Tokyo Conference on International Study for Disaster Risk Reduction and Resilience
Session on Trans-Disciplinary Study Approach for Disaster Risk Reduction - towards achieving resilience

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Earthquake Early Warning (EEW) provision in Japan – a result of comprehensive collaboration between science and society

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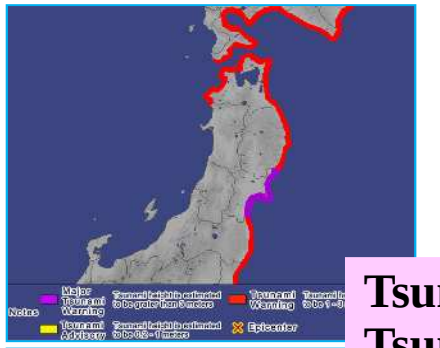
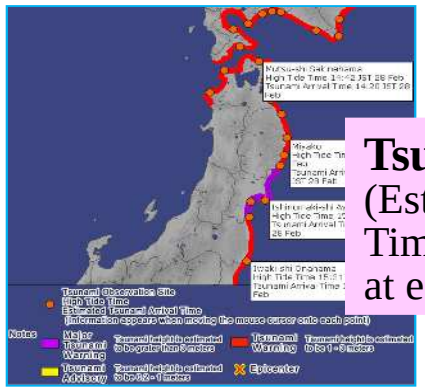
Time Flow of Issuance of Warning/Information on Earthquake and Tsunami by JMA

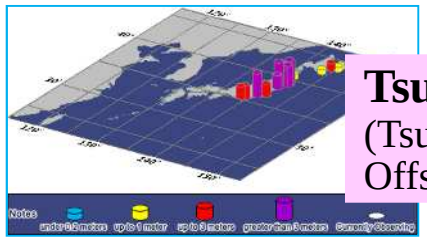


Tsunami Warning / Tsunami Advisory

Tsunami Information
(Estimated Tsunami Arrival Time and Height)



Tsunami Information
(Estimated Tsunami Arrival Time and High Tide Time at each place)

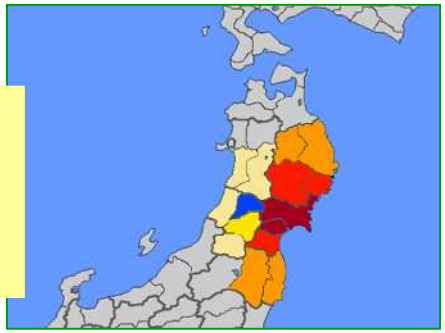


Tsunami Information
(Tsunami Observations at Offshore Gauges)

Earthquake Early Warning (EEW)
since 2007 (to the general public)

1.5 min.

Seismic Intensity Information
(Regions with seismic intensity 3 or greater)



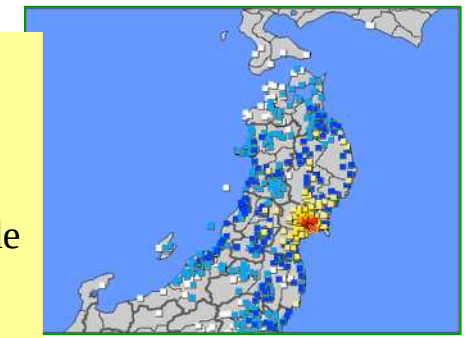
3 min.

Earthquake Information
(Hypocenter and Magnitude)

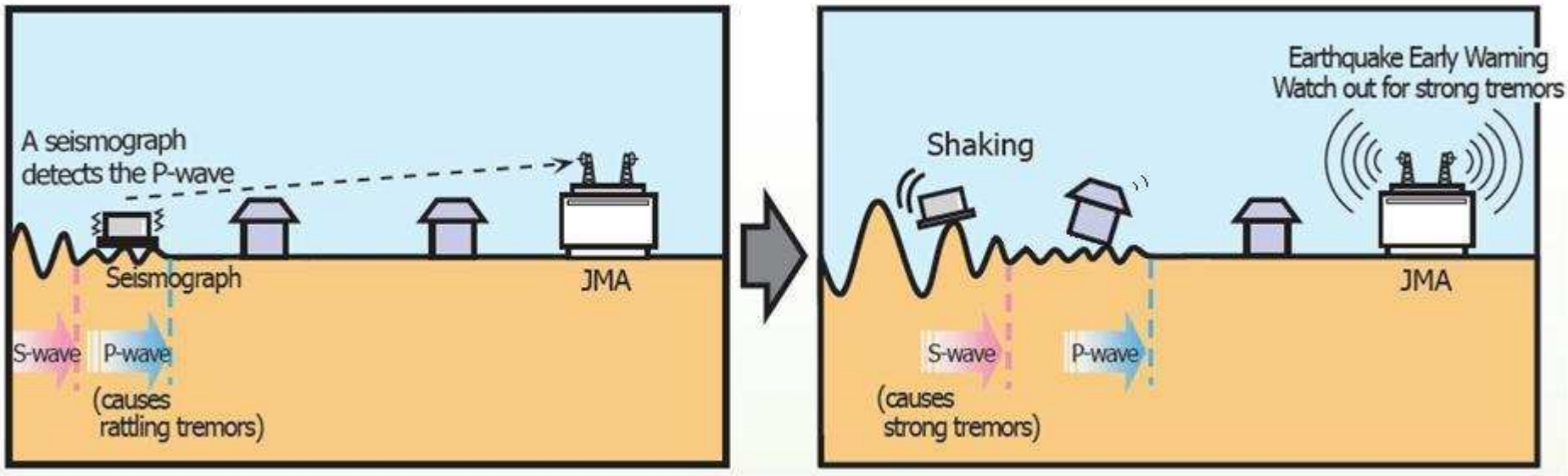
5 min.

Earthquake and Seismic Intensity Information
(Hypocenter and Magnitude with seismic intensity 3 or greater)

Information on Seismic Intensity at each site
(Hypocenter, Magnitude and Sites with seismic intensity 1 or greater)



Concept of Earthquake Early Warning (EEW) System



① **The EEW system automatically calculates an earthquake's focus and magnitude from P-waves detected near the epicenter, and then estimates the intensity of expected ground shaking (seismic intensity) at numerous locations in cities, towns and villages.**

② **An EEW message is provided a few seconds to a few tens of seconds before S-waves, or strong tremors, start.**

※These tremors may hit areas very close to the earthquake focus at the same time as EEW messages arrive, or even before.

Disaster Preparedness Information can be of real use

when

it reaches people in time.

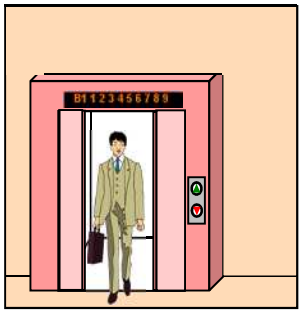
EEW message delivery

An earthquake occurs !

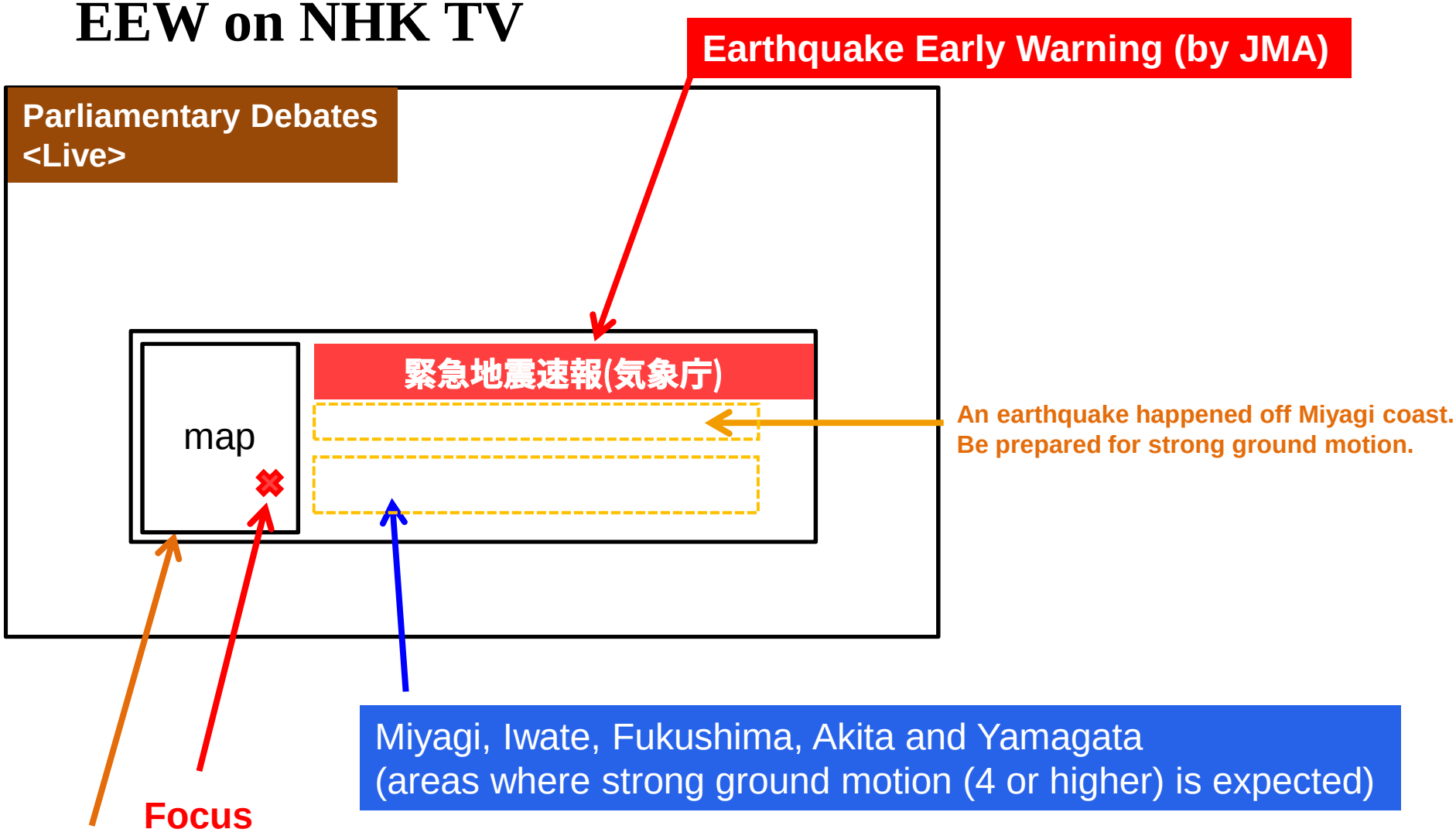
Via online channels with no human intervention

- TV, radio, local-government radio, cellular phone, EEW receivers (Provided by private companies), etc.

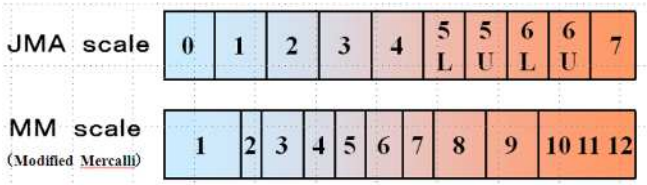
TV



EEW on NHK TV



Areas where strong ground motion (JMA Intensity Scale 4 or higher) is expected



Challenges addressed to deliver EEW message on TV

Examples of Challenges

- **Securement of EEW accuracy for broadcast without checking**

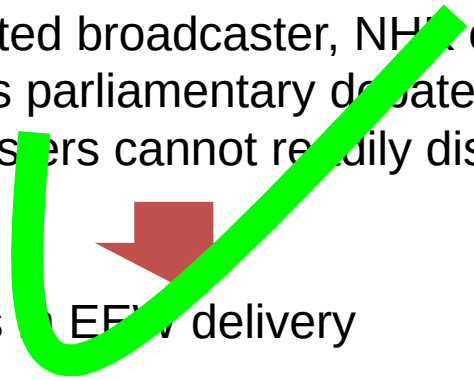
  TV companies basically have to check the content of broadcasts before transmission.

  Mission-critical delays in EEW delivery

- **Securement of advance approval for program interruption**

  - As the legally mandated broadcaster, NHK cannot readily interrupt programming such as parliamentary debates.
  - Commercial broadcasters cannot readily disturb programs without sponsors' permission.

  Mission-critical delays in EEW delivery



Disaster Preparedness Information
can be of real use
when it arrives in time

and

people know what to do in advance.

Earthquake Early Warning: Dos & Don'ts

Make residences earthquake-resistant and fix furniture to prepare for earthquakes

If you feel a tremor

Call the attention of those around you

Remain calm, and secure your personal safety!

If you see/hear an EEW

After seeing or hearing an Earthquake Early Warning, you have only a matter of seconds before strong tremors arrive. This means you need to act quickly to protect yourself.

At Home

- Protect your head and shelter under a table
- Don't rush outside
- Don't worry about turning off the gas in the kitchen

When Driving

- Don't slow down suddenly
- Turn on your hazard lights to alert other drivers, then slow down smoothly
- If you are still moving when you feel the earthquake, pull safely over to the left and stop

In Public Buildings

- Follow the attendant's instructions
- Don't rush to the exit

Outdoors

- Look out for collapsing concrete-block walls
- Be careful of falling signs and broken glass

On Buses or Trains

- Hold on tight to a strap or a handrail

In Elevators

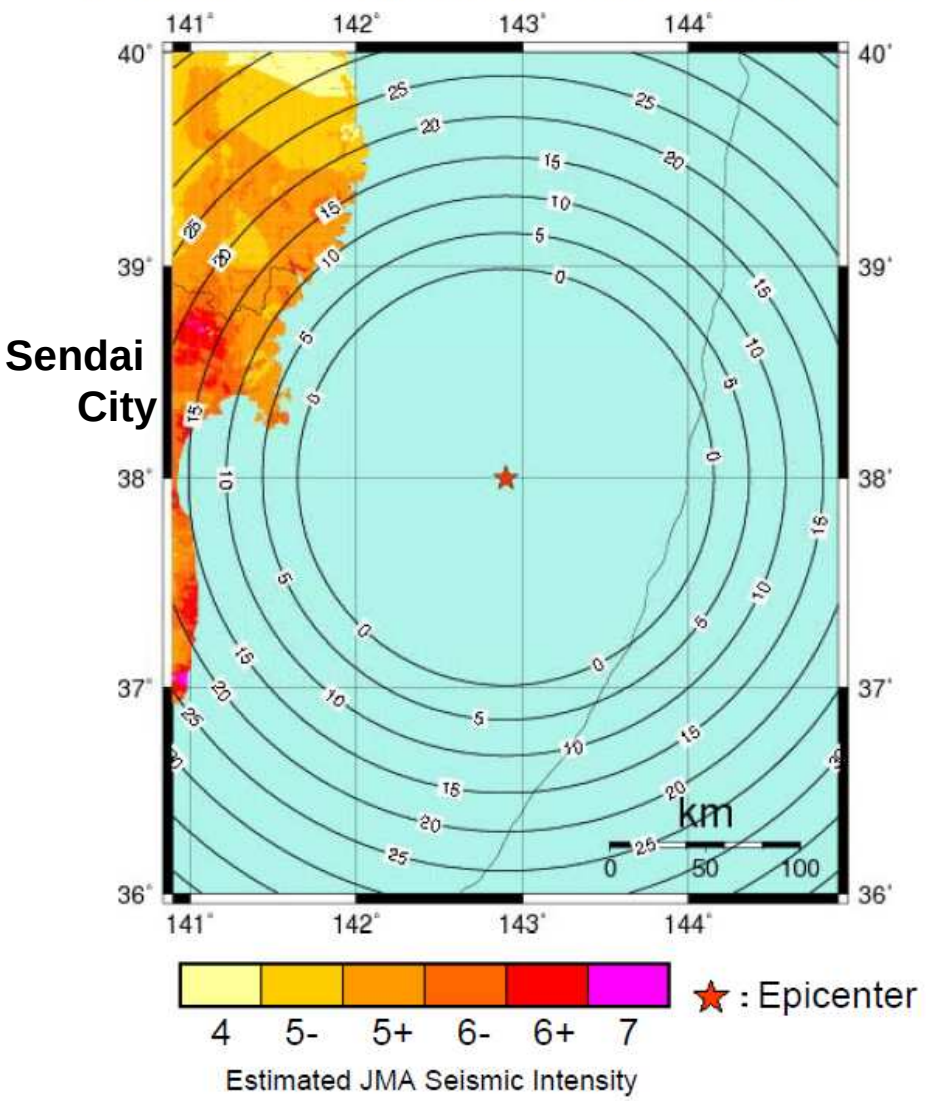
- Stop the elevator at the nearest floor and get off immediately

Public awareness by JMA leaflet

http://www.jma.go.jp/jma/en/Activities/EEWLeaflet.pdf

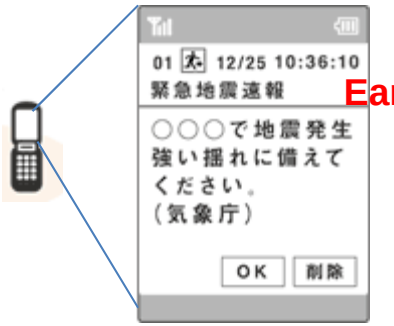
EEW on March 11, 2011

Time to arrival of S-wave (principal motion) after the issuance of EEW (sec)



- A EEW warning message reached to people in Sendai city area 15 to 20 seconds before strong ground motion started.

TV



Earthquake Early Warning

Be prepared for strong ground motion

Thank You