

“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.**

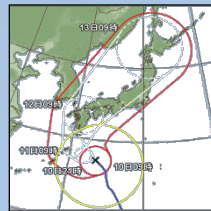
# Background2 – Information for disaster prevention in Japan

## □ 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.



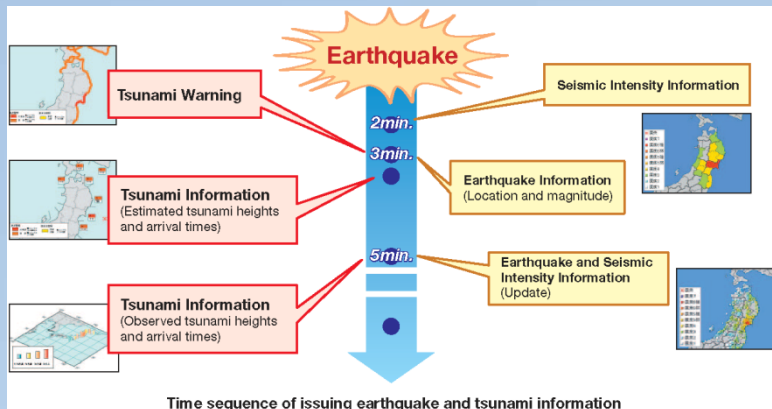
Weather Warning



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



### □ 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.

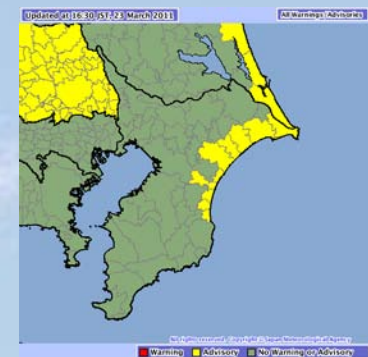
## ❑ Today's weather warning

- ❑ 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.

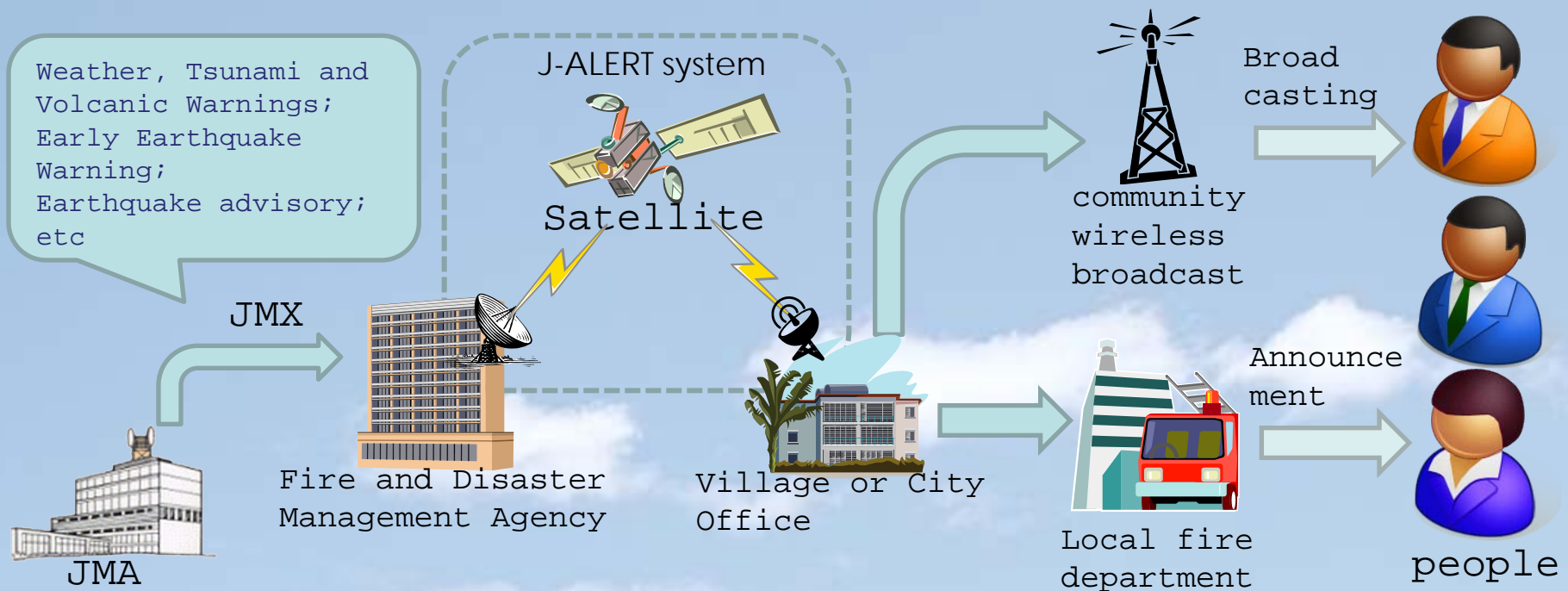
Updated at 11:22 JST, 23 March 2011 ■:Warnings ■:Advisories

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.