

MAP KEY

- Volcano
- Hurricane
- Landslide
- Tsunami
- Earthquake
- Tornado
- Avalanche
- Flood
- Major faults
- Volcano risk
- Tsunami risk
- Hurricane zone
- Tornado zone
- Largest storm of its kind
- Danger zone



Wreckage from the 1964 Alaska tsunami



Remnants of the 1900 Galveston hurricane



Hurricane Mitch set off landslides in 1998



ALTHOUGH POPULATION TRENDS HAVE LED MORE PEOPLE TO BE AT RISK THAN IN THE PAST, CATAclysmic NATURAL EVENTS ARE NO MORE COMMON NOW THAN THEY'VE EVER BEEN. HERE, A HISTORY OF THE PLANET'S MOST DRAMATIC OUTBURSTS, AND A LOOK AT THE DANGER ZONES WE'VE CHOSEN TO CALL HOME BY AMANDA MacMILLAN

# the violent earth

- |                                    |                                   |                                |                                  |                               |                                    |                        |                          |                                  |                              |                              |                              |                               |                             |                        |                            |
|------------------------------------|-----------------------------------|--------------------------------|----------------------------------|-------------------------------|------------------------------------|------------------------|--------------------------|----------------------------------|------------------------------|------------------------------|------------------------------|-------------------------------|-----------------------------|------------------------|----------------------------|
| <b>1</b> 1964<br>Northwestern U.S. | <b>2</b> 1980<br>Washington State | <b>3</b> 1906<br>San Francisco | <b>4</b> 1903<br>Alberta, Canada | <b>5</b> 1925<br>Central U.S. | <b>6</b> 1938<br>Northeastern U.S. | <b>7</b> 1900<br>Texas | <b>8</b> 1992<br>Florida | <b>9</b> 1998<br>Central America | <b>10</b> 2004<br>Hispaniola | <b>11</b> 1997<br>Montserrat | <b>12</b> 1902<br>Martinique | <b>13</b> 1780<br>West Indies | <b>14</b> 1999<br>Venezuela | <b>15</b> 1970<br>Peru | <b>16</b> 1755<br>Portugal |
|------------------------------------|-----------------------------------|--------------------------------|----------------------------------|-------------------------------|------------------------------------|------------------------|--------------------------|----------------------------------|------------------------------|------------------------------|------------------------------|-------------------------------|-----------------------------|------------------------|----------------------------|

The only tsunami to cause fatalities in the continental U.S. was set off by Alaska's 9.2-magnitude "Good Friday" quake. Twenty-foot waves hit from Alaska to California, killing 123 people, including 10 who drowned when 250 homes and businesses were washed away in Crescent City, California. **DEATH TOLL: 123**

A 5.1-magnitude earthquake on May 18, 1980, triggered the eruption of Mt. St. Helens. The explosion leveled 230 square miles of forest and darkened eastern Washington with a blanket of ash. **DEATH TOLL: 57**

Half of the city's 400,000 residents were left homeless after the 8.3-magnitude San Andreas Fault quake. The event is remembered for the scar of broken ground that ran half the length of the state and for the fires that consumed more than 500 downtown city blocks. **DEATH TOLL: 700**

A sudden drop in temperature contributed to the collapse of Turtle Mountain, sending 30 million cubic meters of limestone tumbling downhill and burying the town of Frank in what is still North America's deadliest landslide. **DEATH TOLL: 70**

North America's deadliest twister ripped 219 miles through Missouri, Illinois and Indiana, destroying 15,000 homes. A mile-wide funnel sucked up entire houses. "And living beings, too," the *St. Louis Post-Dispatch* reported. "A cow . . . was hurled into the village restaurant." **DEATH TOLL: 695**

The so-called "Long Island Express" generated the region's strongest winds ever (121 mph sustained, with peak gusts of 186 mph). A 12-foot surge destroyed cottages, marinas and yacht clubs at Narragansett Bay, Connecticut, while flooding washed away New York and New Haven railroad lines. **DEATH TOLL: 600**

Winds that reached 101 mph and 25-foot breaking waves hit the port of Galveston, Texas, destroying more than 3,500 homes and leveling one third of the city, making this storm the deadliest natural disaster in U.S. history. **DEATH TOLL: 8,000**

Although preparations limited casualties, Hurricane Andrew's storm surges of up to 17 feet destroyed 99 percent of all mobile homes in Homestead, Florida. The hurricane was the most expensive natural disaster in U.S. history, at a total cost of \$25 billion. **DEATH TOLL: 26**

In six hours, Hurricane Mitch pounded 25 inches of rain down on Honduras and Nicaragua, causing flash floods and mudslides that were responsible for more than 9,000 official deaths and another 9,000 missing. **DEATH TOLL: 9,000-18,000**

Floods and mudslides brought on by three days of late May downpours wiped out entire villages in southeast Haiti and the Dominican Republic. **DEATH TOLL: 2,000**

A government-sponsored evacuation saved Montserrat's population of 12,000 from an eruption that rendered the southern two thirds of the island uninhabitable. Montserrat's economy, agriculture and tourism industries have yet to recover. **DEATH TOLL: 20**

The colonial city of Saint Pierre—known to Europeans as the "Paris of the West Indies"—was leveled by the eruption of Mt. Pelée, the deadliest volcano of the 20th century. **DEATH TOLL: 29,000**

British and French naval fleets and more than 100 merchant ships sustained heavy casualties when the "Great Hurricane of 1780" swept through Barbados and St. Vincent. **DEATH TOLL: 22,000**

Two weeks of heavy rain set off landslides and flooding in and around the capital city of Caracas, causing \$1.5 billion in damage. Sprawling shantytowns that had developed in vulnerable areas contributed to the high casualty rate. **DEATH TOLL: 20,000-30,000**

An avalanche was responsible for almost a third of the 60,000 casualties from a 7.8-magnitude earthquake near Mt. Huascarán in the Andes. The mile-wide slab of ice traveled 11 miles at speeds of more than 100 mph, and swept away dozens of towns. **DEATH TOLL: 18,000**

When Lisbon, the capital city, was rocked by a 9.1-magnitude earthquake, residents ran to their ships hoping for safety at sea. But the tsunami that followed proved equally deadly, devastating ports in Spain and Morocco as well. **DEATH TOLL: 70,000**





1938 hurricane ramped New England. **6**

A rendering of the 1755 tsunamis in Lisbon. **16**

A slide buried this Russian town in 2002. **21**

Indonesia's Krakatau blew big in 1883. **27**

**MONSTER LANDSLIDE**  
A 1911 earthquake sent more than 1.5 cubic miles of rock and debris sliding into **TAJIKISTAN'S MURGAB RIVER** in history's most massive nonvolcanic landslide. The result: a 1,880-foot dam now holds back a 37-mile-long lake that could cause catastrophic flooding were it to break in another quake. **DEATH TOLL: 90**



**MONSTER HURRICANE**  
If 1979's **SUPER-TYPHOON TIP** had touched down over the U.S., the storm spiral would have covered nearly half the country—it was 1,350 miles in diameter, with winds of 190 mph. Luckily, the largest storm system ever recorded never left the northwest Pacific Ocean. **DEATH TOLL: 0**

**MONSTER EARTHQUAKE**  
At a magnitude of 9.5, the **GREAT CHILEAN EARTHQUAKE** of 1960 was the strongest ever recorded. A 1,000-mile fault break sent seismic waves reverberating around the globe for days and set off tsunamis that reached as far as Hawaii, Japan, the Philippines and the U.S. West Coast. **DEATH TOLL: 2,230**



Elephants in the 2004 Indian Ocean tsunami. **26**

- 7** 8 B.C. Hannibal's army
- 18** A.D. 79 Mt. Vesuvius, Italy
- 19** ~1500 B.C. Crete
- 20** 1201 Egypt
- 21** 2002 Russia
- 22** 1948 Turkmenistan
- 23** 2003 Iran
- 24** 1989 Bangladesh
- 25** 1970 Bangladesh
- 26** 2004 Indian Ocean
- 27** 1883 Indonesia
- 28** 1931 China
- 29** 1920 China
- 30** 1556 China
- 31** 1923 Japan
- 32** 1707 Japan

of Hannibal's army, 2,000 of horses and several elephants were killed in branches as the Ethiopian general led his troops across the Alps from Spain to Italy. **DEATH TOLL: 3,000**

Vesuvius's was the first eruption in history to be described in detail by survivors, and it is still perhaps the most retold volcanic disaster tale. Ten feet of tephra crashed down on the cities of Pompeii and Herculaneum, instantly suffocating and burying thousands. **DEATH TOLL: 3,000**

At least one colossal tsunami swept over the Mediterranean island of Crete sometime between 1650 and 1410 B.C., wiping out the Minoan empire's capital city—quite possibly the metropolis that Plato referred to as the lost city of Atlantis. **DEATH TOLL: ~100,000**

A localized surge of earthquakes called a "seismic swarm" killed more than a million residents of Egypt, Syria and surrounding countries more than 800 years ago, making it the deadliest earthquake event in recorded history. **DEATH TOLL: 1.1 million**

Melting permafrost caused a 500-foot-tall chunk of glacier to break off a Caucasus mountainside, triggering a massive slide that buried the village of Nizhny Karmadon under 2.1 billion cubic feet of debris. A Russian film star and his crew were among those killed. **DEATH TOLL: 140**

More than 80 percent of the population of Ashgabat was killed in this 7.3-magnitude quake. Although the Stalinist media initially reported only 35,000 deaths, after five years of digging bodies from the rubble, the number was estimated at three times that. **DEATH TOLL: 110,000**

At least 500,000 people have been killed in Iranian quakes since A.D. 800 (including 500 killed this past February). The country's mud-brick homes contribute to the rate of damage; in the 6.6-magnitude quake that devastated the ancient city of Bam in 2003, more than 75,000 were left homeless. **DEATH TOLL: 43,000**

A tornado swept through the tropical delta of the Dhaka region of northern Bangladesh, leveling the town of Shaturia. The flat, low-lying region is more vulnerable to tornadoes than any other place in the world. **DEATH TOLL: 1,300**

The North Indian Ocean sees only two or three hurricanes a year, but they can be among the most violent on record (in 1991, a single storm killed 100,000). The deadliest hurricane ever hit this country's coast with 120 mph winds, flooding rains and a resultant storm surge. **DEATH TOLL: 300,000-500,000**

A magnitude-9.0 earthquake struck off the coast of Sumatra, causing a tremendously powerful tsunami that hit 12 countries and left millions homeless along the heavily populated Southeast Asia coastline. The wave killed more people than any other tsunami in history. **DEATH TOLL: 200,000+**

Indonesia has 130 active volcanoes, a world record. The giant Tambora killed 92,000 in 1815, but the most famous is Krakatau, whose pyroclastic flows and falling tephra killed 4,500 in 1883. Isles up to 50 miles away were hit by resultant tsunamis that wiped away 30,000 more. **DEATH TOLL: 36,000**

Summer monsoons regularly cause China's largest river, the Yangtze, to swell and overflow. The single worst natural disaster in history occurred in 1931, when millions died from drowning, starvation or infection. **DEATH TOLL: 3.7 million**

Thousands of dwellings carved into the clay cliffs and silt riverbanks of the Gansu region in western China collapsed following an 8.5-magnitude earthquake near the Tibetan border in 1920. The event is still known as Shan Tso-liao, or "when the mountains walked." **DEATH TOLL: 180,000**

A colossal tremor in the Shanxi region devastated eight provinces in 1556. Since then, more than 2.5 million people have died in Chinese earthquakes, making the country the world's deadliest earthquake zone. The 1556 quake was China's worst ever. **DEATH TOLL: 830,000**

An 8.3-magnitude earthquake struck just 25 miles from Tokyo and Yokohama—and their combined population of two million. Thousands of gas ranges fired up for lunch preparations contributed to the incineration of Tokyo's business and industrial districts. **DEATH TOLL: 143,000**

Eighty percent of tsunamis strike in the Pacific, and Japan has been a frequent victim. Local fishermen coined the term combining "tsu" (harbor) and "nami" (wave) after their villages were washed away. An 8.4-magnitude quake in 1707 generated one of Japan's deadliest waves ever. **DEATH TOLL: 30,000**