**Earth Science Literacy Fusion Activity: “Locked Faults Could Pop Big Earthquake in Bay Area: Study”**

Several faults underlying urban areas in the San Francisco Bay Area may be primed for a major rupture that could lead to a magnitude 6.7 or larger earthquake, new data suggest. Sections of the Hayward, Rodgers Creek and Green Valley faults are nearing or past their average earthquake recurrence intervals, according to the study published in the Bulletin of the Seismological Society of America. The faults appear to be locked, unable to accommodate the inexorable movement of the Pacific Plate past the North American Plate, and that means it’s only a matter of time before one of those stuck segments gives way, producing a large earthquake, says the study’s lead author, Jim Lienkaemper, a research geophysicist at the U. S. Geological Survey.

In fact, there’s a nearly 70 percent chance that one of them will rupture within the next 30 years, Lienkaemper says. Of the four fault segments most likely to break within the next 30 years, the Hayward fault is of most concern.

“The Hayward Fault is the one that affects the most people and infrastructure,” Lienkaemper says. But a rupture on any of the others could also have devastating effects, potentially disrupting drinking water supplies by damaging the tunnel between the East and West Bay as well as between the northern and southern parts of the state.

No one knows exactly why certain sections of the fault lock up. It’s possible that bumps and crevices on the surfaces that need to slide by one another jam it up, says Arthur Lerner-Lam, a research professor and deputy director of Columbia University’s Lamont Doherty Earth Observatory, who was not involved with the study. “A lot has to do with whether there are bends in the fault trace” — zigs and zags that can hang the fault up until enough pressure builds to break through.

Experts say they hope the new study will energize individuals, governments and businesses to retrofit older structures to make them safer. Homes, for example, should be bolted to their foundations. Structures made from rigid substances like brick or concrete need to be reinforced. The recent Napa Valley earthquake might have helped nudge Northern California residents out of their complacency. But Archuleta worries that people will still ignore the new warning because of the forecast's long-range nature — 30 years — and procrastinate on the upgrades needed to make their homes more earthquake resilient.

People need to realize that this doesn’t mean you’re safe for 30 years, he says. “What they need to think about is that it could happen tomorrow or a week from tomorrow,” he explains. “We don’t know when, but we do know that inevitably there will be an earthquake.”

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