EARTHQUAKES

Big quake more likely

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MENLO PARK — There is a 2-to-1 probability another major earthquake will rock the San Francisco Bay Area in the next 30 years, scientists said Thursday.

"We now believe it is more than twice as likely to occur as not occur," said Bill Ellsworth, a geophysicist with the U.S. Geological Survey and member of the California Working Group on Earthquake Probabilities.

The estimate is a significant increase over 1988 estimates when scientists said there was a 50-50 chance of a major earthquake, defined as magnitude 7 or greater.

The new estimate of a 67-percent probability of a major quake by the year 2020 must be considered a minimum estimate, Ellsworth said. "The probability is high enough to warrant an active program of mitigation," he said.

The new findings are the result of a six-month study begun last December. The USGS planned to announce the results next month when its report was printed, but officials hastily called a press conference Thursday after the San Jose Mercury News obtained an advance copy.

Ellsworth and others used the announcement to press for increased preparation by the public. "We can't control earthquakes but we can control or lessen the damage," geophysicist Peter Ward said.

Scientists view the Oct. 17 Loma Prieta earthquake "as a warning shot," Ward said. Rich Eisner, of the state Office of Emergency Services, said local governments need to act to strengthen unsafe buildings.

"Santa Cruz provided a good example if you don't do anything," he said.

The USGS is preparing a 24-page magazine outlining earthquake safety preparation, he said. The agency plans to print 2.5 million copies in English, Spanish and Chinese to be distributed at the end of August in newspapers between Monterey and Santa Rosa.

Ellsworth gave three reasons for the increased likelihood of a large quake:

- The addition of the Rodgers Creek Fault in Sonoma County to the list of slip-prone faults.
- Faster slip rates on the San Andreas and Hayward faults.
- The effects of the Santa Cruz Mountains Earthquake on other fault segments.

The new findings contain some good news for Santa Cruz County battered by the 7.1 magnitude Oct. 17 quake. The 25-mile segment of the San Andreas Fault that slipped deep under the Santa Cruz Mountains is the least likely to slip again, scientists said. There is less than a 1-percent probability for a repeat of the same quake in the next 30 years.

Local residents would feel the ef-

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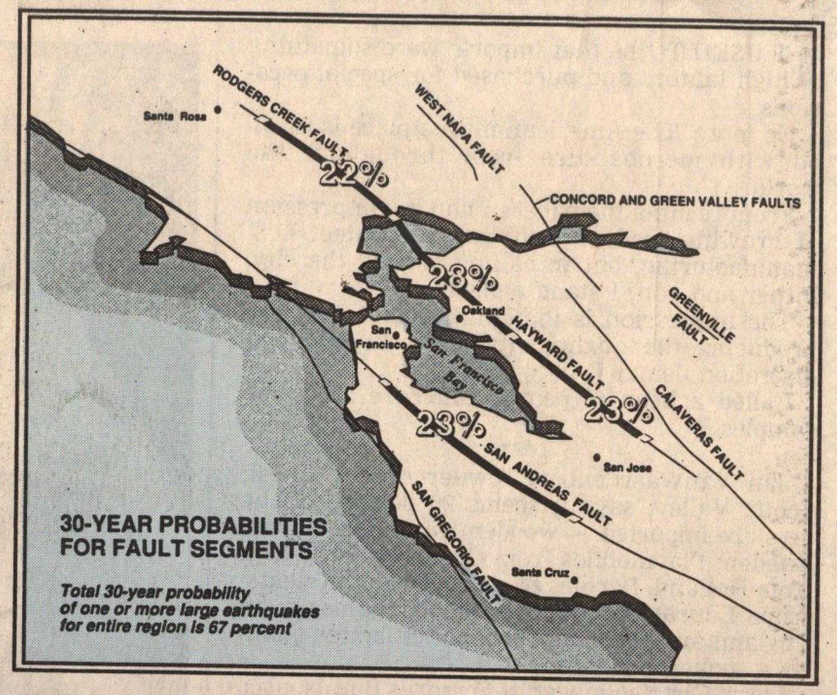

Quake odds

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fect of a major quake on any of the other fault segments, but the shaking would be less severe in Santa Cruz County than that felt Oct. 17.

The 67-percent probability rate means there is a 2-to-1 chance a quake will hit one of the four major faults in the greater Bay Area. Chances are in the 22- to 28-percent range that any one fault will be involved.

About one-half the increase in probability is from the inclusion of the Rodgers Creek Fault that runs from San Pablo Bay to Santa Rosa. Detailed studies over the past two years, including trenching last summer, lead scientists to conclude there is a greater chance there of a quake than previously thought.

The most likely areas to be hit in the next three decades are the northern or southern segments of the Hayward Fault in Alameda County. Three million people live in the areas most affected. Between 3,000 and 7,000 people would be killed in a 7 to 7.5 magnitude quake, based on 1980 estimates.

Ellsworth said scientists believe the San Francisco Bay Area is in an era of increased quakes similar to the 19th century. Seismic activity was much higher in the area in the 70 years before the 1906 San Francisco Earthquake than in the 50 years after.

Since 1957, quake activity has been similar to the period before 1906. In the 19th century, magnitude-6 earthquakes, similar to what struck Morgan Hill in 1984, hit every 10 years on average, Ellsworth said.

Historical records indicate that large quakes occurred in pairs. An 1836 magnitude-7 quake on the northern segment of the Hayward Fault was followed two years later by a similar-sized quake on the San Francisco peninsula.

In 1865, a 6.5-magnitude quake on the San Andreas Fault near Loma Prieta was followed three years later by a magnitude-7 quake on the southern segment of the Hayward Fault, Ellsworth said.

Scientists don't fully understand the connections. "Such pairing could be coincidence," Ellsworth said. There is no model that supports the connection, but scientists cannot dismiss the pattern, he said.

Ellsworth said it is unlikely there will be a repeat in the next 30 years of a "great earthquake" of 8 magnitude, like the 1906 San Francisco quake. The displacement during the 1906 quake was of such an extent — 4½ meters over a distance of 270 miles — that scientists conclude there hasn't been time to build up the same subterranean pressure.