

“Japan disaster Mitigation and prevention
information XML format” (JMX)
is in operation!

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❑ **The 2011 off the Pacific coast of Tohoku Earthquake**

- ❑ On March 11, 2011 hit the northeast Japan
- ❑ Recorded Magnitude 9.0
- ❑ Tsunami height is 7m~23m (unconfirmed)
- ❑ Number of aftershock
 - over Magnitude 7.0 is 3 times,
 - over Magnitude 6.0 is 63 time,
 - over Magnitude 5.0 is 372 times (at 30 Mar 2011).
- ❑ 27,000+ people are reportedly dead or missing
- ❑ *This earthquake is strongest in Japan since recorded history.*
- ❑ **Deep condolences and sympathies to those affected by the quake**
- ❑ **Thank you for offers of assistance from across the world**

Background1–Natural disasters happened all the time in Japan

- ❑ **In Japan, natural disasters happened all the time.**
 - ❑ Number of earthquakes over Magnitude 6.0 in Japan accounted for 20.5% of the world.
 - ❑ Number of active volcano in Japan accounted for 7.0% of the world.
 - ❑ Number of typhoons making landfall on Japan is an average of 3 per year.
- ❑ **But there is a few disaster victims for huge amounts of natural disasters.**
 - ❑ The value of damages in Japan is 11.9% of the world.
 - ❑ The disaster victims in Japan is 0.3% of the world.
- ❑ **The government and other organizations in Japan have devised effective disaster prevention schemes.**

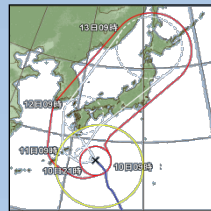
Background2 – Information for disaster prevention in Japan

□ In Japan, information for disaster prevention are

- Available for weather, earthquake, tsunami, volcanic accident and other natural disaster prevention; These information are issued by JMA only.
- Disseminated through JMA web site, mass media, press, and mobile text/web.
 - JMA web site is the only way that JMA can provide these information to the people directly.
 - Other ways are provided by mass media, content providers, and local governments.
- Used to help city and village mayors to issue evacuation instructions/recommendations.



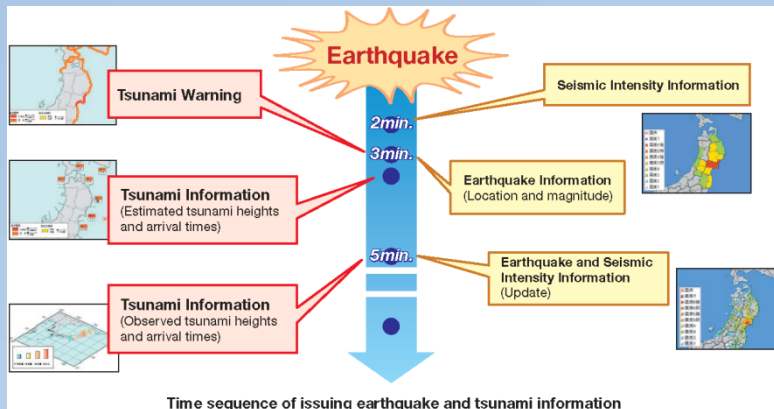
Weather Warning



Typhoon information



Volcanic Warning



Time sequence of issuing earthquake and tsunami information
Earthquake information and Tsunami warning



community
wireless
broadcast



PC



Video and data
broadcasting on TV

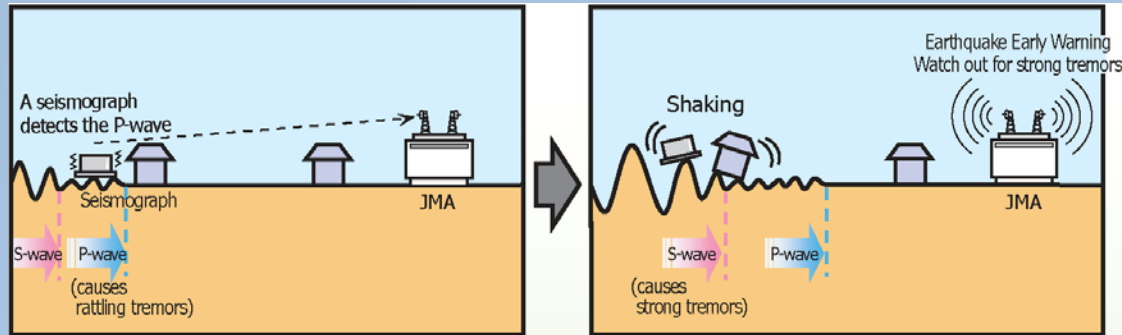


mobile

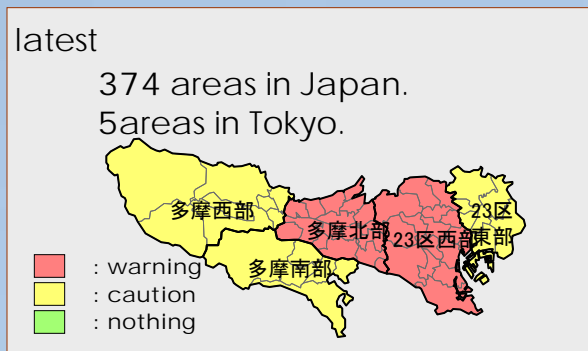
Background 3 - Latest activities and information systems in Japan

□ Improvement of services

□ Earthquake Early Warning System



□ Very detailed warnings for individual municipalities



□ Rapid progress in information and communication technology

□ New roles of various media and the use of their advantages

□ Project goals

- Profitableness to users:
 - adaptability to users' system and working.
 - cost-effective system in the long run
- Unified Format:
 - from various forms of conventional texts to a unified and comprehensive format.
- Consolidated description:
 - Multiple information in one single bulletin; from observations to forecasts
- Flexible format:
 - computer-processable form allowing new elements to be added for future services

□ Project collaborators



- Technical support from the XML Consortium on XML standardization
- Coordination with governmental organizations and the mass media

Already-operational CAP: Is CAP applicable to JMA's project?

❑ **Common points between JMA's project and CAP**

- ❑ Purpose: To distribute disaster prevention information
- ❑ Target: All natural hazards
(CAP also includes human-induced accidents)
- ❑ Content: User requirements for information;
target areas and quantities

❑ **Can/Cannot with CAP**

- ❑ The core information of JMA's warnings is expressible with CAP
 - ❑ Torrential rain
 - ❑ Flooding
 - ❑ Storm surges
 - ❑ Earthquakes
 - ❑ Volcanic eruptions
- ❑ Detailed observations and forecasts cannot be expressed with CAP
 - ❑ Quantitative estimates
 - ❑ Time-sequential values

Already-operational CAP: Is CAP applicable to JMA's project?

- ❑ **Difference between the international specification of CAP and the national level disaster response mechanism.**
 - ❑ CAP element "severity" does not mean the type of bulletins.
 - ❑ There is no agreement on the classification of information.
- ❑ **International and national guidelines in this matter should be prepared.**
- ❑ **CAP is not in operation in Japan at this time.**

“Japan disaster Mitigation and prevention information XML format” (JMX) is in operation!


- **“Japan disaster Mitigation and prevention information XML format”(JMX) is in operation! (but partially)**
 - JMX for weather warning has been in operation earlier since 27 May 2010.
 - JMX for other information was scheduled for 24 March 2011
=> postponed because of the 2011 off the Pacific coast of Tohoku Earthquake.

- **All bulletins of JMX will be in operation on 12 May 2011.**


About JMX - Part I

□ How JMX was developed:

- Data dictionary derived through close analysis of conventional bulletins.
- XML schema will be automatically generated from the data dictionary.

data dic. 

Line No.	Field Name	Type	Length	Unit	Remarks
330		*			
331	type.Weather	xs:string	500		
332		type	xs:string	50	1 分類
333		*			
334		*			"天気"
335		*			"基本天気"
336		refID	xs:unsignedByte		? 時系列での参照番号
337		condition	xs:string	50	? 状態
338		description	xs:string	500	? 文字列表現
339	type.WeatherCode	jmx_ebnullableinteger			
340		type	xs:string	50	1 分類
341		*			
342		*			"自動観測"
343		*			"気象予報用予日の"
344		refID	xs:unsignedByte		? 時系列での参照番号
345		condition	xs:string	50	? 状態
346		description	xs:string	100	? 文字列表現
347	type.Synopsis	xs:string	1000		
348		type	xs:string	50	1 分類
349		*			
350		*			"気象要因"
351	type.WaveHeight	jmx_ebnullablefloat			
352		type	xs:string	50	1 分類

XML schema  .XSD

```
</xs:simpleContent>↓
</xs:complexType>↓
<xs:complexType name="type.Synopsis">↓
  <xs:simpleContent>↓
    <xs:extension base="xs:string">↓
      <xs:attribute name="type" type="xs:string" use="required"/>↓
    </xs:extension>↓
  </xs:simpleContent>↓
</xs:complexType>↓
<xs:complexType name="type.WaveHeight">↓
  <xs:simpleContent>↓
    <xs:extension base="jmx_eb:nullablefloat">↓
      <xs:attribute name="type" type="xs:string" use="required"/>↓
      <xs:attribute name="unit" type="xs:string" use="optional"/>↓
      <xs:attribute name="refID" type="xs:unsignedByte" use="optional"/>↓
      <xs:attribute name="condition" type="xs:string" use="optional"/>↓
      <xs:attribute name="description" type="xs:string" use="optional"/>↓
    </xs:extension>↓
  </xs:simpleContent>↓
</xs:complexType>↓
<xs:complexType name="type.TideLevel">↓
```

□ JMX's three parts:

- "control" part communicative information
Bulletin title, Date of Issue, Status, Editorial Office ...
- "header" part common disaster prevention element
Warning or advisory kind, Target Time, Target Areas, Headlines, ...
- "body" part common and detailed element for characteristic of natural phenomena and disaster prevention.

- ❑ **Bulletins of JMX are available for:**
 - ❑ Observations of special phenomena (gust, phenological and so on)
 - ❑ Typhoon Information
 - ❑ Weather, Maritime, Tsunami and Volcanic Warnings
 - ❑ Earthquake Information and Earthquake Early Warnings (EEW)
 - ❑ And other information (weather, flooding, storm, climate, tide, etc)

Actual cases of JMX (1)

❑ The weather warning at the city level (operating).

- ❑ In past days, the weather warning was at partial prefecture level.
- ❑ Now available at city/town level.

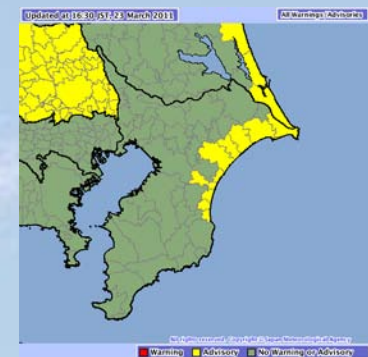
❑ Today's weather warning

- ❑ Targeting about 1800 cities and towns
- ❑ 23 Kinds of warnings and advisories (heavy rain, flooding, heavy snow, gust, high waves, storm surge, lightning, etc)
- ❑ quantitative and chronological estimate
 - ❑ Precipitation
 - ❑ Wind speed and locate
 - ❑ Wave height
 - ❑ Pressure
 - ❑ Temperature and humidity
 - ❑ Occurrence and valid time
 - ❑ etc

❑ Also expressed in figures and tables.

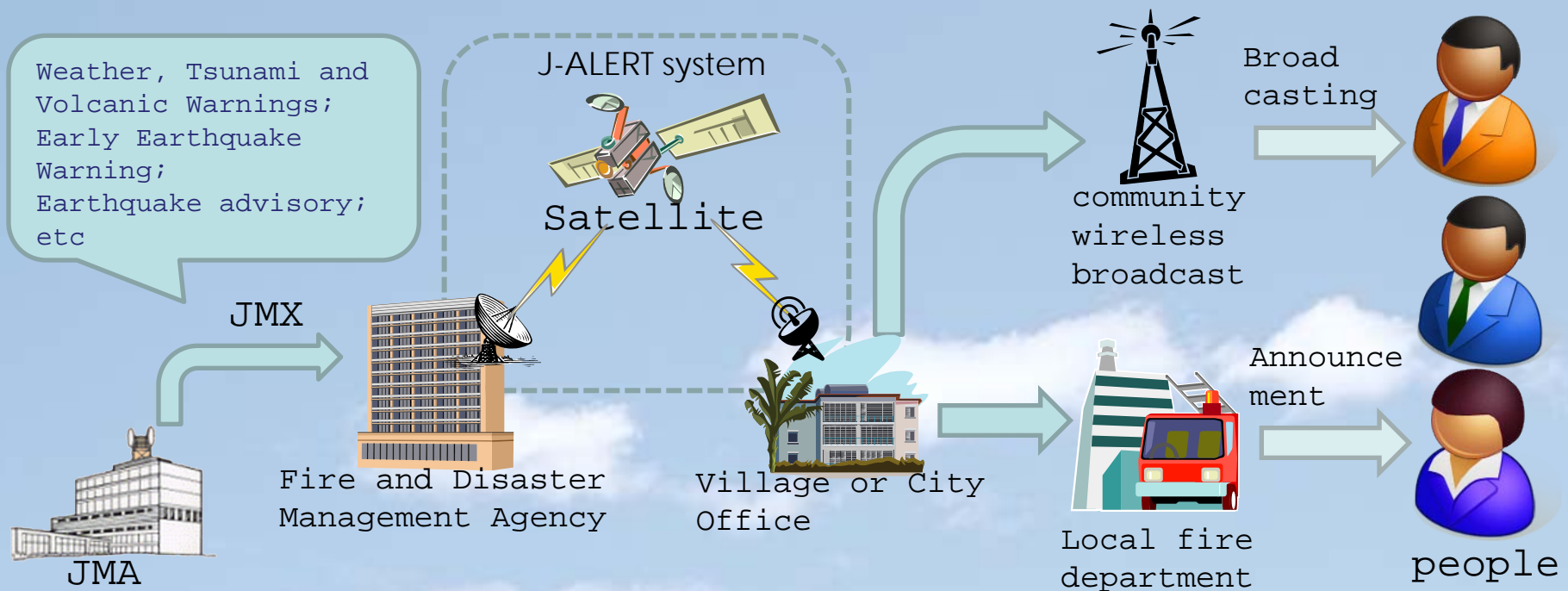
Updated at 11:22 JST, 23 March 2011 ■:Warnings ■:Advisories

Sub-prefecture region	Cities	Current Warnings and Advisories
	Sendai-shi Tobu	Storm surge Dry air Frost
	Shiogama-shi	Storm surge Dry air Frost
	Natori-shi	Storm surge Dry air Frost
	Tagajo-shi	Storm surge Dry air Frost
	Iwanuma-shi	Storm surge Dry air Frost



Actual cases of JMX (2)

- ❑ **JMX is disseminated to each city/town office through J-ALERT**
 - ❑ J-ALERT is a satellite communication system aiming at the protection of people.
 - ❑ J-ALERT delivers JMX and other information to all cities and towns.
 - ❑ Weather warning at municipal level enables the city/town to easily handle it.
 - ❑ J-ALERT system is operated by Fire and Disaster Management Agency.



□ JMX and CAP

- More detailed information for disaster prevention has been required in Japan.
- JMX: more detailed and specialized format for disaster prevention than CAP.
- JMX bulletins are easily re-formatted into CAP.
- JMA cannot decide to element values of "severity" or "certainty" in CAP, because of no agreement on the classification of information in Japan.

□ Discussions

- Needs for international ⇔ domestic information for disaster prevention are different.
- Interoperability (or compatibility?) will be important.

□ Plans in the future

- Adapting JMX to ISO/TC233 or OGC.
- Automated translation of JMX bulletins into foreign languages/voice announce, enabled with detailed elements of JMX.