

Phenomenon:

Earthquakes of Santa Barbara County

Guiding Question:

When and where will the next big earthquake (>5M) hit in Santa Barbara County?

[YouTube Link](#)

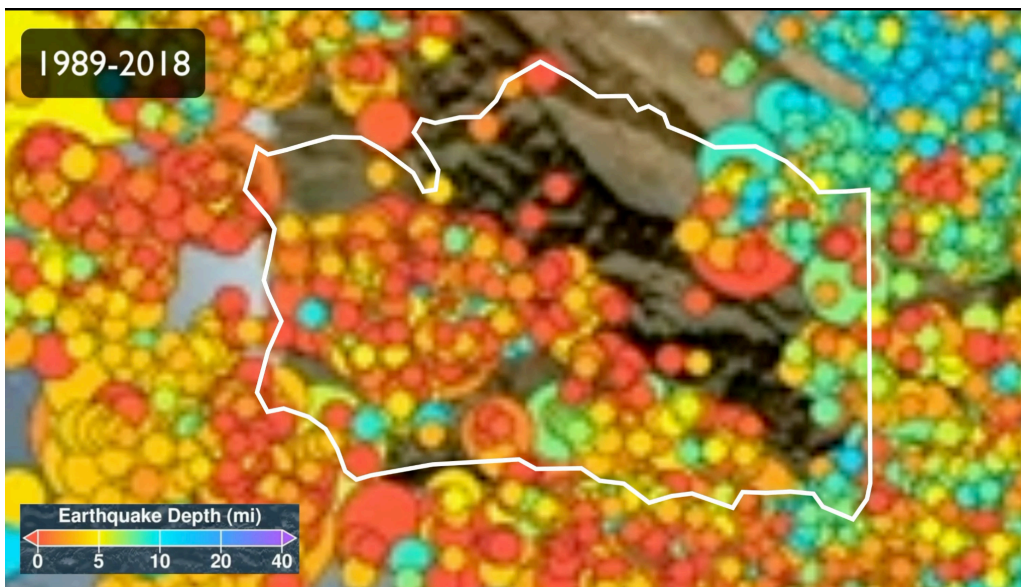


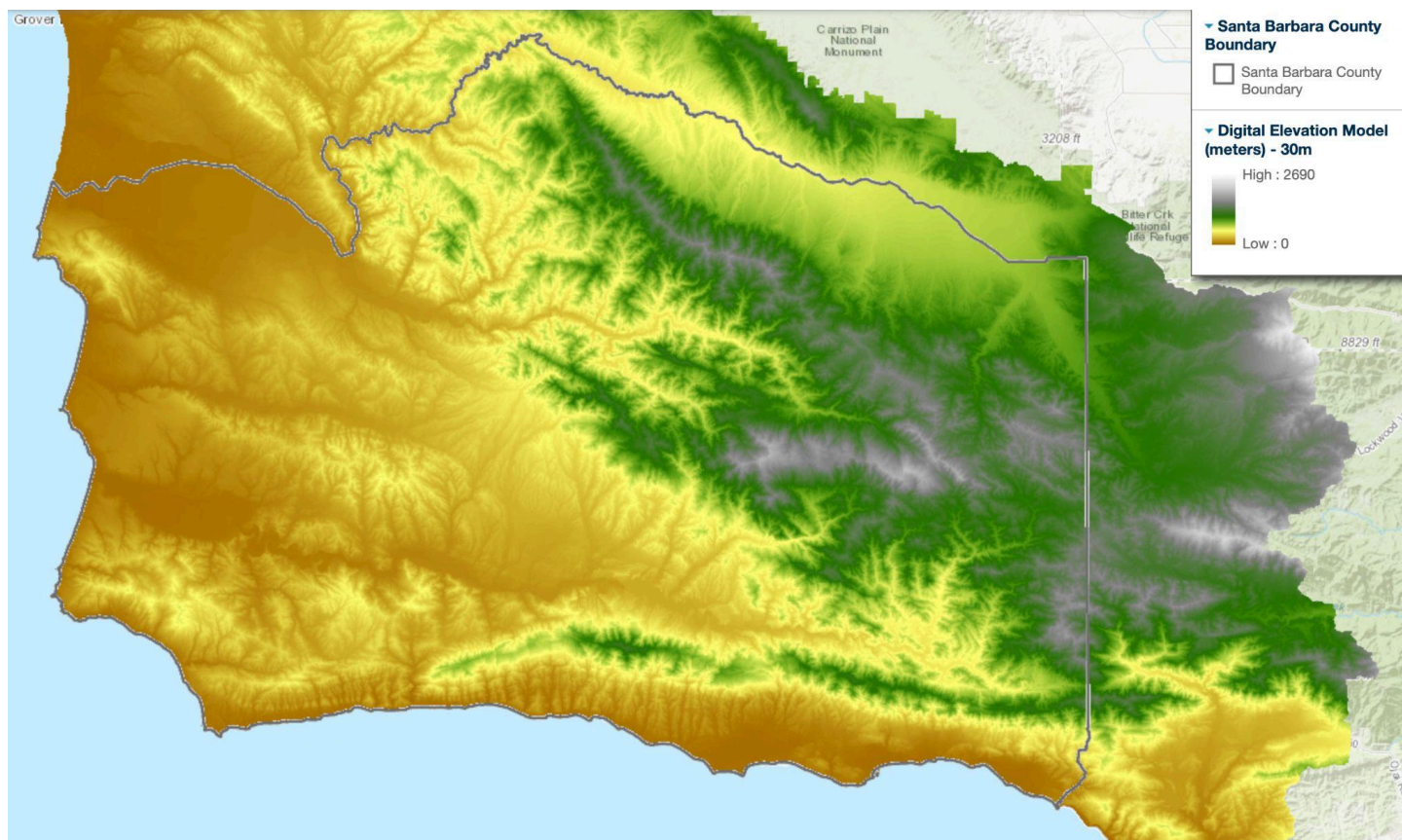
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1 - Santa Barbara County Map

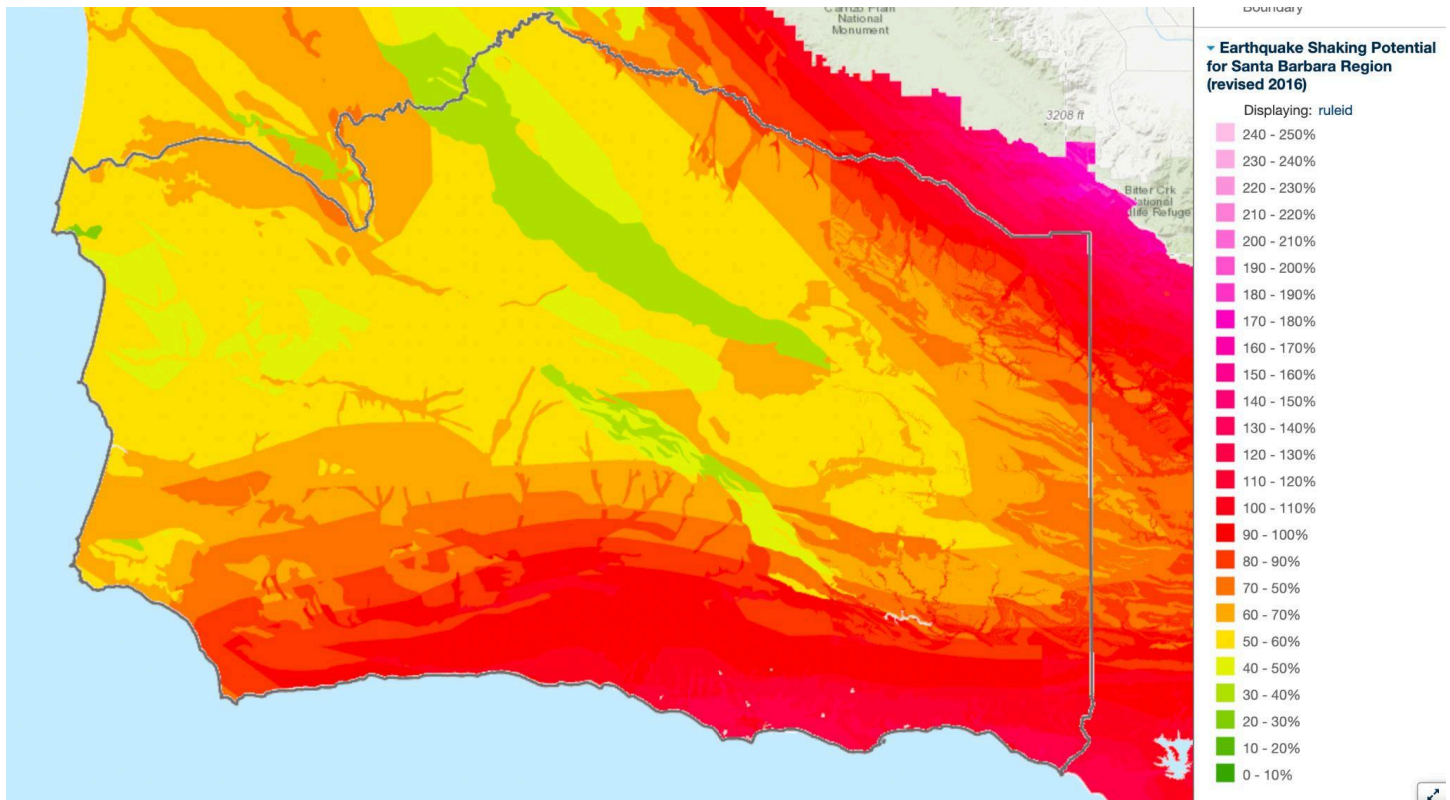


2 - Elevation of Santa Barbara County



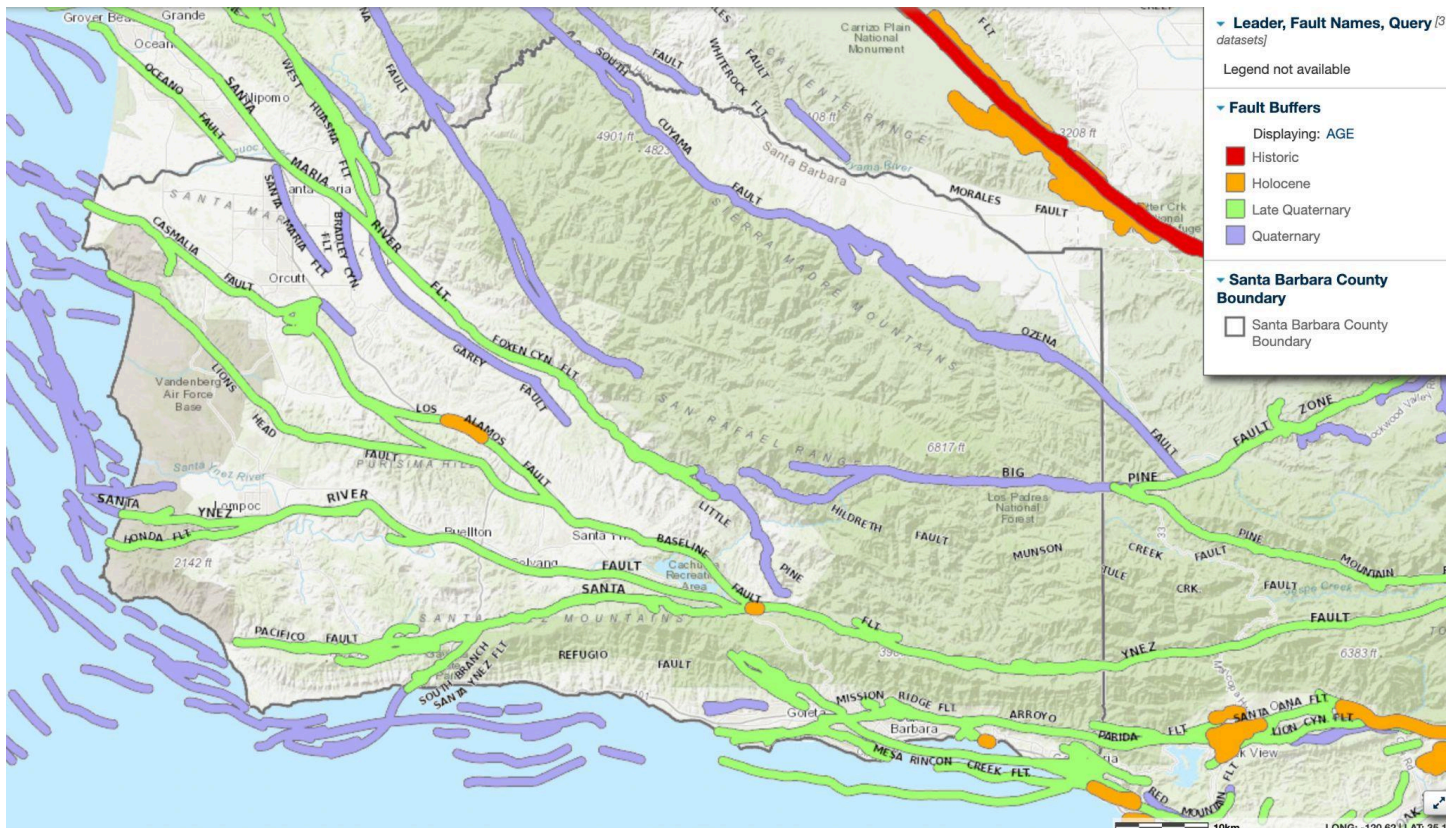
3 - Earthquake Shaking Potential - Santa Barbara County

These maps show the expected ground motions with a 2% chance of happening in 50 years at a frequency of 1 hertz. The Earthquake Shaking Potential Maps for California also take into account the amplification of ground motions caused by local soil conditions.



4 - Fault Activity - Santa Barbara County

The map indicates where known faults are located. It also shows the most recent time that the faults experienced movement, based on available information. This movement may have been caused by either earthquakes or a gradual shift along the fault. The faults are categorized into five time groups:



Historic faults: documented earthquake events since the 1700s.

Holocene faults: movement within the past 11,700 years.

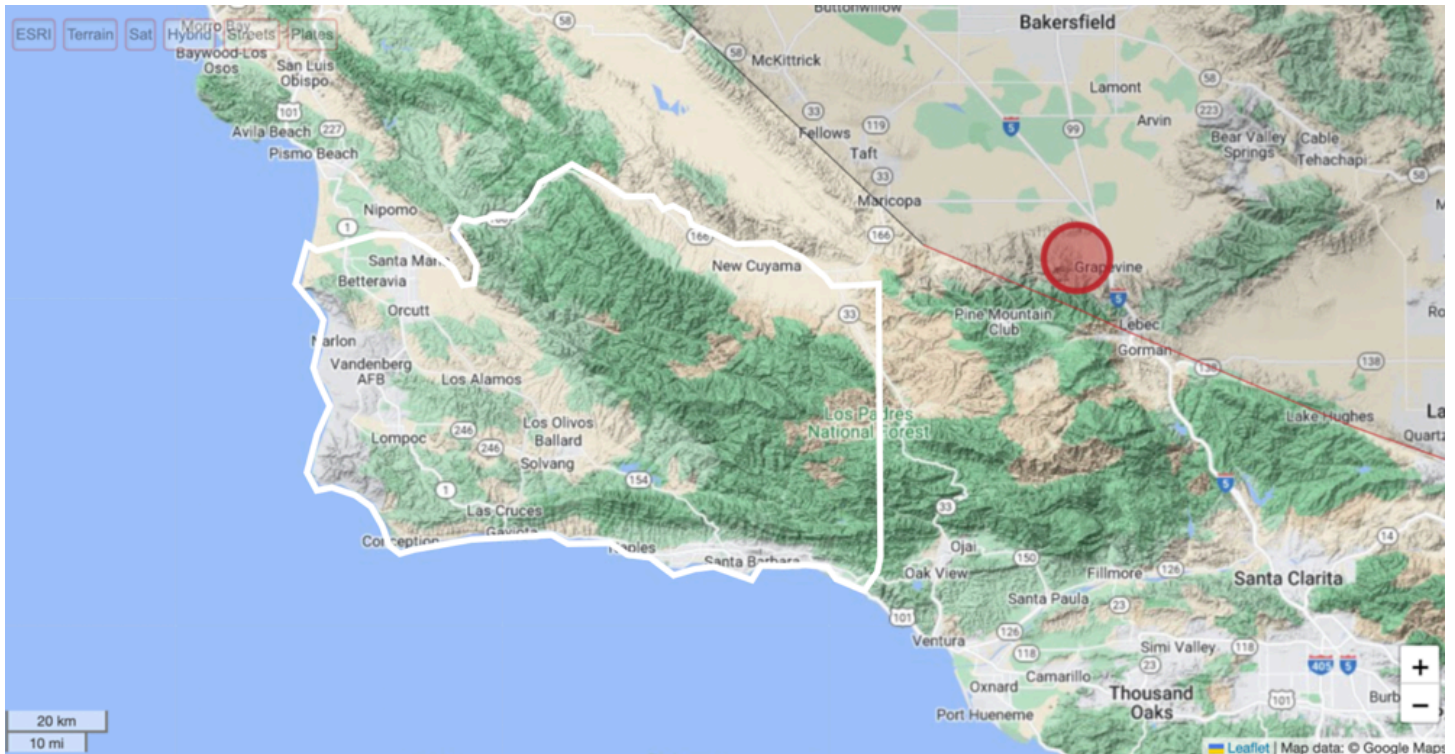
Late Quaternary faults: movement within the past 130,000 years.

Quaternary faults: movement within the past 2.6 million years.

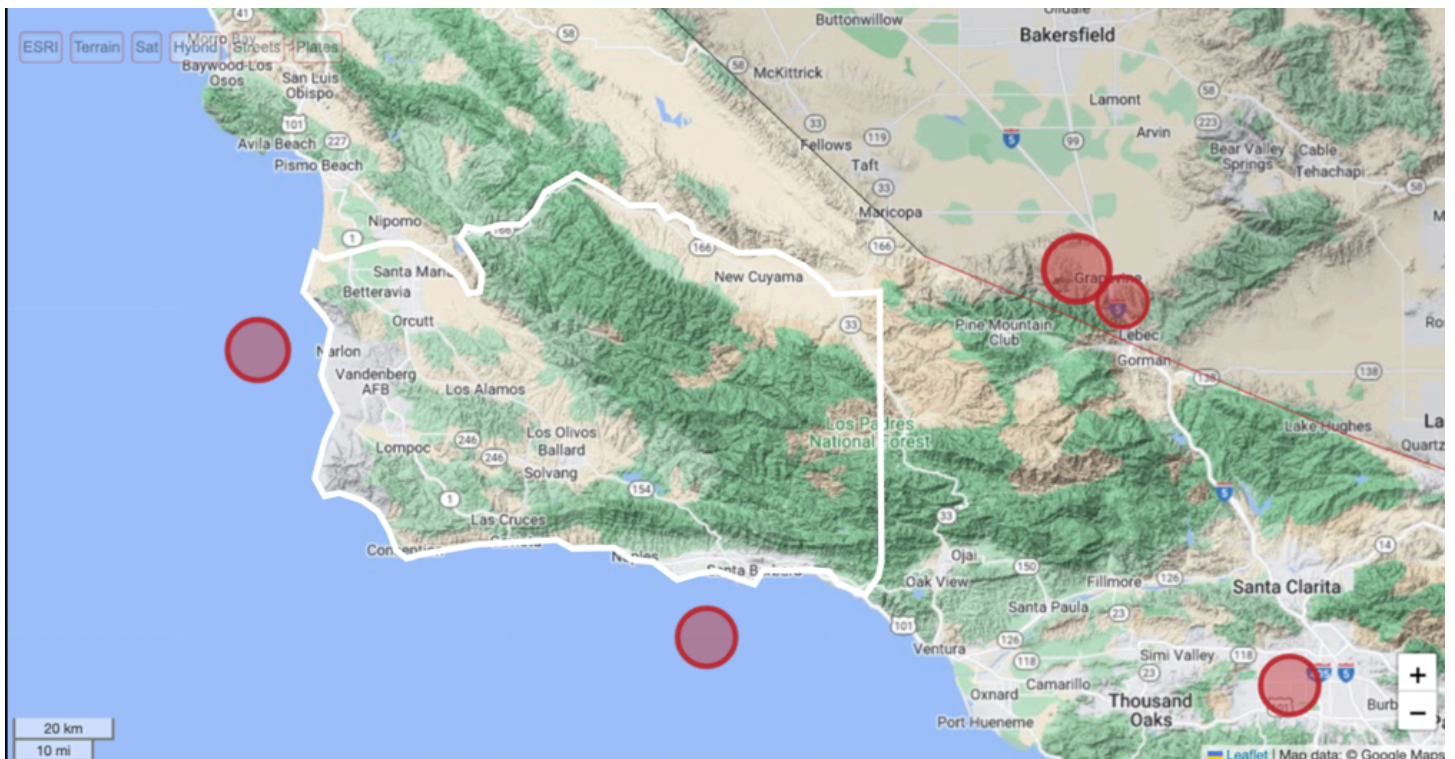
Pre-Quaternary faults: inactive for more than 2.6 million years.

5 - Location of Large Earthquakes Since 1900

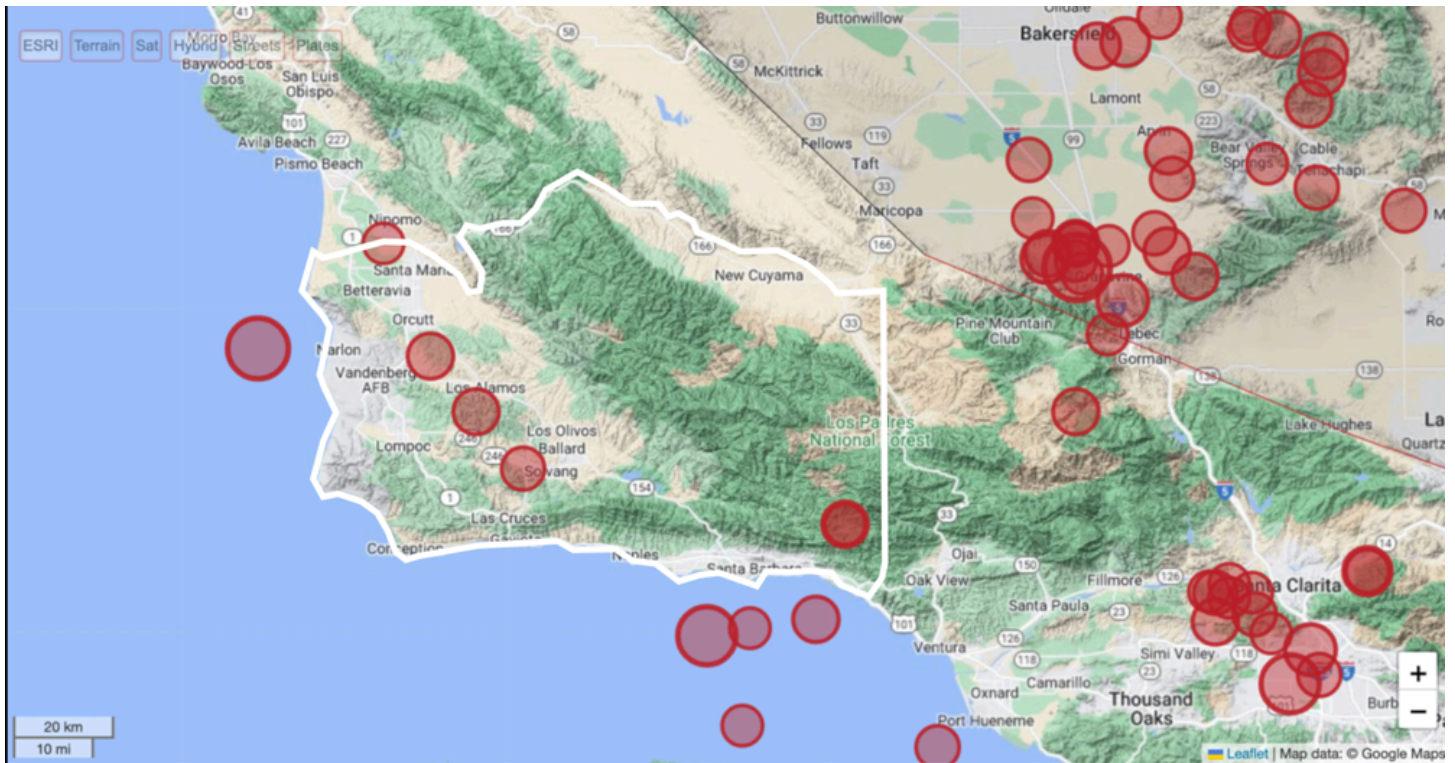
7.0 Magnitude and Greater



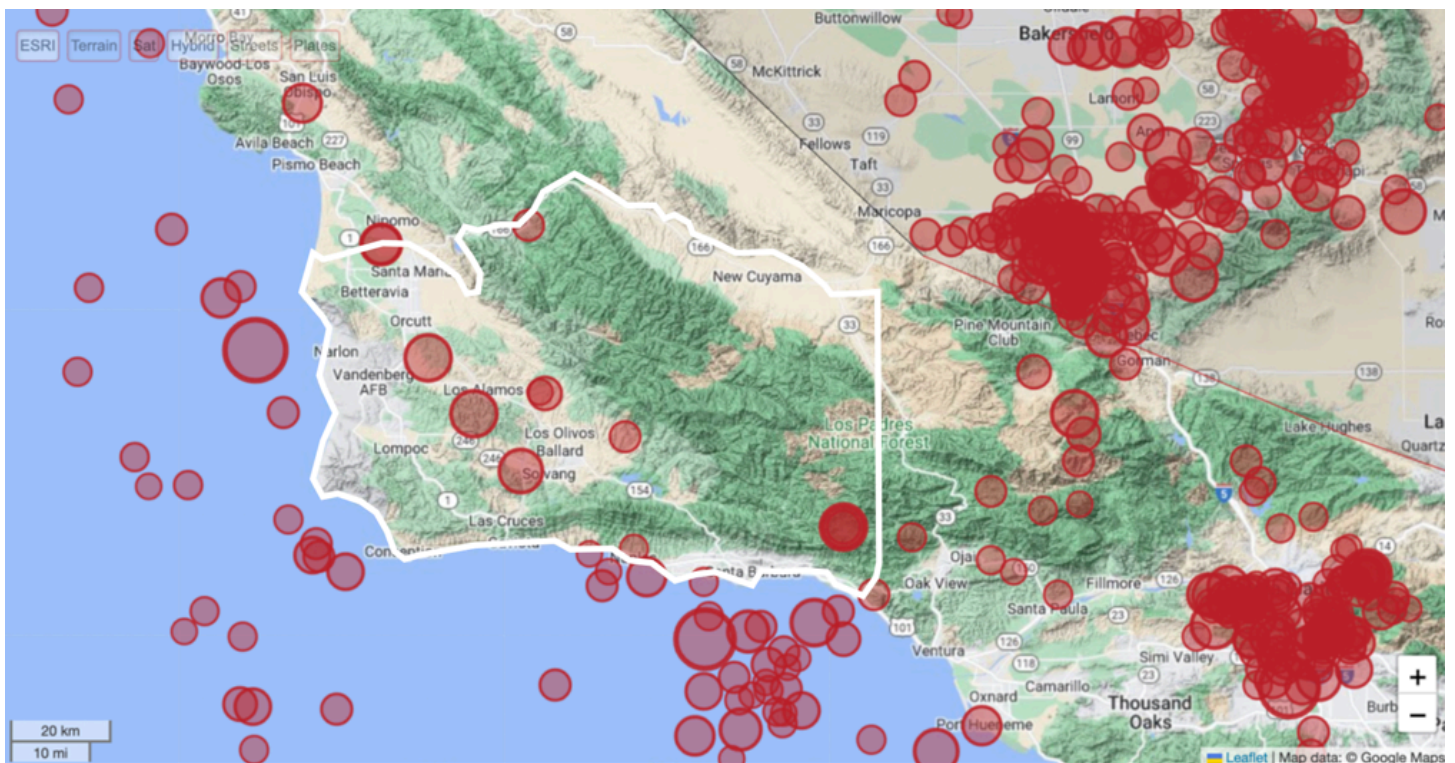
6.0 Magnitude and Greater



5.0 Magnitude and Greater



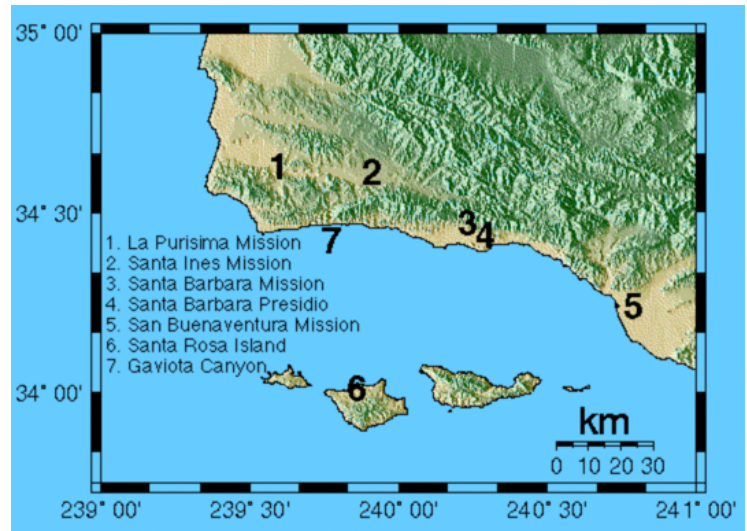
4.0 Magnitude and Greater



6 - Historic Earthquakes of Santa Barbara

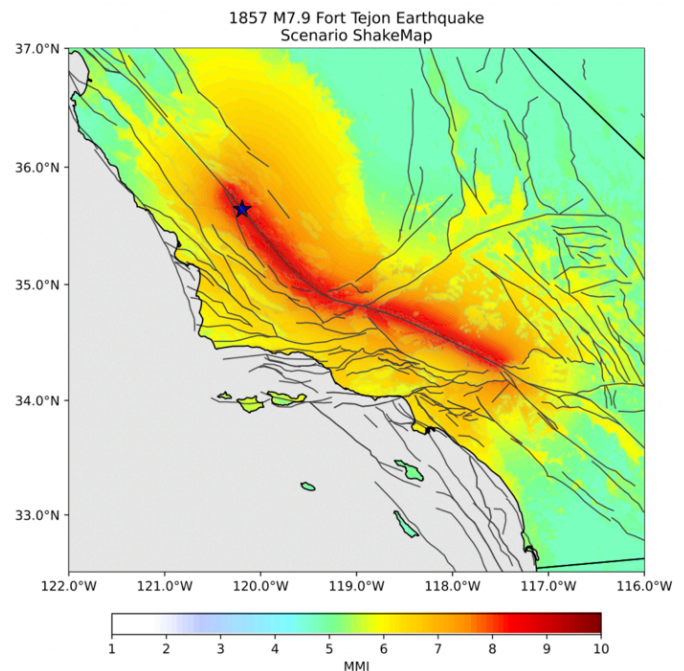
1812 - Santa Barbara Earthquake

In 1812, an earthquake hit Mission La Purisima in Lompoc Valley, causing the residents to evacuate the buildings. The initial shock was a foreshock, and the stronger earthquake that followed reduced the mission to rubble and ruin, causing significant damage to other missions and buildings over 100 miles away, including Mission Santa Ines, Santa Barbara Presidio, and Mission San Buenaventura.



1857 - Fort Tejon Earthquake

The 1857 earthquake in California was larger than the famous 1906 San Francisco earthquake, causing significant damage despite only two fatalities due to the small population at the time. The earthquake occurred along the San Andreas fault, had a magnitude of 7.9, and an estimated recurrence interval of 140 years \pm 40 years.



1902 - Los Alamos Earthquakes

The August 1902 earthquakes in Los Alamos, Santa Barbara County, were initially sensationalized by the media, with reports of buildings collapsing, churches being leveled, and the town being deserted. However, the Chronicle later admitted that the reports were exaggerated and that the damage was much less severe than originally reported. Despite this, around 75 separate shocks were counted, and approximately 60 people from the town were evacuated.



Los Alamos circa 1900

1925 - Santa Barbara Earthquake

In June 1925, Santa Barbara experienced an earthquake that woke up residents in the early hours of the morning, causing damage to commercial buildings, including hotels and the Sheffield Dam. Thirteen people were killed, and the earthquake ultimately proved beneficial to the city, as it provided an opportunity to enforce stricter building code and require commercial buildings to adopt a Spanish-Moorish style of architecture. This distinctive architecture has made Santa Barbara a popular tourist destination for over 70 years.



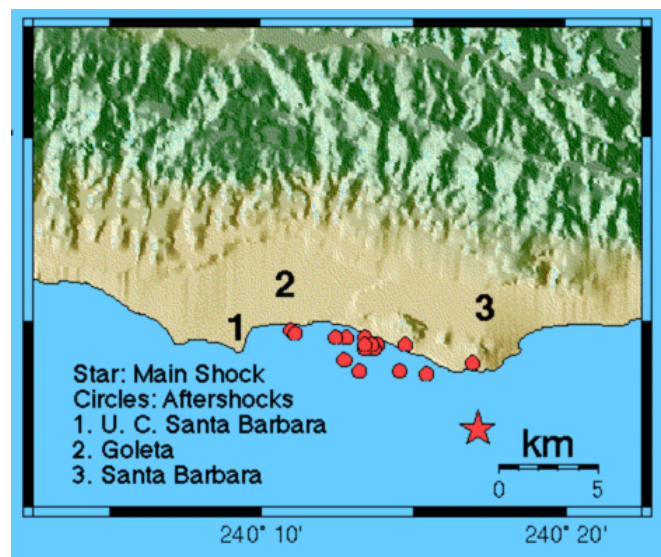
1927 - Lompoc Earthquake

In November 1927, an earthquake struck underneath the Pacific Ocean, causing a small tsunami and dead fish to float on the ocean's surface. The earthquake was preceded by several smaller ones, with the largest occurring at 5:51 AM and causing damage to buildings, highways, and bridges, particularly in western Santa Barbara County. The earthquake also affected towns inland, including Lompoc, Santa Maria, and Los Alamos, where people were awakened and experienced collapsed chimneys, cracked windows, and falling goods.



1978 - Goleta Earthquake

In 1978, a swarm of small earthquakes occurred underneath the Santa Barbara Channel, followed by an earthquake on August 13 that ruptured to the northwest and caused significant damage in Goleta, including shattered windows, store goods thrown to the ground, and mobile homes thrown from their supports. The earthquake was recorded 0.45 to 0.94 times the acceleration of gravity, and the UCSB library lost one-third of its books, while a landslide blocked San Marcos Pass, and a freight train derailed ten minutes after the earthquake.



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