

## Major quake on Hayward fault more likely, scientists say

Link to South Bay's Calaveras fault adds trouble

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The Hayward fault, long dubbed a "tectonic time bomb," soon may have a more ominous moniker: "The most dangerous urban fault in America."

Earthquake experts revealed at a major science conference in San Francisco today new disturbing information about the fault line that dissects heavily populated parts of Fremont, Hayward, Oakland and Berkeley, saying in a nutshell that it's bigger, badder and more worrisome than ever.

Not only is the fault longer - and therefore capable of causing a bigger quake - than thought just a few years ago, there is now strong evidence that it's connected to the nearby Calaveras fault, raising concerns both faults could go off at the same time. That's especially troubling news for the South Bay, because the Calaveras - responsible for October's 5.4-magnitude quake near Alum

Rock - extends from just east of Gilroy through the east foothills to near Dublin and San Ramon.

As if this dangerous partnership wasn't enough - scientists say part of the Calaveras fault should probably be renamed the Hayward - a new computer model suggests the odds of a "Big One" rocking the Hayward are greater than 50-50 within the next few decades. The previous estimate was 27 percent.

"This has important ramifications for all of us who live in the Santa Clara Valley and San Jose," said Dave Ponce, a physicist with the USGS in Menlo Park.

Under new, worst-case scenarios, "we're talking about twice as big an earthquake as the Loma Prieta - or even four times as big," said Russ Graymer, a USGS geologist.

Scientists used to believe the Hayward fault approached the Calaveras, but ended up about a mile short of connecting. Now, after taking advantage of advances in technology to more accurately pinpoint the epicenters of small earthquakes in the South and East Bay, researchers have determined the two faults actually connect just northeast of San Jose, about four miles below the Earth's surface.

"One of our inside jokes is the central Calaveras fault is misnamed," Ponce said. "We'd just as soon it be called the southern Hayward fault."

By having more accurate knowledge of where the Bay Area's quakes have occurred, scientists plotted the points on maps and determined the Hayward fault actually extends about 6 miles farther from where they thought it ended. The power of an earthquake correlates with the length of a fault's rupture, so bigger faults mean bigger quakes.

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But when considering the Hayward fault's cozy connection with the Calaveras, experts say, it's likely an additional 25 miles of fault line could rupture under ideal circumstances, making for a far bigger earthquake than the Bay Area has seen since the likes of the 1906 Great San Francisco tragedy.

"Instead of having separate earthquakes on these faults, they could team up to have one big earthquake," Graymer said. With a potential magnitude of 7.2 or even 7.4, "we're talking about twice as big as the Loma Prieta earthquake - or even four times as big."

The concern is that a quake could originate on the Hayward fault in San Pablo Bay, just north of Richmond, travel south and just keep going once it hits the Calaveras near San Jose. But also troubling is the potential for a quake to start on the southern portion of the Calaveras fault and head north, rattling the Hayward.

"This highlights the hazards of *both* the Hayward and the Calaveras," said Tom Brocher, coordinator of the USGS' Northern California earthquake hazards investigations.

In 2003, researchers concluded the Hayward fault was the most likely fault in the Bay Area to have a magnitude 6.7 or greater temblor by 2032. But Brocher said it's clear that's a gross underestimate, and that the USGS will probably raise that figure in the next few months.

As scientists also assess the nation's greatest seismic hazards, the Hayward keeps coming at the top of their list. Not only does it transverse densely populated areas, new research suggests it ruptures on average every 140 years, with the last big Hayward quake occurring 139 years and 2 months ago.

"Nationwide, there are other faults that have the potential for big earthquakes, but they are nowhere near as likely as a big earthquake on the Hayward fault," said Chris Wills, an engineering geologist with the California Geological Survey. "This is clearly the most hazardous."

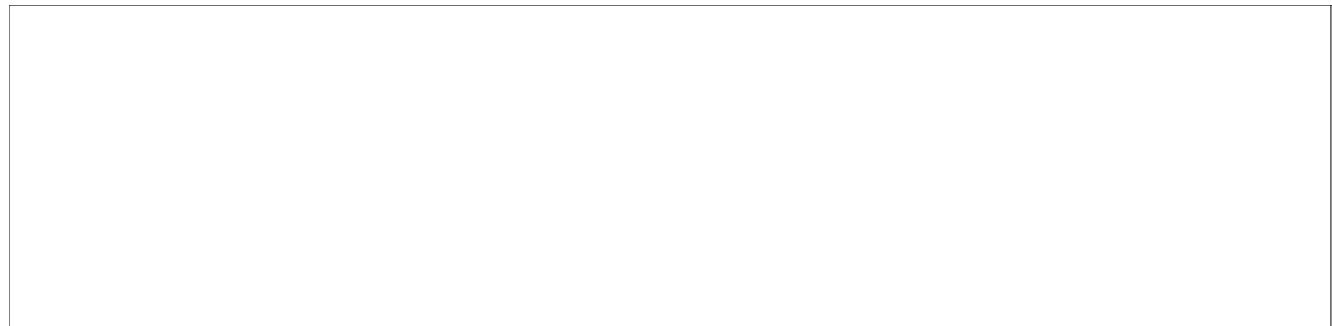
The marriage between the Hayward and Calaveras faults only heightens those concerns. Scientists can tell from trench studies that multiple segments of the Hayward fault have ruptured together in the past - but they can't tell exactly when. One current assumption is that if the Hayward fault has a major quake every 140 years, it's possible that the Hayward and Calaveras rupture together only once every 1,000 or 2,000 years.

While seismologists can't predict when the next Hayward fault quake will occur, they say they are confident it's not a matter of if but when. And Bay Area residents should be prepared, storing water and food, putting together an earthquake plan and considering whether to have their homes checked for seismic safety.

"The Hayward fault is ready," Brocher said. "Are you?"

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