Lituya Bay is located in southeast Alaska about 200 kilometers (125 miles) west of Juneau, Alaska's capital. It is a deep, T-shaped, 11-kilometer (7-mile)-long bay with a sand bar named La Chaussee Spit that separates it from the Pacific Ocean (Figure 9E). The largest wave ever authentically recorded occurred in Lituya Bay. Remarkably, the wave was witnessed by six people on board three small fishing boats that were near the bay's entrance (Figure 9E, top).
At about 10:00 P.M. on July 9, 1958, an earthquake of magnitude $M_w = 7.9^*$ occurred along the Fairweather Fault, which runs along the top of the "T" portion of the bay. The earthquake didn't produce the wave directly, but it triggered an enormous rockslide that dumped at least 90 million tons of rock—some of it from as high as 914 meters (3000 feet) above sea level—into the upper part of the bay. The rockslide created a huge splash wave (a long-wavelength wave produced when an object splashes into water) that swept over the ridge facing the rockslide area and uprooted, debarked, or snapped off trees up to 530 meters (1740 feet) above the water level of the bay—a full 87 meters (285 feet) higher than the world's tallest building, the Sears Tower in Chicago. As the giant wave raced down the bay toward the boats at a speed of over 160 kilometers (100 miles) per hour, it continued to snap off trees and completely overtopped the island in the middle of the bay.

During the summer in Alaska, it was still light enough at 10:00 P.M. for the people on board the boats to see the rockslide occur—and the giant wave bearing down on them. The Badger, a 13.4-meter (44-foot) fishing vessel, had its anchor chain snapped and was lifted up bow-first into the oncoming wave. Amazingly, the vessel surfed the wave over the sand bar! The two people on board reported looking down from a height of 24 meters (80 feet) above the tops of the trees on the sand bar, in an area where trees reach heights of 30 meters (100 feet). The Badger plunged into the Pacific Ocean on the other side of the sand bar stern-first, where it foundered and eventually sank. The people on board were able to launch a small skiff before the Badger sank and were rescued a few hours later, shaken but alive.

The Edrie was at anchor in the bay when the wave arrived. Its anchor chain snapped, and the vessel (including two people on board) was washed onto land. After the wave passed, the withdrawal of water washed it back into the bay, leaving the vessel largely undamaged. The two people on board the Sunmore were not nearly so lucky. The wave hit their vessel broadside, which capsized and sank the Sunmore, killing both people on board. The wave spread out into the Pacific and was even detected over six hours later at a tide-recording station in Hawaii, where the wave was only 10 centimeters (4 inches) tall.

The most noticeable damage to the shoreline of the bay included a trampoline of trees that extended around the bay and across the island (Figure 9E, bottom). The wave also knocked down all the trees on the sand bar and killed most of the shellfish living near the water's edge. Additionally, floating logs from the destruction filled Lituya Bay for many years.

Older knocked-down trees suggest that Lituya Bay periodically experiences rockslides that generate giant splash waves. For instance, there is evidence of a 120-meter (395-foot) wave in 1853, a 61-meter (200-foot) wave in 1899, and a 150-meter (490-foot) wave on October 27, 1936. Even though other events may have produced larger waves (such as the 914-meter (3000-foot) wave created by a meteorite impact in the Gulf of Mexico about 65 million years ago†), the 1958 splash wave in Lituya Bay stands as the largest wave in recorded history.

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**STUDENTS SOMETIMES ASK...**

*What is the record height of a tsunami?*

Japan holds the record because Japan's proximity to subduction zones causes it to endure more tsunami than any other place on Earth (followed by Chile and Hawaii). The largest documented tsunami occurred in the Ryukyu Islands of southern Japan in 1931, when one raised normal sea level by 85 meters (278 feet). In low-lying coastal areas, such an enormous vertical rise can send water many kilometers inland, causing flooding and widespread damage. The most deadly tsunami was probably the one that hit Aura, Japan, in 1703 and was responsible for an estimated 100,000 deaths.

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*See Box 5-3 in Chapter 5 for a description of the Cretaceous-Tertiary (K-T) impact event.*