

How would a megathrust earthquake on the Cascadia Subduction Zone affect the San Francisco Bay Area?

Shaking

The distance from the southern end of the Cascadia Subduction Zone (CSZ) to San Francisco is about 340 km (211 mi) and so the shaking will probably be no more than moderate, generally. However, in certain areas where natural or artificial infilling of sediments has occurred, shaking can reverberate and amplify. The USGS provides estimated shakemaps for two CSZ scenarios. The first is an M9.0 megaquake and the second, an M9.3:

https://earthquake.usgs.gov/scenarios/eventpage/gllegacycasc9p0expanded_se#executive
https://earthquake.usgs.gov/scenarios/eventpage/bssc2014cascadia_sub0_m9p34_se#executive

Clearly, the worst case for the Bay Area is the *Cascadia M9.3 Scenario*, where the Bay Area would experience (1) light to moderate shaking, and (2) none to very light damage. Again, particular places with sedimentary infill will experience stronger shaking and liquefaction may take place.

Although the shaking that the Bay Area experiences will probably be moderate, it will be broad in extent, and because several faults in the area are presently quite strained, there is a chance that the wave energy may trigger a local quake.

Tsunami

A megathrust Cascadia earthquake will generate a tsunami—as they have multiple times in the past. The link below provides a computer simulation that estimates the wave action. At about 2:00 and afterward in the video, are several clips showing the wave on the coastline near San Francisco and illustrations of what can happen near drainage entries, river channels, and flood plains. One reasonable concern is that, although there will probably be about an hour to escape to higher ground in the Bay Area—when the public hears a warning siren, will everyone (including area visitors and vacationers) think *tsunami*?

https://www.youtube.com/watch?time_continue=35&v=GhdcajbMVMl



Source: 123RF