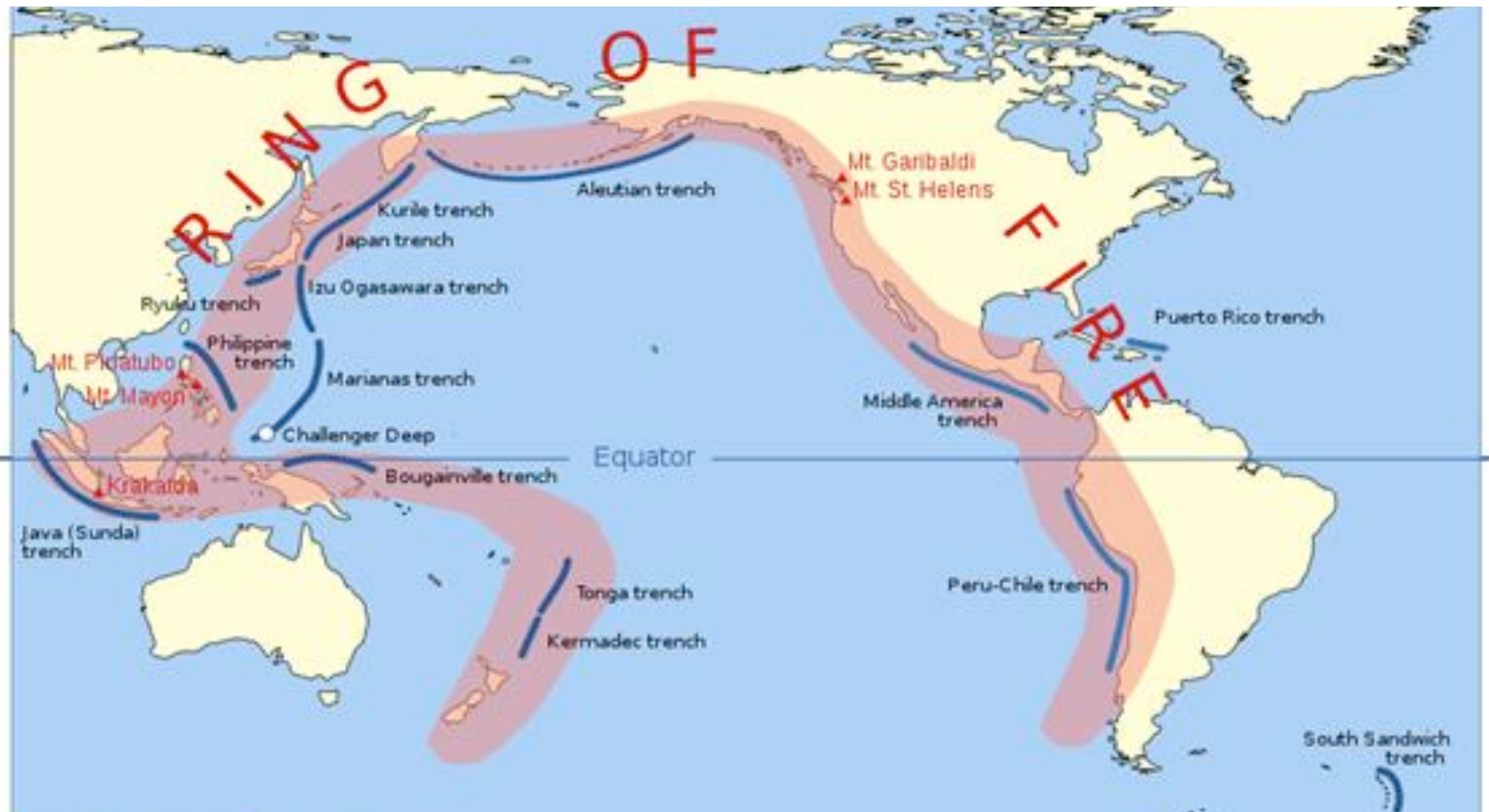


JAPAN

A map of Japan with a red dot indicating the epicenter of an 8.9 magnitude earthquake. Concentric red circles radiate from the epicenter, representing seismic waves. The word 'JAPAN' is written in large black letters at the top. A white box on the left contains the text '8.9 MAGNITUDE'. The word 'TOKYO' is written in black letters near the epicenter.

**8.9
MAGNITUDE**

TOKYO



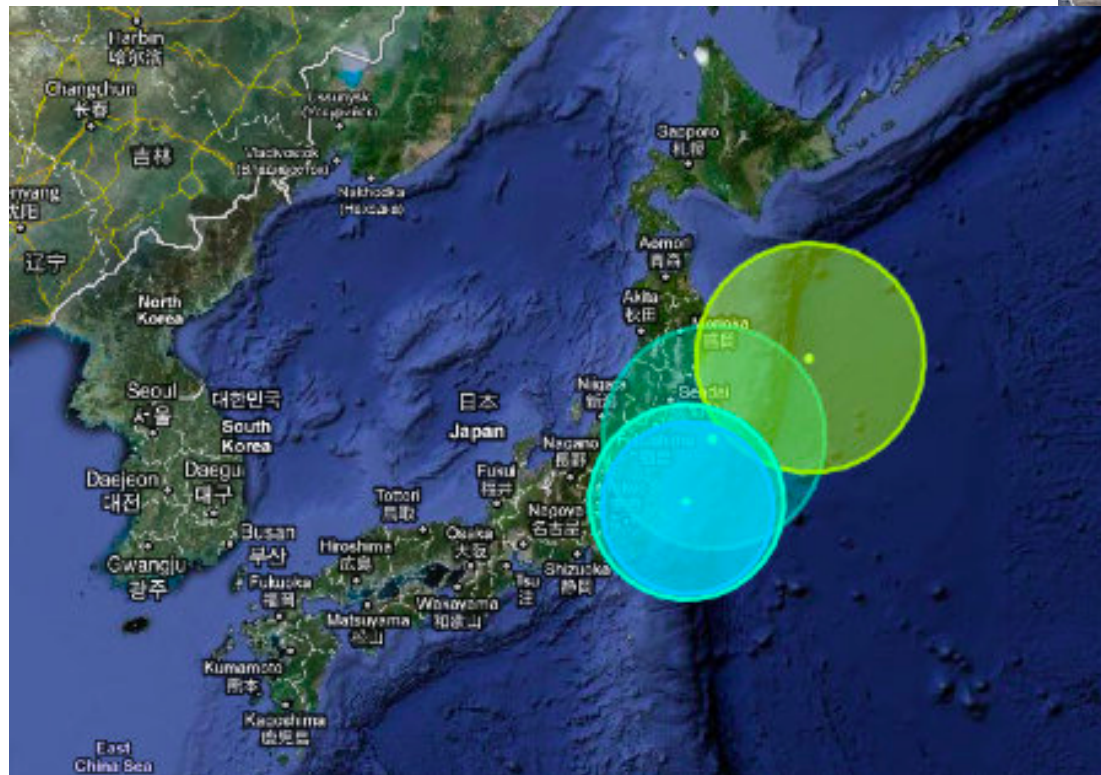
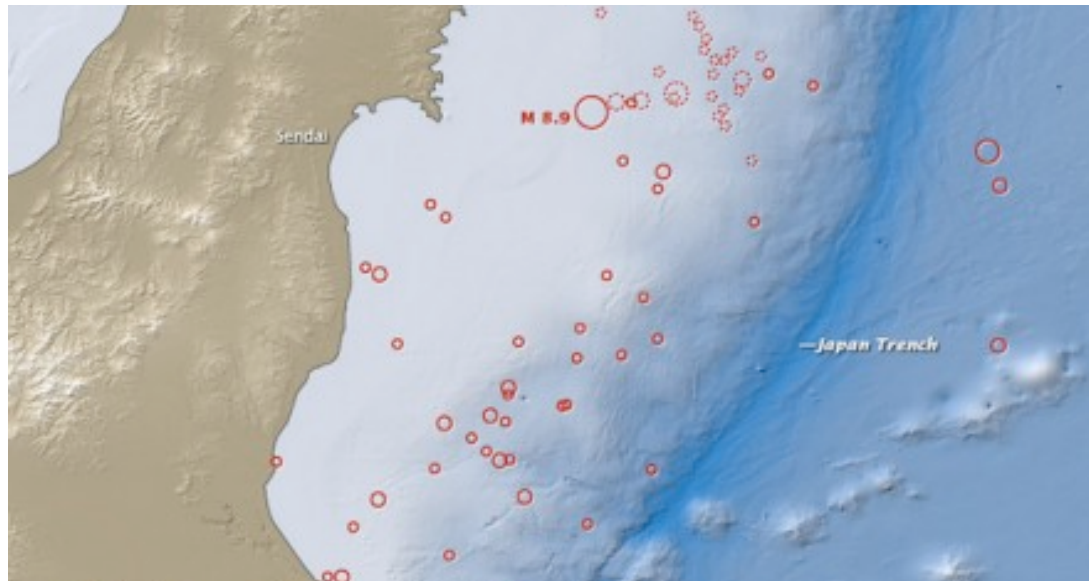


Major Volcanoes of Japan



Topinka, USGS/CVO, 1998; basemap modified from: CIA map, 1997; volcanoes from: Simkin & Siebert, 1994





Earthquakes-Chapter 11

~1 million/yr



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Measuring

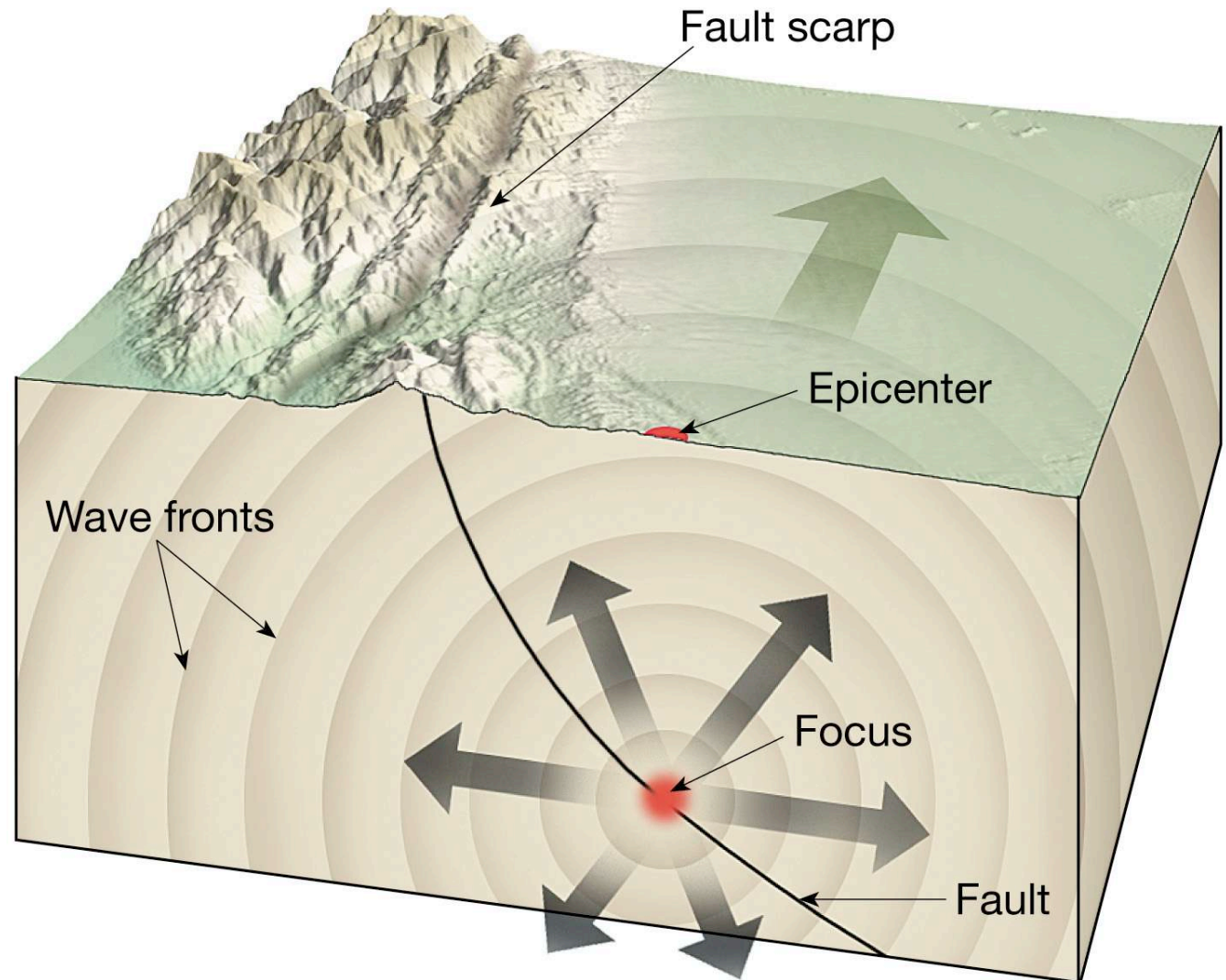
- Mercalli (1-12) v Richter (1-10...30x)



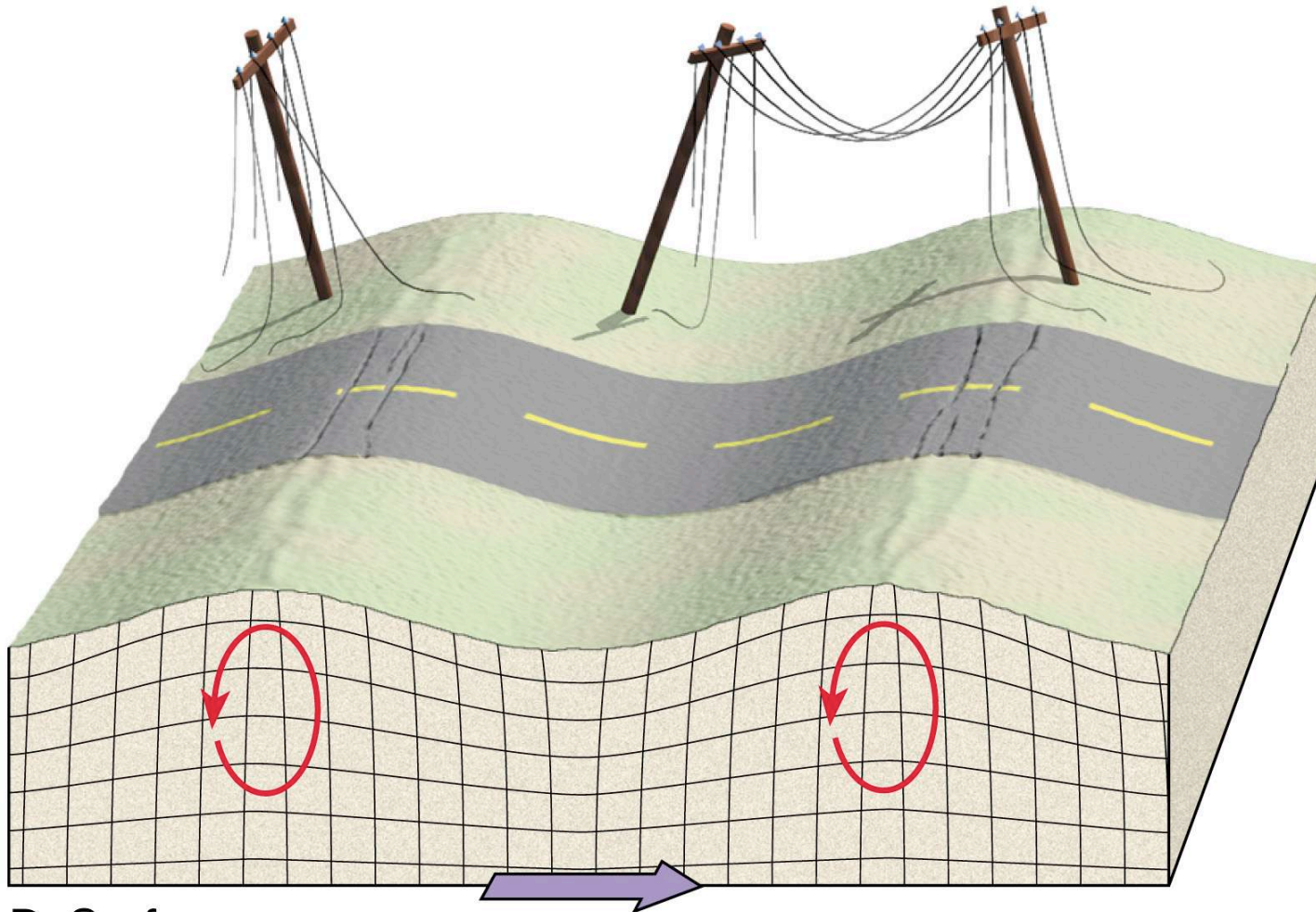
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Wave Energy

- P, S and L

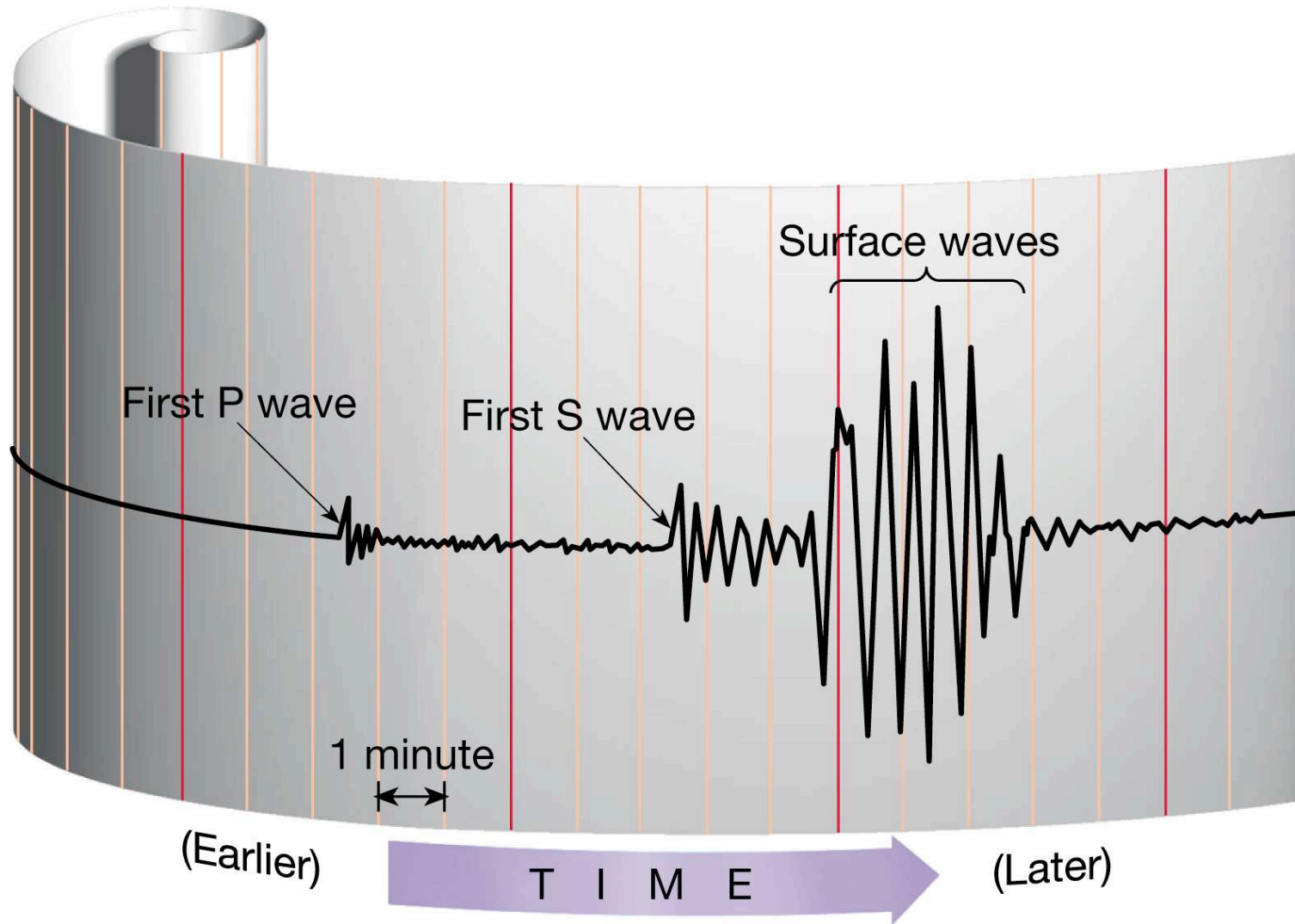


L Wave



D. Surface wave

Recording Earthquakes



Destruction





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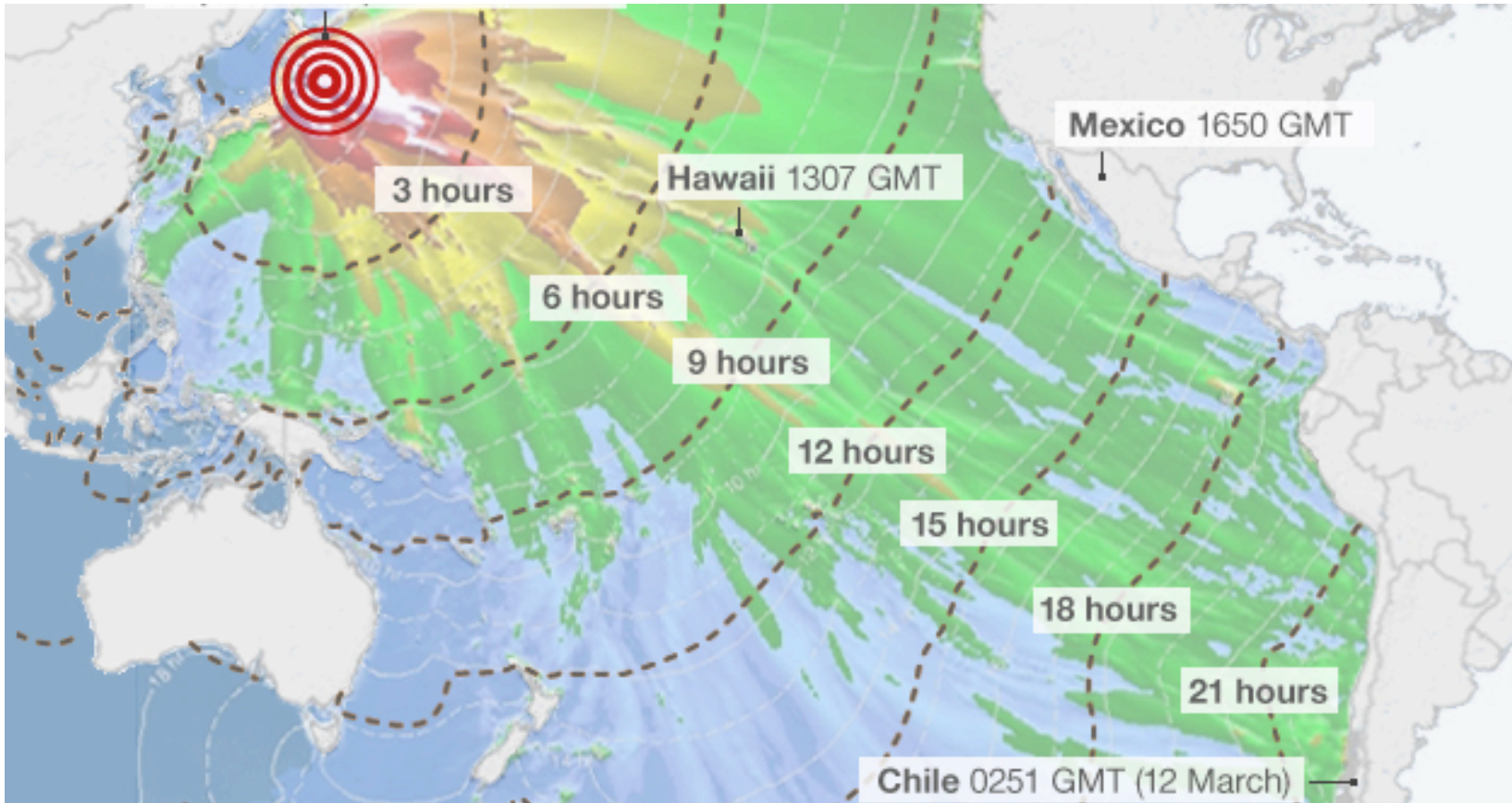
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Giant Whirlpool



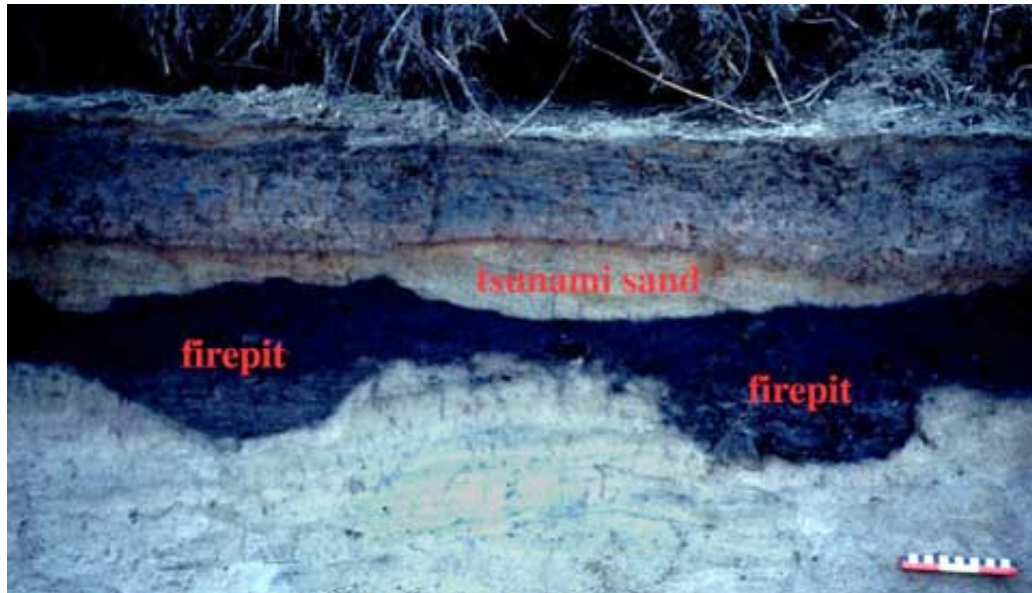


Tsunamis





Geologic Evidence



1700's in Oregon



Fires





Land Shifting

Japan lifted 8-13 feet!!

Fukushima Nuclear Power Plant

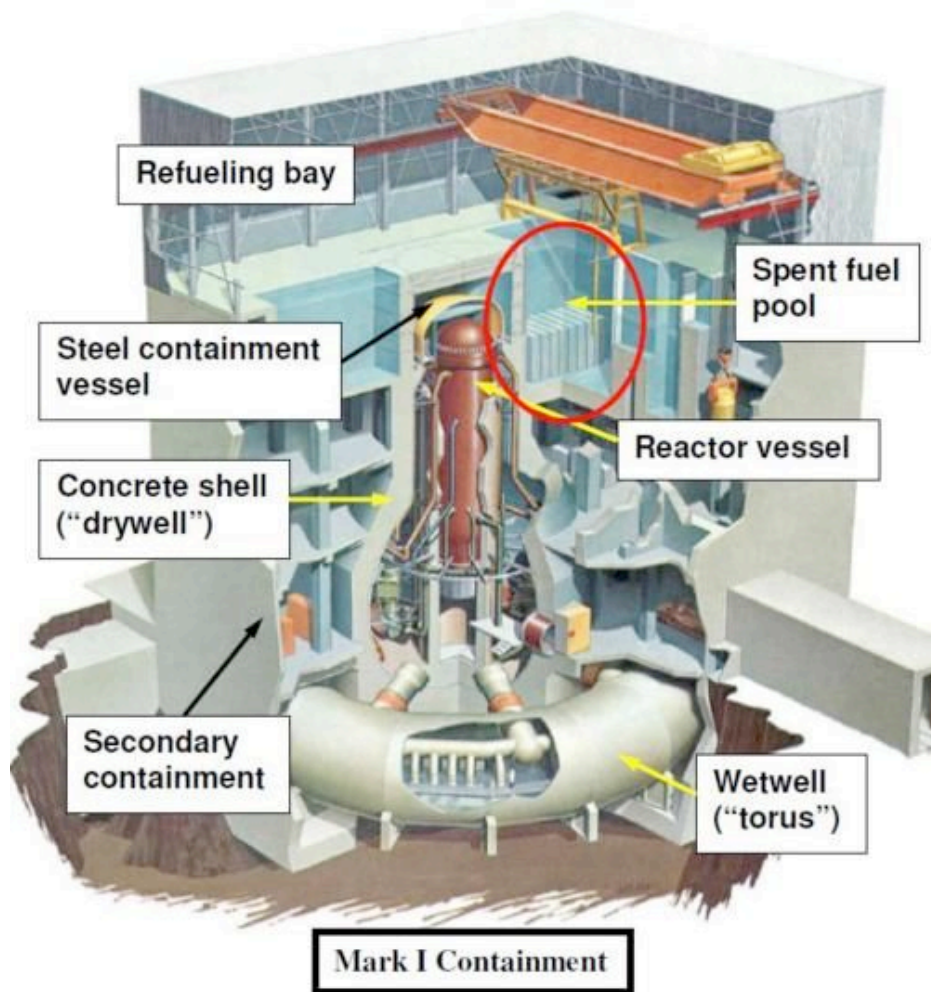


Fukushima

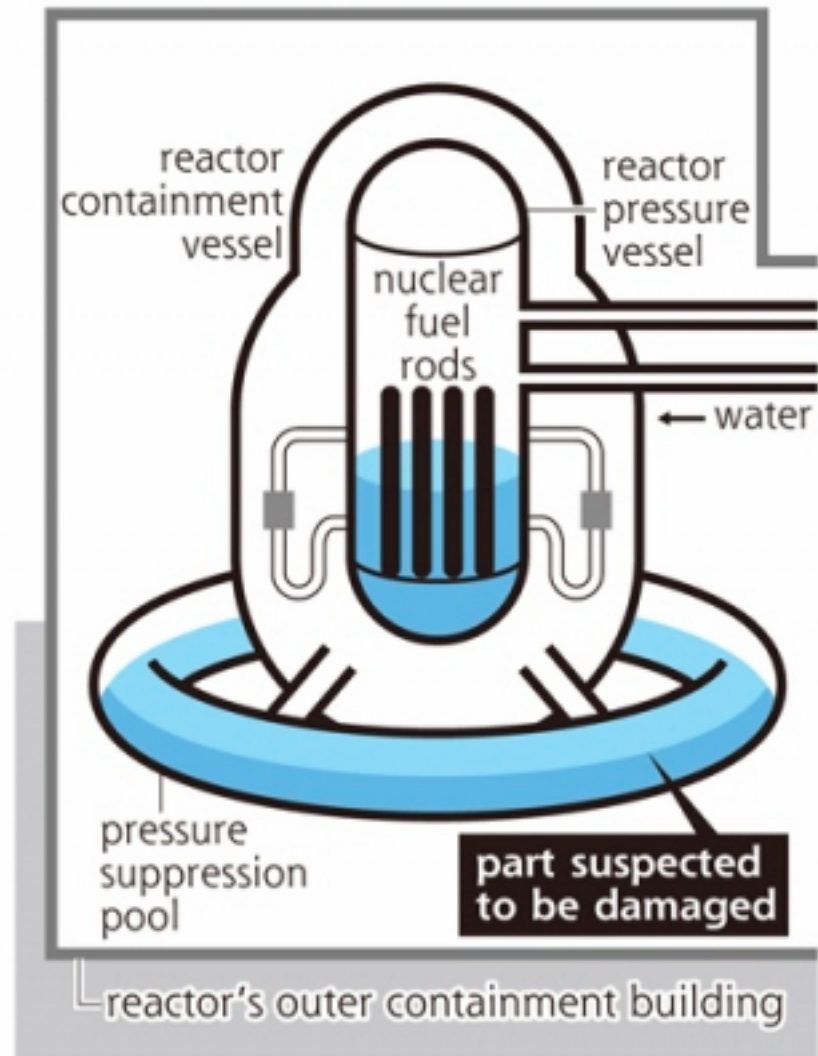


U.S. Response Forces

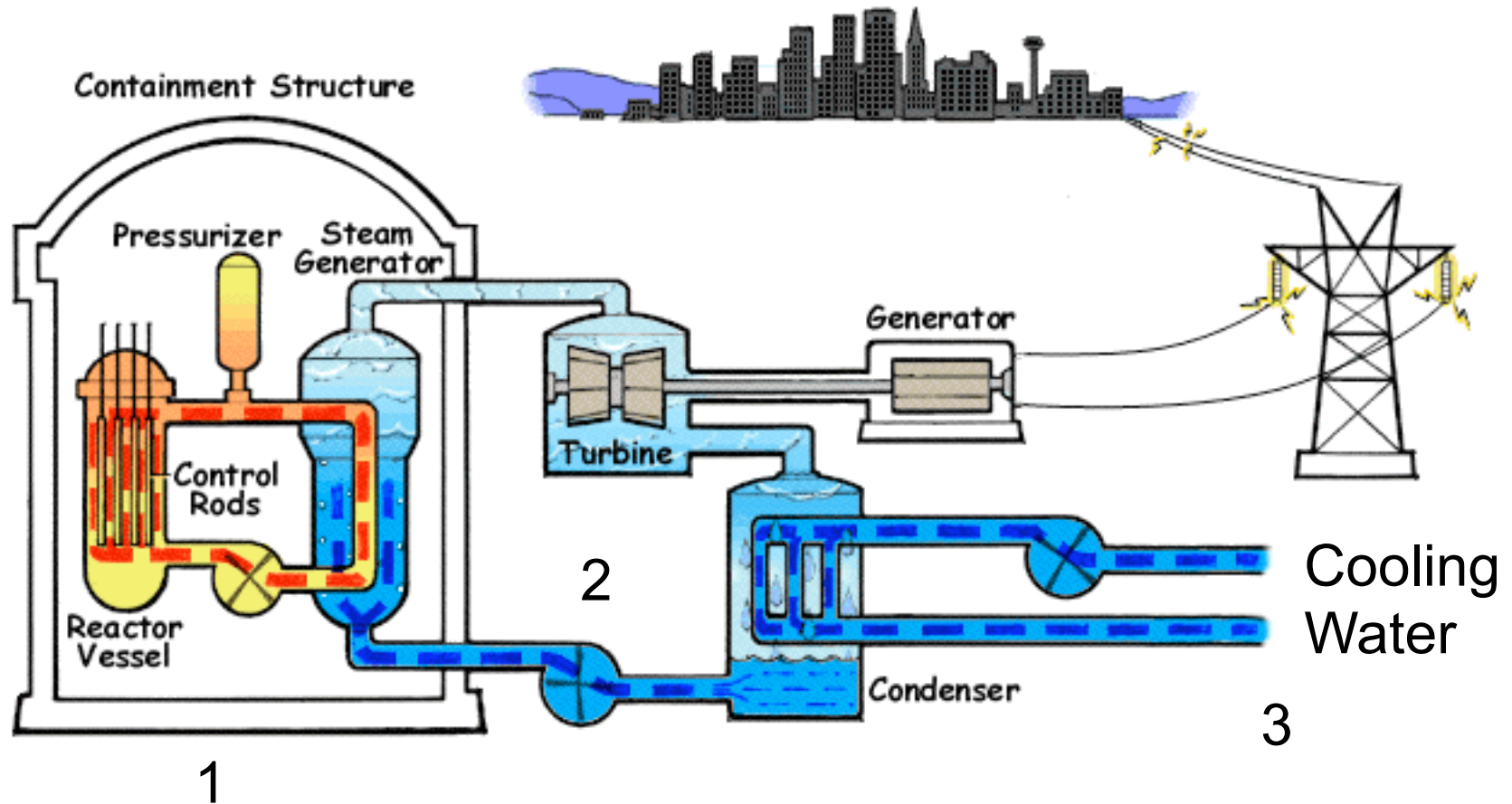




Fukushima No. 1 nuclear power plant's No. 2 reactor



Nuclear Steam Electrical Plants



Water used for Steam and Cooling--3 loops

Cooling Water Techniques



Reservoir Ponds



Rivers



Oceans

Glenrose, TX—60 miles away



Dinosaur Tracks



Summary of Japan's Earthquake

- Destruction with Tsunamis in the Billions
- Potential for Nuclear Disaster
- Earth speeds up -1.8 microsec
- Japan lifted about 8-10 feet
- Japan moved 13 feet closer to U.S.
- Axis shift 3-4 inches
- Loss of Life—perhaps 20,000

