

1995 Kobe Japan Earthquake

*Do not meddle in
the affairs of dragons,
for you are crunchy
and good with catsup.*

Emily L. Laity
September 16, 2005

Kobe Japan

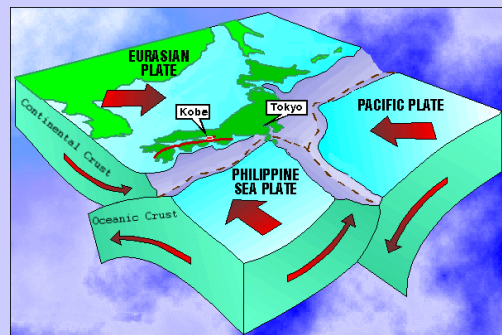
- Population: 1.5 million
- Japan's 6th Largest city
- World's 6th Largest port



Ground Shaking News

- When: January 17, 1995 – 5:46am
- How long: 20s solid rock
2-3min. Soft sediment
- Strength: 7.2 (JMA, shindo scale)
6.9 Richter
- Epicenter: 34.6N 135E
Nojima Fault
20 miles South of Kobe
- Displacement: 0.5m horizontal; 1m vertical
- Depth: 16km

Japan and Fun with Plate Tectonics



Place in History

- 13 major earthquakes in Japan since 1900
- Kobe second deadliest after the Kanto Earthquake in 1923 which claimed ~140,000 lives
- Kobe “costliest natural disaster to befall any one country” over \$150 billion

Earthquake Preparation

- Early Warning Systems
- Earthquake building codes/standards
- Earthquake drills at schools/businesses

Unprepared?

- Kobe believed less vulnerable than Tokyo region
- No citywide emergency plan
- Dependent on technology warning system
- No Warning

Casualty Report

- 6000+ dead
 - 5,502 during earthquake
 - ~800 more died of consequences
- 15,000 – 42,000 injured

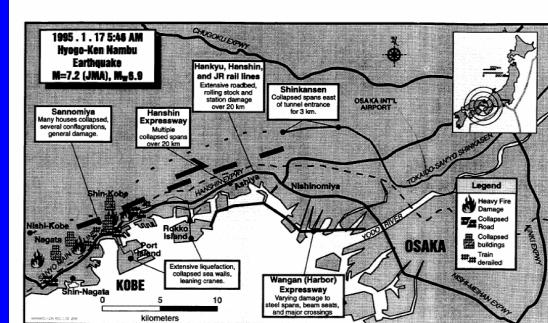
Causes of Death

- Direct Effects
 - “Direct Hit” earthquake
- Secondary Effects
 - Fires: 500 casualties
 - Building collapses
 - Landslides: 28 killed in Nishinomiya

Destruction

- 300,000 Homeless (1/5 the population)
- 400,000 Buildings Damaged/destroyed
 - 100,000 Houses destroyed
 - 185,000 partially destroyed
- Lifelines crippled (gas, water, phone)
- Major expressways collapsed
- Bullet train and subways derailed

Kobe-Osaka Region



Causes of Destruction

- Shallow focus
- Epicenter close to Kobe
- 300 Fires: over 7000 buildings burned
- Unstable tile roofs on wooden houses
- 1960's building code
- Liquefaction

This new building survived intact.

This wooden building was completely destroyed!

This 1960's concrete building collapsed in the middle.

Fault on Awaji Island



Government Criticisms

- Slow response time
- Refusing foreign aid
- Difficulties transporting supplies
- Poor communication services
- Lack of emergency shelters



Mitigation

- Water, electricity, gas, and telephone working by July 1995
- Trains in service by August
- Port running again one year later
- By 1999 Kobe economy at 75% - 95% pre-event capacity
- New laws passed for buildings and transport
- Increased earthquake monitoring devices

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