Expert Group Text

"Tsunami"

Somewhere on an ocean floor, two plates of Earth's crust press together. Suddenly, the tremendous force causes rock to fracture. The ocean floor quakes. The quake, in turn, jostles the water above it. A tsunami is born.

Tsunamis are oceanic seismic waves. They can travel with the speed of a jetliner. Some even circle the globe. In the open ocean, tsunamis appear as large swells of water. Boats ride over them with no problem. But as tsunamis approach land, they rise up to form colossal walls of water. The largest ones rise to over 80 feet (24 meters) high. Unlike an ordinary wave, tsunamis do not simply crash on shore. They can rush inland for 1,000 feet (300 meters). They result in terrible destruction.

A tremendous earthquake jolted the Indian Ocean on December 26, 2004. The resulting tsunami rose as high as 80 feet (24 meters). It struck the coast of Sri Lanka, Indonesia, India, and nearby nations. It killed over 230,000 people. The victims included both coastal residents and tourists from around the world.

Tsunamis are most destructive near their source. But they can remain dangerous for thousands of miles. In 1960 an earthquake struck off the coast of Chile. Tsunamis 35 feet (10.7 meters) high struck the Chilean coast. Fifteen hours later, tsunamis from the same earthquake struck Hawaii. They killed 61 people and injured 282. Eight hours after that, the tsunamis reached Japan and killed 180 more people.

What Is a Tsunami?

Some people call tsunamis "tidal waves." But they have nothing to do with tides. In Japanese, tsunami means "harbor wave." The name describes the way these waves can cover an entire harbor. They have done so many times in Japan's history. Indeed, Japan gets hit by more tsunamis than any other country. Its history books record at least 195.

Most tsunamis strike in the Pacific Ocean. Only about 10 percent of tsunamis occur in other oceans. Most Pacific Ocean tsunamis occur in a region called the Ring of Fire. This area is the site of many earthquakes. Most, but not all, tsunamis stem from undersea earthquakes. Others result from undersea landslides, volcanic eruptions, or other disturbances.

Anatomy of a Killer

Earthquakes last a few seconds to a few minutes. But the resulting tsunamis can pound coastlines for hours or days. To understand why, think of a rock thrown in a lake. The splash sends out ripples. Similarly, a quake or other undersea shock sends out seismic waves. But unlike the rock, the tsunami does not start at a single point. It starts at a large crack. The ground on one side of the crack suddenly lifts or sinks. All of the water above it also rises or falls. This may form a high point called a wave crest. Or it may cause a low point called a wave trough. Each movement sends out another wave.

In deep ocean, tsunamis can travel 500 to 600 miles (800 to 970 kilometers) an hour. Near shore, the rising seabed forces them to slow down. As the front of the wave slows, water piles up from behind. Most tsunamis are very weak. They reach heights of only a few inches (centimeters). But large tsunamis can rise to dangerous heights. They may have waves 80 feet (24 meters) high. They can dump more than 100,000 tons of water per 5 feet (1.5 meters) of coastline.

Out at sea, tsunamis can pass unnoticed. Coastal waters may grow eerily calm before a tsunami strikes. The approaching wave often pulls water out to sea just before it arrives. Onlookers may be tempted to explore the bared ocean floor. Such curiosity can prove deadly.

Tsunami Safety

The only correct response to a tsunami is to get out of its way! Most tsunami-prone areas have plans for moving coastal residents to safety. This usually involves quickly moving people inland.

Evacuation plans rely on tsunami warning centers to tell them when a tsunami might be coming. The centers have instruments that detect

earthquakes near or under the ocean. A warning system has been in place for the Pacific since 1948. The warning system was used in 2011. An earthquake struck off the coast of Japan on March 11, 2011. Within minutes of the quake, nations surrounding the ocean were warned—potentially dangerous tsunamis were headed their way. Those warnings allowed numerous communities to prepare to deal with possible tsunami waves. Unfortunately, the warnings were not enough to prevent thousands of deaths along coastal areas of Japan.

After the 2004 tsunami, work was started on an Indian Ocean warning center. It became active in 2006. Systems for monitoring the other oceans of the world have also been put in place.