

# Chapter 1

## Preparing for Earthquakes and Tsunamis

### What Makes Earthquakes Happen?

#### Deep Ocean (Tectonic) Earthquakes

The ocean plates shift under the continental plates. When the edges of the plates strain and reach their limit, the edge of the continental plate recoils and causes an earthquake. A typical example is the 2011 Great East Japan Earthquake.



#### Characteristics

- Long period of shaking (1+ minutes)
- Likely to produce a tsunami
- Occurs at 90 – 150 year intervals

#### Examples

Tokai Earthquake, Tonankai Earthquake, Nankai Earthquake, Hokkaido Nansei-oki Earthquake, The Great East Japan Earthquake, Sumatra Earthquake, etc.

#### Earthquakes Caused by Active Inland Faults

These are caused by the displacement of active faults (inside the Eurasia plate).

The Great Hanshin-Awaji Earthquake is a typical example.



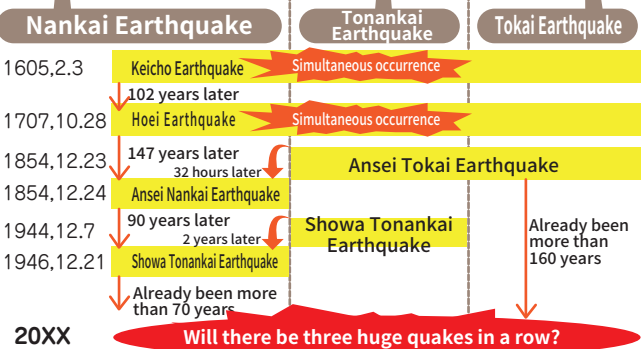
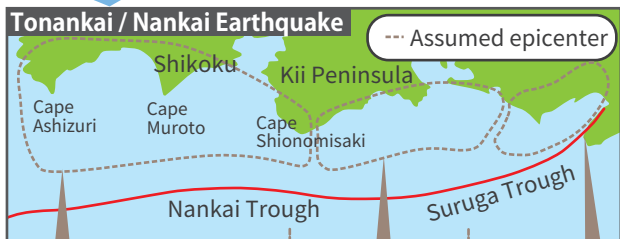
#### Characteristics

- Long period of shaking (10 – dozens of seconds)
- Strong shaking near the active faults due to the shallow epicenter
- Occurs at intervals of 1000–10,000 years

#### Examples

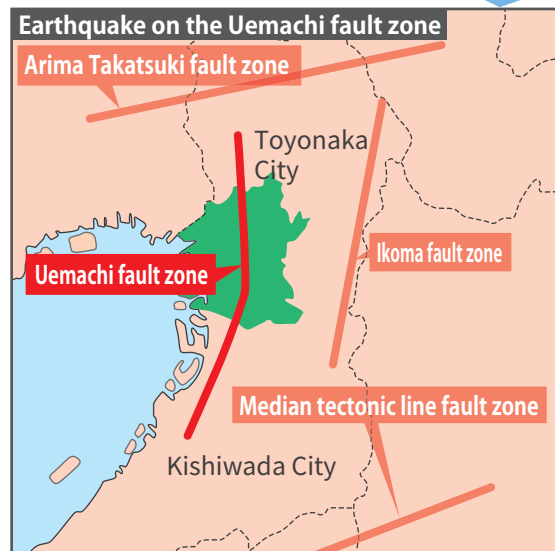
Nobi Earthquake, Mikawa Earthquake, The Great Hanshin-Awaji Earthquake, Kumamoto Earthquake, Niigata Chuetsu Earthquake, Niigataken Chuetsu-oki Earthquake, etc.

### Predicted Earthquakes



20XX Will there be three huge quakes in a row?

The Tonankai/Nankai massive earthquakes are predicted to occur in the first half of this century as M8 class earthquakes have occurred every 100 to 150 years in the past.



The Uemachi Fault Earthquake may occur in continental areas and could reach the M7 level. The Uemachi Fault Zone extends approximately 42km from Toyonaka City to Kishiwada City and runs through Osaka City. Other active faults are shown above.

### Earthquake Shaking and Damage

Seismic intensity 4

- Felt noticeably by most people
- Things that are suspended such as hanging lights swing hard.

Seismic intensity lower 5

- Most people are frightened and want to hold on to something.
- Dishes and books may fall from shelves.

Seismic intensity upper 5

- Hard to walk unless holding on to something.
- Unattached furniture may fall.



For detailed predictions of damage from the Great Nankai Trough Earthquake and the Uemachi Fault Earthquake, refer to the website of the Osaka City Office of Emergency Management.