Great Tsunamis:
1645 BC Thera
1755 Lisbon
1868 Arica
1883 Krakatoa
1946 Aleutians
1958 Lituya Bay
1960 Chile
1964 Alaska
Thera, Santorini
Mediterranean Sea

~1650 BC, Volcanic eruption, 50 foot high tsunami waves
Eruption and tsunami led to the downfall of the Minoan civilisation
Thera, Santorini

~1650 BC, Volcanic eruption, 50 foot high tsunami waves. Eruption and tsunami led to the downfall of the Minoan civilisation. 100,000 people may have perished. Affected the entire Mediterranean Sea.
Lisbon, Portugal

9:30 AM All Saints Day Sunday, November 1755
Probable magnitude ~ 8.7
Lisbon, Portugal

November 1755
Earthquake magnitude 8.7

- Produced a great tsunami - reached Britain & Caribbean
1868 Arica, Peru (now Chile)

5:12 AM April 18, 1906  Magnitude ~ 8.5
Subduction Zones

In subduction zones, one plate is pulled by gravity beneath another plate. Earthquakes occur along the interface between the plates.
1868 Arica, Peru (now Chile)
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- Subduction zone earthquake
- Magnitude 8.5 – 9
- 45 - 50 foot waves in Arica
- Recorded Pacific wide
- 25,000 deaths attributed to tsunami in Peru & Chile
- Damage in Hawaii, New Zealand & Japan
Krakatoa (Krakatau), Indonesia

1883 Volcanic eruption, 50 foot high tsunami waves, 36,000 tsunami deaths
Krakatoa

The Steamship *Berouw* deposited 1 mile inland. All 28 crew perished.
Krakatoa

- Strato-volcano - Eruption VEI 6
- 45 - 50 foot waves in Java and Sumatra
- Recorded in India
- 36,000 deaths
- Affect global temperature
1946 Aleutians

- Earthquake - magnitude 7.4
- 130 foot tsunami on Unimak Island Alaska - 5 deaths
- 160 deaths in Hawaii
- Led to Tsunami Warning System
- A “tsunami” earthquake - larger waves than expected for a 7.4 EQ
1946 Aleutians

- Cause of the tsunami still debated
- Now many believe a combination of earthquake + landslide
1958 Lituya Bay, Alaska

Source: July 10, 1958 Magnitude 7.9 earthquake triggers massive rockfall at head of Lituya Bay
Landslides

Submarine landslides or slides that start on land and fall into the ocean can cause tsunamis. Slides are often triggered by earthquakes.

1. Submerged landslide
2. Landslide starts tsunami
3. First positive tsunami wave
4. Tsunami spreads
1958 Lituya Bay

Highest tsunami runup ever recorded - over 1700 feet! 3 fishermen killed in the Bay, no effects elsewhere.
1960 Chile

Source: 2:11 PM May 22, 1960  Magnitude 9.5 megathrust earthquake on the Peru-Chile subduction zone
~1000 lives lost in Chile, 60 tsunami deaths in Hawaii 16 hours later, 140 tsunami deaths in Japan 22 hours later
Chile

- Pacific-wide tsunami
- At least 1000 tsunami deaths
- Megathrust fault rupture 700 miles long, 80 miles wide
- Arrived in Hawaii 16 hours later
- Arrived in Japan 22 hours after earthquake
1964 Alaska

Source: March 27, 1964 Magnitude 9.2
megathrust earthquake on the Alaska-Aleutians subduction zone
100 lives lost in Alaska, 16 tsunami deaths in California and Oregon