Geologic Assessment: Alan Greenspan or Pete Rose?
Fred Schwab

Life is risky. In response, some people live cautious lives, prepared for most eventualities. I am like Alan Greenspan: careful, methodical and prepared for the worst. I have an umbrella insurance policy and even pay $70 monthly for a dental plan that as best I can tell only covers things you don’t have done. Maybe the Pete Rose approach is better: Throw caution to the wind, do what you want to do (despite the rules) and hope you don’t get caught.

In preparing for geological hazards and natural disasters, does society have the same two options? For example, last December’s earthquake near Bam, Iran, claimed at least 30,000 lives. Caution might have led to more care in choosing what was built where and how. Certainly the dinosaurs should have chosen the Greenspan approach and taken the collision option on their “rent-a-planet” contract.

A look at death rates might help decide whether the Alan Greenspan or Pete Rose approach works best in assessing geological risk. In the last decade of the 1990s, about 2.5 million Americans died annually. Disaster-related yearly death rates in the United States include the following: floods, 176 victims; lightning, 147 victims; landslides, 59 victims; earthquakes, 29 victims; tsunami, 3 victims; and volcanoes, 1 victim—for a total of 415 (Rogers and Feiss, People And the Earth, 1998). While frightening, the numbers are trivial when compared with the number of victims of motor vehicle accidents (about 48,000), suicide (roughly 36,000) and murder (more than 29,000 yearly).

Thus, over the short term, geological hazards are minor killers. Significantly more money should be spent setting and enforcing reasonable rules on weapons possession, drivers’ education, psychotherapy, marriage counseling and maybe even yoga, rather than earthquake site selection and tsunami barriers. Folks in Seattle and Portland don’t need oxygen tanks and face masks to protect them from a rare episode of Cascade volcanism. Lightning kills, but even the Federal Emergency Management Agency (FEMA) would not mandate portable, individual lightning rods.

This view is underscored when disasters are quantified on the basis of dollar cost rather than deaths. Some of the more costly natural catastrophes of the 1990s (data from the 2004 The World Almanac and Book of Facts as well as Rogers and Feiss) include the earthquake in Kobe, Japan, in 1995 ($140 billion), Hurricane Andrew in 1992 ($30 billion) and floods in the U.S. Midwest in 1993 ($15 billion).

While these costs may seem expensive, in 2002 alone, U.S. citizens spent $81 billion on tobacco products and $49 billion on footwear. Military operations in Iraq and Afghanistan are projected at almost $130 billion for 2003 and 2004, with another $40 billion slated for rebuilding. On a per capita basis, the great Midwestern floods cost each of us $60; Hurricane Andrew about twice that; and the 1989 Loma Prieta, Calif., earthquake roughly $40 for damages and repairs. Again, the costs are not trivial, but compare it to the $5,805 each American spent for medical costs and health insurance in 2003.

Unfortunately, rare but especially devastating notable natural catastrophes complicate simple cost and effect analysis. The 1902 volcanic eruption of Mount Peleé, Martinique, killed 28,000 people; the 1976 earthquake near Tangshan, China, killed 255,000; and the 1931 floods of the Huang He River in China claimed almost 4 million victims. Do we plan for or around such disasters in heavily populated areas?

Assessing and managing geological risks are difficult, but unlike calculating historical and political risks. Geologists can examine the historical record of natural hazards and assign a crude predictability to frequency, location and intensity. In that way, researchers can help society better plan for these events in a clear methodical way.
Seth Stein and Joseph Tomasello clearly demonstrate how geologists are best equipped to prepare society to mitigate natural risks. In an Ed/Op article in the Jan. 1 New York Times, they argue against the blanket application of stringent earthquake-resistant standards, like those of California, for site-selection and building construction. FEMA has been recommending precisely that option nationwide.

Stein and Tomasello point out that the California codes represent “overkill” if applied to the New Madrid fault zone that extends from Missouri south and west into Tennessee. They believe that insufficient attention has been paid to adequately weighing costs versus benefits. For example, they guesstimate that applying California code to Memphis buildings would increase construction costs by 5 to 10 percent, even though a building in Memphis loses only about 1 percent of its value over its 50-year life because of earthquakes.

The authors also emphasize the tradeoff: Money spent retrofitting older schools and hospitals or constructing new, ‘quake-proof’ structures is obviously thus unavailable for teachers’ salaries, flu shots and defibrillators. They favor objective assessment done by outside analysts who carefully weigh the delicate balance between safety, health and risk —keeping in mind geological factors.

In other words, take a mixed approach: Take the time and make sure that the appropriate people get things right, and keep in mind that even sensible solutions require a touch of Pete Rose’s willingness to tolerate acceptable risk.

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Back to top