

# Coming Crises and Their Solutions



An American's Handbook  
to Future Game Changers

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## Crisis #11

# Natural Catastrophes

Tidal waves, Earthquakes, volcanoes, hurricanes, tornados, droughts, floods, and landslides will plague even the most densely populated regions on Earth and cause famines and pandemics. Inevitable natural disasters will claim countless human and animal lives. The proponents of radical climate and sea-level changes will likely have to retract their worst-case scenarios as new research defines the natural cycles in play. If a planet-wide calamity does occur, whether humanity will have the luxury of ameliorating its consequences will depend entirely upon its causes, its duration, and the state of our readiness with technology. A biblical flood with extreme climate change is not likely in this century—or the next.

It does not take a planet-wide calamity to adversely affect the entire planet. For example, the land bridge of Central America between North and South America was formed by volcanoes, many of which are still active. Within 785 miles north to south, there are thirty-four volcanoes, of which twenty are active, more or less constantly, spewing thousands of tons of pollutants into the atmosphere. (By way of comparison, the state of California measures 1,200 miles N-S.) The narrow little country of Costa Rica has several volcanoes spewing pollutants at all times. Its Arenal volcano is always active, always erupting and is a constant draw for tourists to watch its fireworks—particularly at night.

Closer to the capitol, the Poas and Irazu volcanoes are mildly active, but the Turrialba volcano is estimated to be emitting a thousand tons of CO<sub>2</sub> and between a thousand to three thousand tons of sulfur dioxide daily without being classified as erupting since there is no outflow of magma, just gas and ashes. Much of the plant life downwind has been killed by acid rain. There is nothing we can do about that!

There are approximately 450 active volcanoes on land all along the “Rim of Fire” surrounding the Pacific Ocean, plus many thousands of submarine volcanoes of which no less than ten thousand are actively spewing ash, magma, and heat into the seas—and sometimes into the atmosphere. Another sixteen thousand-plus at the mid-oceanic rifts are constantly oozing magma. In 2009 a submarine volcano was discovered off the coast of Sumatra that is nine miles across its base and fifteen thousand feet (three miles) high—entirely submerged. Cycles of volcanic activity could be causing the “El Nino” phenomena, the melting of Arctic and Antarctic ice and the acidification of the oceans. Nevertheless, no truly extreme climate changes are expected this century, but natural cycles will continue—no doubt some compounded by human activity. We know very little about ocean-floor volcanoes. Researchers are amazed at their recent discoveries and now estimate the total number of volcanoes in the hundreds of thousands.

A number of disasters are overdue. California now has a 99 percent chance of a release of the San Andreas Fault on the order of Richter 8-12 before 2040. It is projected to possibly move all of Los Angeles thirteen meters (forty-two feet) northward—closer to San Francisco—that is, *if* it does not become an island separated from the mainland by moving westward (according to geologists, not quacks). If the east-west Garlock fault also releases, the state will effectively be cut in half for a time until vital water and electricity, pipelines, railroads, highways,

communications, and airports can be restored. Such a calamity is predicted to kill at least ten thousand people, injure fifty to one hundred thousand and cause \$200-500 billion in damage. Some part is predicted to occur within thirty years. But we are not ready, nor do we have the funds to rebuild.

In addition, a recent 6.5 offshore Earthquake gave warning of new activity in the Cascadia fault along the Pacific Northwest shoreline. The last time this subduction zone released in 1700 (experts think) with approximately a Richter intensity of 9.0, it sent a tidal wave all the way across the Pacific Ocean to Asia. A similar event has a 10-15 percent likelihood of occurring in the next twenty to thirty years. Our Earth is in constant turmoil from within, and we should not be surprised by any new geological events. But, we should be better prepared.

A gigantic oceanic Earthquake in Southeast Asia reportedly moved the entire 474,000-square-kilometer island of Sumatra several meters and caused devastating tidal waves that claimed 270,000-plus lives. Another devastating Earthquake struck Pakistan and Cashmere, killing 80-100,000, while repeated "quakes" killed tens of thousands in Iran, Turkey, and southern Asia.

The latest Earthquake-resistant buildings withstand nothing greater than a Richter 8.0 without critical damage. The reason 230,000 people died in a 7.0 in Haiti is that none of their buildings met modern standards. The only clue we have to preventing major Earthquakes occurred when a "hot rocks" geothermal well in Europe, of a shallow three thousand meters (ten thousand feet), penetrated near a fault line and set off a series of minor shakes. Apparently the water pumped down to lubricate the drilling process caused a surprising but nearly negligible release of energy. Further drilling was aborted. The method of drilling down to lubricate a fault was proposed in California some fifty years ago along the San Andreas Fault

but was never completed because of prohibitive liability laws. The gravest concern of a major event is that California's fiscal crisis will prevent adequate emergency response and add to the casualties. If that occurs, survivors will abandon the state en masse—but too late.

On March 10, 2010, Chile was subjected to one of the strongest Earthquakes—a 9.5 that caused a tidal wave that did an estimated billion dollars in property damage. Within six months, Chile was subjected to six Earthquakes measuring 5.8 or more that spawned two killer tidal waves. The greatest tidal wave ever measured occurred on January 9, 1958, at Lituya Bay, Alaska. It measured five hundred meters (1,640 ft.) to its high-water mark inland! Earthquakes are the deadliest disasters known to man—so far. Since 1900, they have killed more people than all wars in history—combined.

The recent 9.0 Earthquake and tsunami that devastated the northeast coast of Japan and seriously damaged four nuclear power generating plants actually moved the whole island eight feet! Its cost in human lives (twenty-eight thousand) and property damage was unbelievable. The ocean rose as much as fifty-six feet and swept five miles inland. Everyone has seen the incredible damage on TV and watched water turning buildings into matchsticks and cars and boats and everything else into rubble. All four nuclear reactors experienced dreaded meltdowns and released radioactive gases into the ocean and the atmosphere, minute amounts of which reached our west coast. It necessitated the long-term evacuation of 250,000 Japanese in a thirty-kilometer radius. (The US embassy advised its personnel to stay fifty miles away!) This incredibly powerful Earthquake spawned a second tidal wave—in the opposite direction—that caused fifty-eight deaths in Hawaii and millions in property damage. It also caused two deaths in Crescent City, California, and at least one million dollars in damage to the

docks and many of the boats anchored there.

Natural disasters happen constantly. Heat waves in Europe occurred simultaneously with unusually cold weather in South America. Both poles received abnormal amounts of precipitation while major farmlands experienced either floods or prolonged droughts. Food crops have been devastated by droughts and floods. Droughts in Australia were seemingly balanced (but not helped) by torrential rains in China. Killer heat waves, electric power overloads, and water shortages must lead to research for more effective conservation measures in our future.

Regional disaster alert systems are just beginning to be implemented, but no global alert protocol exists for a Species Ending Event (SEE) such as an asteroid impact. The danger of impacts by Near Earth Objects (NEO) is real and inevitable. Until a new infrared satellite discovered four hundred more, we only knew of twelve hundred NEO, one kilometer or more in diameter, of which 192 represented the potential for a catastrophic event. There is a record of one major collision every hundred years. The last impact occurred in 1906 at Tunguska in Siberia. So, here we have another disaster cycle that is overdue. Now we have another series of potentially catastrophic events when hundreds of multi-ton satellites end their usefulness and are allowed to drop back down onto Earth— out of control.

Elements of the technology to intercept and destroy—or at least change the path of an asteroid—exist but no international decision mechanism is in place. NASA can enhance its reputation by developing a space “garbage truck,” an orbital vehicle to sweep up all the debris that constitutes a danger to the space station, satellites, and astronauts—and soon to come—space tourists. The Space Safety Agency (it already exists) estimates that there are now over twenty thousand pieces—from a single bolt to a section of fuselage—weighing a combined total of

5,500 tons in low orbit that pose a grave danger to further activities in Earth orbit. Proximity radar can evolve together with a laser canon to eliminate the hazard of both space garbage and incoming cosmic NEOs. Scientists think this system can be developed rapidly to intercept, deflect and or destroy space junk and NEOs, but NASA is (foolishly) working on sending men to Mars. There is no strategic value of a successful manned voyage to Mars. At best, it would be a gigantic ego trip. A small portion of that budget should be invested in research where we know it will save lives.

It is time for plausible research programs into interdicting the worst tornadoes and hurricanes that annually kill thousands of people worldwide and cause billions of dollars in damage. At least, we need to learn how to minimize them. There exist a number of plausible approaches from cloud seeding to drone-carried directional explosives—which, of course, would have to be employed over unpopulated areas. In any event, a few million dollar's worth of research might easily produce billions of dollar's worth of rewards.

Psychologically, the future appears quite bleak when we realize all of the catastrophes that we and our poor planet face statistically every day. We should not be discouraged nor stampeded into taking measures that would affect the quality of our lives. That remains as true of extreme climate change as it does of asteroids—or any other potential threat.

Human beings can only do so much against nature, and once we have taken reasonable precautions, fogetaboutit!