eastern county. These rocks are a mixture of hard lavas and lithified ash (tuff). The Sonoma Volcanics are being eroded and broken up by faulting along the Rodgers Creek fault and no primary volcanic topography from their heyday still exists.

The Cotati area at present sits in a fault-bounded depression full of lake sediments, which intertongue on the east with alluvial fans building down from the volcanic mountains. Periodic floods will affect the area, as will earthquakes. A wise citizen will take precautions for both events!

Earthquake information

Information on a recent earthquake can be obtained from a recording at the US Geological Survey at 1-650-329-4085.

For longer -range planning, earthquake maps and information go to <http://www.abag.ca.gov/bayarea/eqmaps>

For what to put in an emergency kit try these:

1. Disaster Survival Solutions @ www.QRCenter.com - they sell complete kits.
2. Local government info on Emergency Services: <http://ci.santa-rosa.ca.us/departments/adminservices/emergencyprep/Pages/default.aspx>
3. Big government info: Office of Emergency Services and Homeland Security has a 31-page booklet titled "Putting Down Roots in Earthquake Country." Log onto www.sfgov.org/oes or call (415) 558-2700.
4. And if you own your own home, consider earthquake insurance. Our home is our biggest investment for most of us. See your insurance agent.

Dr. Rolfe Erickson is a retired professor of Geology from Sonoma State University. He is presently researching possible local meteorite falls and unusual metamorphic rock units around the town of Cazadero.

[component:image-photo-html]
[component:image-cutline]

