

# Why state redrew quake hazard maps

**Corey G. Johnson, California Watch, 4-11-11**

In southern San Mateo County, two miles east of the Pacific Ocean, lies the blue-collar town of Pescadero, a tourist destination and geologic time bomb.

When resident Bryan Burns steps out his door, he sees Pescadero High School, and he's beset with worry. More landslides occur here than any other place in the state. Two dangerous earthquake faults, the San Andreas and San Gregorio, run through the area.

Burns has been hounding school leaders about the stability of the ground underneath the school, which opened at its current location in 1960, and about a county planning map showing a branch of the San Gregorio fault that has been ignored.

The case of Pescadero High neatly illustrates the breakdown of California's system regulating the seismic safety of its schools. Laws were overlooked and standards were lowered, yet the school continued to make significant building repairs without addressing potential seismic dangers.

Pescadero is just one school that found itself in a fault hazard zone one day - and gone the next. California Watch found other examples of schools removed from hazard zones, including ones in the seismically active areas of Los Angeles and Alameda counties.

This loosening of state standards came amid pressure from property owners, real estate agents and local government officials who feared property values throughout California would decline, according to interviews and documents.

California excluded scores of older, potentially active faults and narrowed the zones considered hazardous. Removing schools from the hazard zones was not the state's central intent - but several ended up outside the lines when the new maps were changed.

For parents, children and teachers living in areas prone to major earthquakes, the redrawn maps may provide a false sense of security.

For the town of Pescadero, the change was striking.

The old Franklin Point Quadrangle map from 1976 shows uninterrupted borders smoothly running north to south, outlining an earthquake danger zone. Pescadero High is firmly within that zone. On the newer map, created in 1982, the hazard zone takes a sharp right angle - neatly carving out a supposedly secure zone around the school.

"Faults don't go at right angles," said Peter Yanev, a World Bank earthquake engineer with 40 years of experience, who reviewed the maps for California Watch. "It doesn't look right because faults don't do this."

The California Geological Survey has drawn 708 separate maps with one or more earthquake hazard zones on each. The maps are required by the 1972 Alquist-Priolo Earthquake Fault Zoning Act, passed one year after the Sylmar quake in the San Fernando Valley killed more than 60 people and caused more than \$500 million in damage.

The law is considered important because it offers critical protection for people living in areas where earthquakes can break through the ground and upend buildings. Real estate agents are required to notify potential buyers about any fault zones on the property, a burden they have complained is too costly and unnecessarily scares people.

More importantly, the Alquist-Priolo law requires school districts to hire geologists to make a detailed assessment of nearby earthquake faults before renovating or building in these zones. Builders, teachers, children and parents are left in the dark without those assessments.

Still, several school districts in these hazard zones have started and completed building projects in recent years without investigating fault-line hazards, records and interviews show.

Pescadero High, with fewer than 100 students, has several buildings on its campus that never have been certified as safe under the Field Act, the seismic building standards law for public schools enacted after the 1933 Long Beach earthquake.

As soon as the state geologist's office released its hazard-zone maps in early 1974, groups with financial interests in property and economic development began to complain, according to records and interviews with earthquake experts working at the time.

Real estate agents saw the maps as a threat to property values. City and county officials accused the state of engaging in a massive government takeover.

"Realtors absolutely hated it," said Earl W. Hart, manager of the Alquist-Priolo program from its inception until the mid-1990s.

In one three-week period in October 1974, Hart reported receiving 52 complaints from real estate agents, developers, property owners and others. During the commotion, the state geologist at the time, James E. Slosson, refused to "water down" the hazard zone maps, notes from the State Mining & Geology Board show.

But in late 1975, Slosson resigned and was replaced by Thomas E. Gay Jr., who began re-examining the fault zone maps. By February 1976, the Fault Evaluation Program was born.

Hart's team no longer included faults without significant ground movement in the past 11,000 years. Previously, the state had used the scientific standard of 2 million years - criteria still used by other states - to draw the zones.

Seismic experts say it's difficult to predict when any fault, regardless of its age, will rupture again. And faults are hard to identify in urban and wooded areas without conducting field investigations. But Hart's team did not perform any field investigations to locate faults because the Legislature had not allocated money for the job, records and interviews show.

The method of changing the maps has prompted concern from some geologists.

"I'm not sure I'd call it science, but it's a technique that's used," said Gerald E. Weber, a private geologist who worked on the original Alquist-Priolo fault map covering the Pescadero area. "They have a system. I'm not sure I agree with it. And they may be underestimating the potential for some of these to have earthquakes."

As a result of the changes, many fault zones shrank or disappeared from the Alquist-Priolo maps.

In the San Francisco Bay Area, 13 maps had fault zones that were removed, according to an internal state geologist report. Out of 708 maps released over the past three decades, the state geologist's office has redrawn 161.

State Geologist John Parrish said the current maps are based on standards mandated by the State Mining & Geology Board, whose nine members are appointed by the governor and include a mixture of scientific experts. His office follows those standards. Strengthening them, he said, is a "social-political question" that he cannot control.

The state geologist and the staff at the California Geological Survey advise the board, which has final authority over the maps.

"We have to map according to the criteria laid down for us," said Parrish, former executive officer of the State Mining & Geology Board. "It's up to the board to define what is an active fault. We take our policy decisions from those definitions. We cannot map faults outside that criteria."

The state geologist's office has been preparing 15 new hazard zone maps, but the work has slowed because of budget cuts.

As for Pescadero High, Parrish said he would welcome evidence from the town or school district showing a potentially dangerous fault, and if he's convinced, he would redraw the Alquist-Priolo hazard zone to include the area.

Pescadero resident Burns said the situation is urgent.

"If the statistics are correct and the San Gregorio is as dangerous as the state says, somebody is going to get injured or killed over there," said Burns, whose family sold the land where the high school was built.