

Sixth Plenary Meeting of UN-GGIM-AP

Special Session on Geospatial Information for Disaster Response

-Case Study on 2016 Kumamoto Earthquake-

Session Introduction

4:00pm-4:05pm, 17th October 2017



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The modality of the Special Session (1)

- The core program of the 6th Plenary Meeting of UN-GGIM-AP, Kumamoto, Japan
- **Theme:** Actual and potential roles of National Geospatial Information Authorities (NGIAs) in Asia-Pacific towards promoting geospatial information for disaster risk management.
- **Objectives:** Sharing Asia-Pacific NGIAs' experience for disaster response and hence providing valuable inputs to the guidelines to be developed by UN-GGIM-AP WG2 on Disaster Risk Management.



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The modality of the Special Session (2)

- **Case Study Used:** Experiences of Geospatial Information Authority of Japan (GSI) in response to the 2016 Kumamoto Earthquake.
 - Case story document (provided in prior)
 - Presentations during the Session
- **Moderator:** Dr. Hiroshi Murakami (President of UN-GGIM-AP, Director-General of GSI)
- **Session Structure:** Five parts, on PM 17 Oct. and AM 18 Oct.. Each part has presentation sections(s) by GSI and discussion section(s)



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Time and issue table of the Special Session

Parts	Part 1 4:00pm- 4:45pm 17 Oct.	Part 2 4:45pm- 5:30pm 17 Oct.	Part 3 9:15am- 10:15am 18 Oct.	Part 4 10:45am- 11:45am 18 Oct.	Part 5 0:00pm- 0:45pm 18 Oct.
Theme	Background	Outset of the 2016 Kumamoto Earthquake	Emergency Disaster Response Activities	Activities for Recovery and Reconstruction	Overall Management
Time-series	Before the Earthquake	14 April 2016 16 April 2016	16 April 2016 30 April 2016	1 May 2016 17 Oct. 2017	The whole period
Issues	*Japanese Geography *Legal Framework *GSI's role in the Govt.	*Geography *The First Shock *Initial Response *The Second Shock	*Responses after the Mainshock *Meeting the Needs of Stakeholders *Responding to Changing Needs	*Geospatial Information for Recovery and Reconstruction	*Managing Disaster Responses *Conclusion



The modality of the Special Session (3)

- Participants are expected to engage in discussions on:
 - How to prepare for and response to disasters
 - How to align with stakeholders
 - What kind of geospatial information to be developed and how would it be provided
- Your active participation is the key for the success of the Special Session
- So, sharing of your experiences, opinions, and insight is much appreciated !



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Special Session on Geospatial Information for Disaster Response

-Case Study on 2016 Kumamoto Earthquake-

Part 1: Background

4:05pm-4:45pm, 17th October 2017



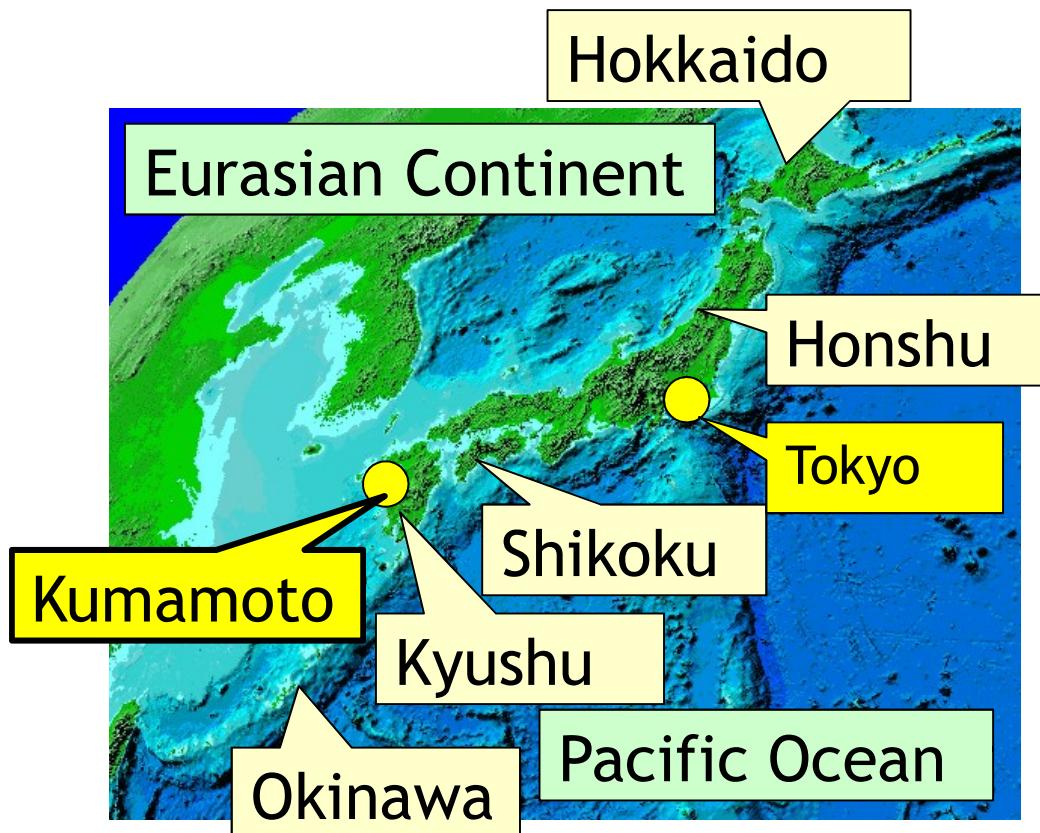
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Japan's geography



- An archipelago, on the north-western rim of Pacific Ocean
- Five main islands
- Latitude 20-45N
- Longitude 120-153E
- Area: 370,000 sq. km
- Population: 125 million
- Climate: temperate wet monsoon zone, with 1,700 - 1,800 mm rainfall a year

Map Ref. http://www.gsi.go.jp/kanshi/crstanime9604_9912b.html



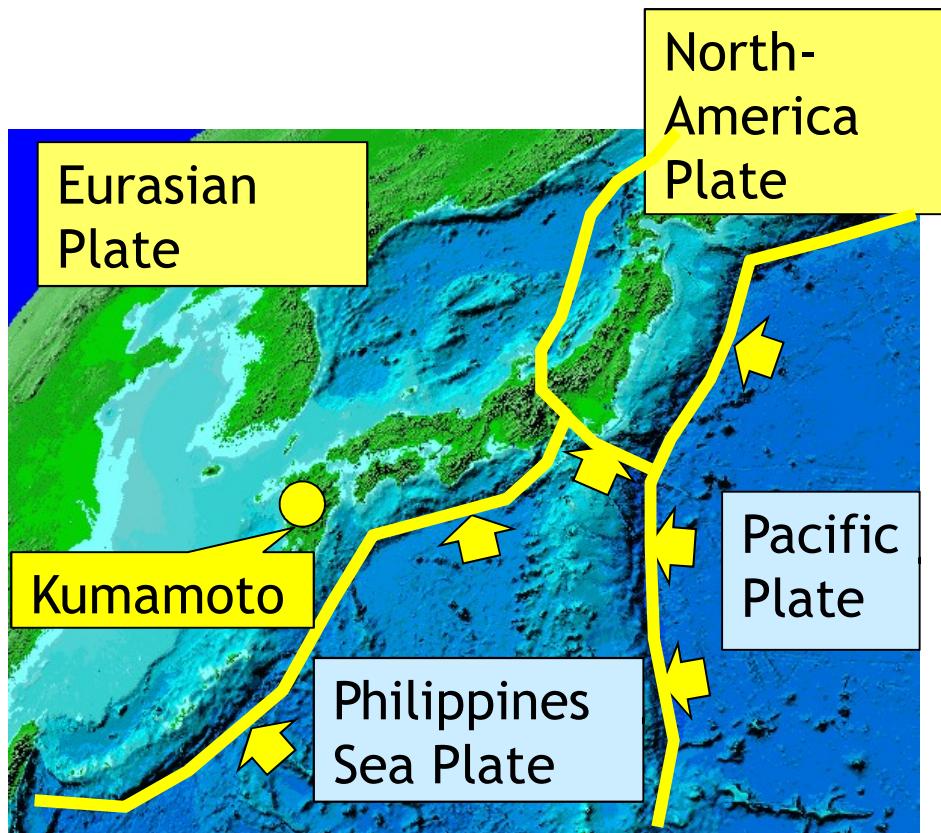
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Japan's tectonic setting



- Two Ocean Plates
 - Pacific Plate
 - Philippines Sea Plane
- Two Continental Plates
 - Eurasia Plate
 - North-America Plate
- In convergence zones
 - Earthquakes
 - Volcanoes
- A part of the circum-pacific “Ring of Fire”

Map Ref. http://www.gsi.go.jp/kanshi/crstanime9604_9912b.html



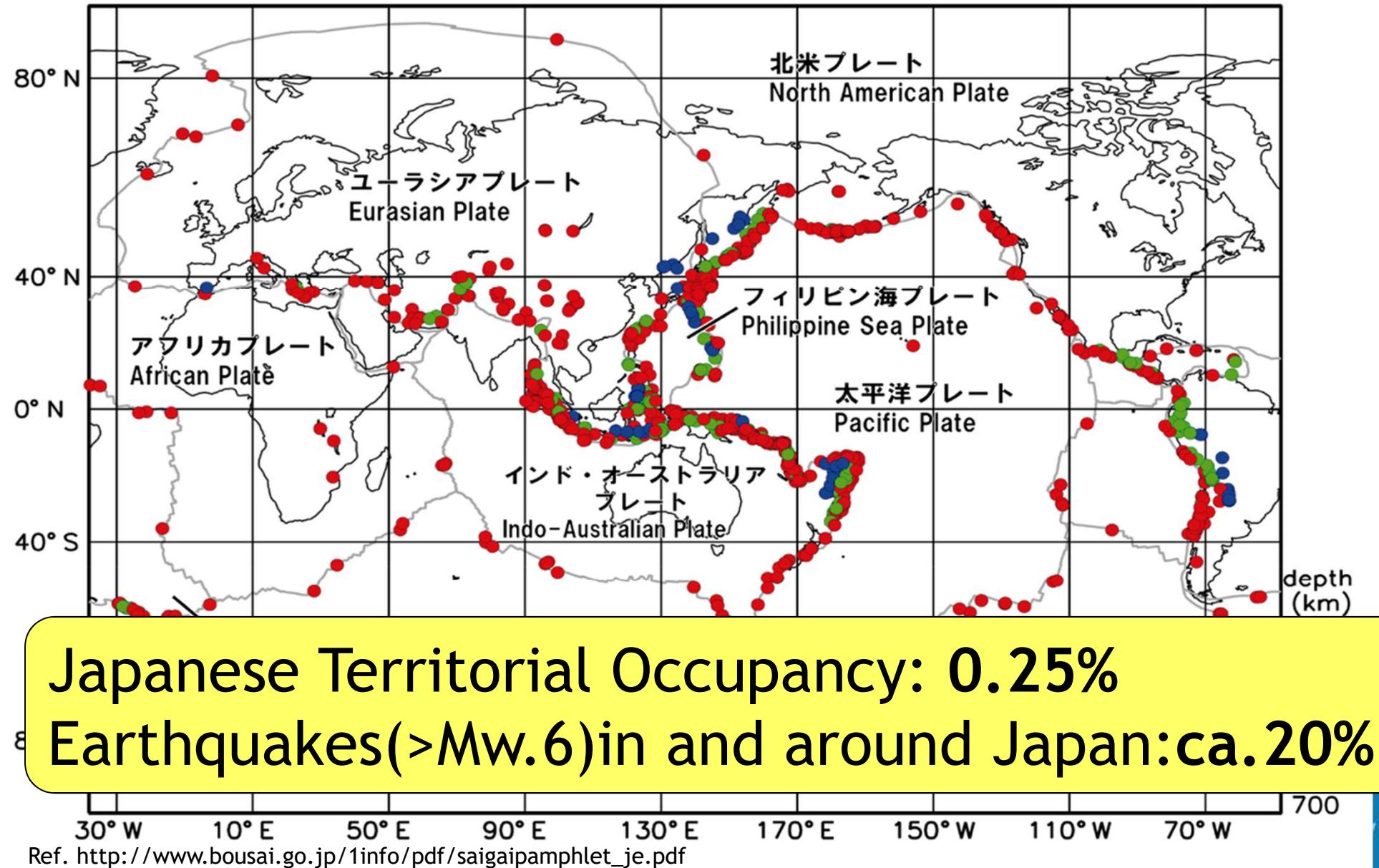
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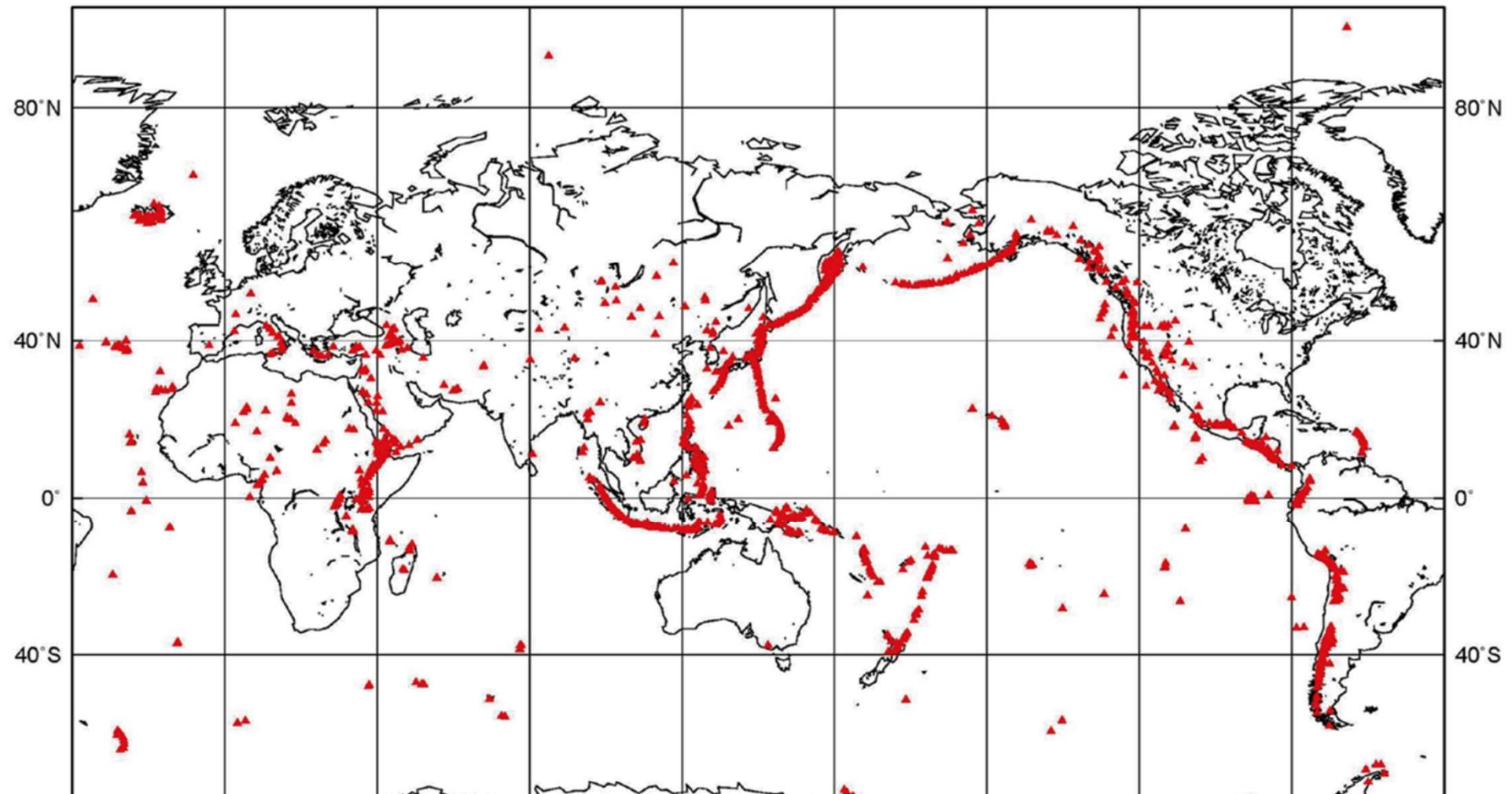
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Analysis of magnitude 5.0 and greater earthquakes' epicenters from 2004 to 2013

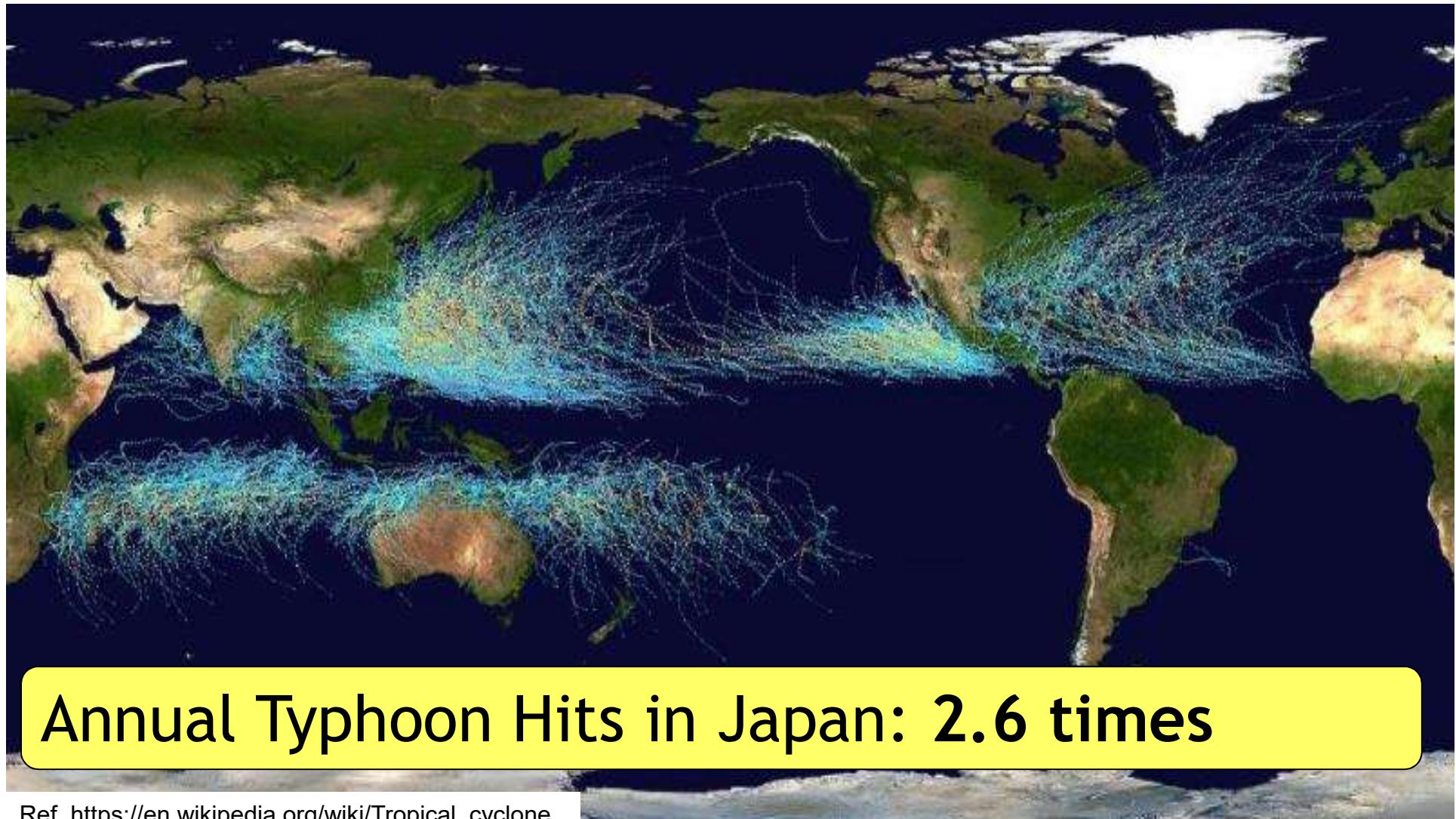


Global distribution of volcanoes



Numbers of World Volcano: ca. 1,500
Active Volcanoes in Japan: 111 (7% of share)

Tropical cyclone tracks between 1985 and 2005



Annual Typhoon Hits in Japan: 2.6 times

Ref. https://en.wikipedia.org/wiki/Tropical_cyclone



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Ref. xxxx

So many disasters hit Asia-Pacific region including Japan

- Earthquakes
- Tsunamis
- Typhoons
- Landslides
- Floods
- Volcanic Eruptions
- Storm Surges
- Forest Fires etc.



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Legal framework

- The Basic Act on Disaster Control Measures (1961)
- It stipulates:
 - Disaster Prevention Schemes
 - Disaster Prevention Planning
 - Measures necessary for
 - Disaster preparedness
 - Emergency disaster response
 - Recovery and Reconstruction
 - Role of national and local governments
- **GSI is one of the 24 Designated Government Organizations (DGOs) under the Act.**



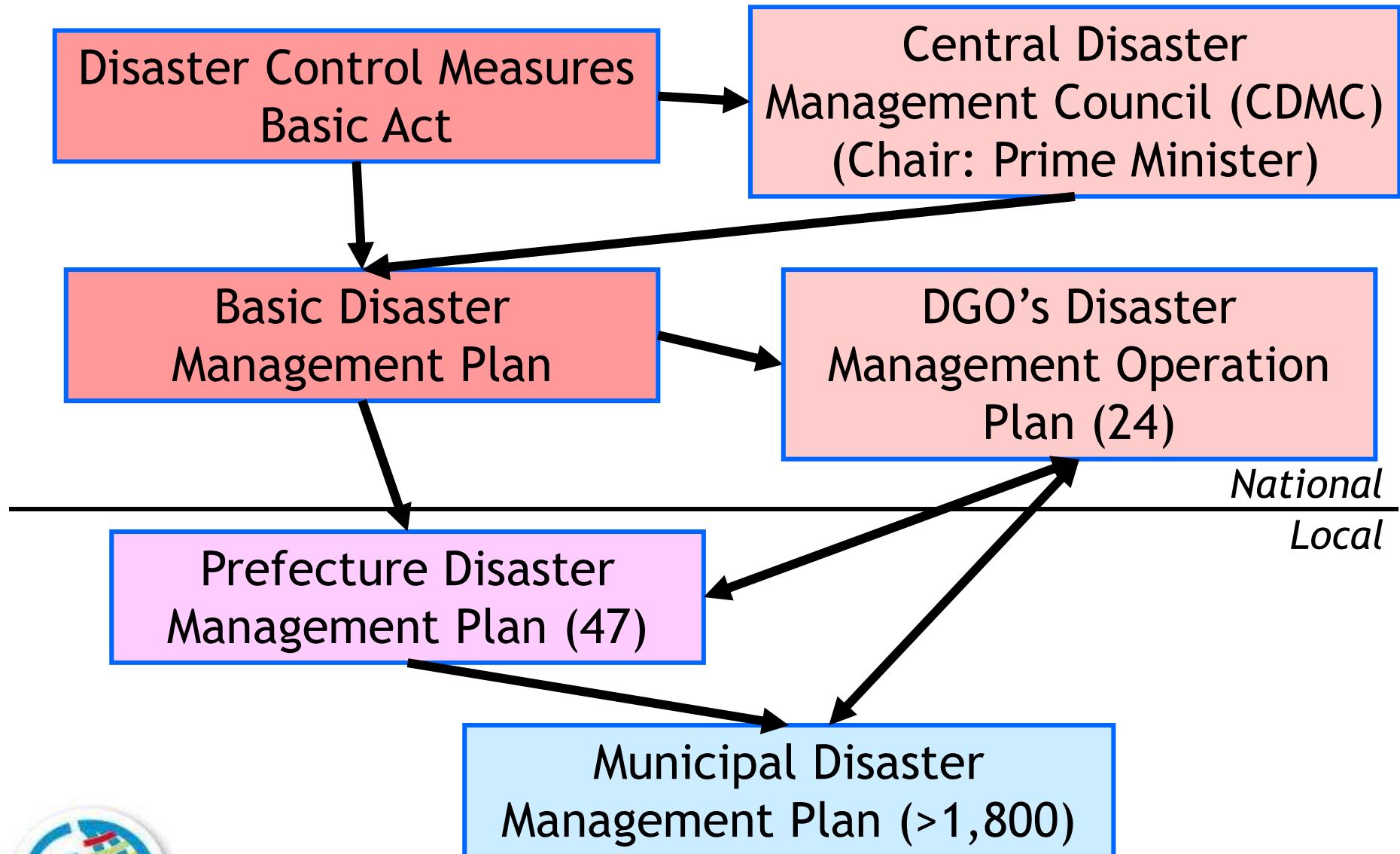
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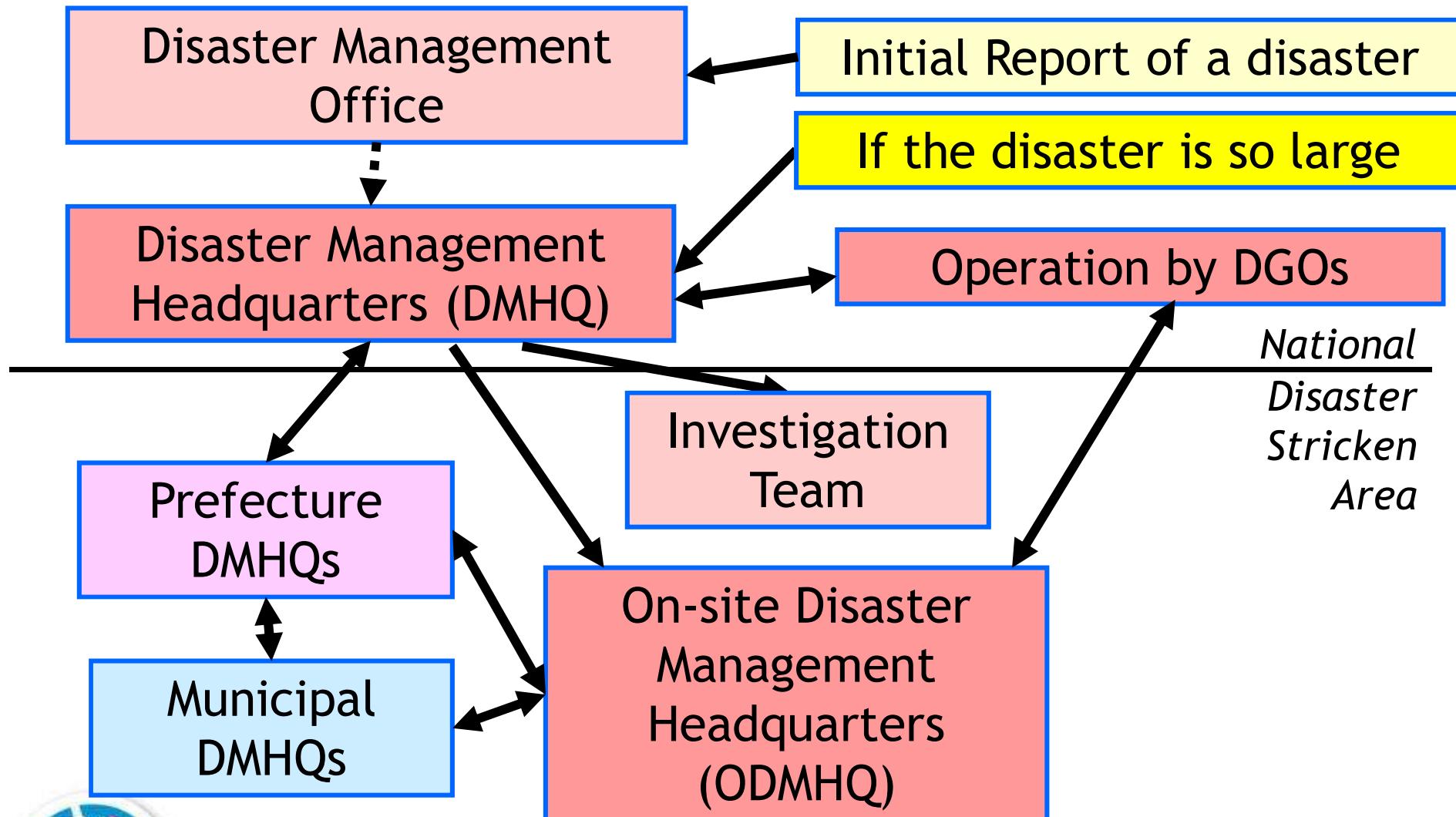
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Hierarchy of disaster management planning



When a large disaster occurs



Three helps for disaster resiliency

- **Self-help**
 - Protect lives by themselves
- **Mutual-help**
 - Protect lives by communal cooperation
- **Public-help**
 - Protect lives by public agency (i.e. police, firefighters etc.), a limited capacity at a large disaster



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Importance of mutual-help

- People's consciousness changed after Great East Japan Earthquake in 2011
- Disaster drills at schools, workplace and communities
- Storing emergency goods (foods, flashlights etc.)
- Volunteered “disaster prevention corps”, with 860,000 members



Ref.https://www.city.tsukuba.ibaraki.jp/dbp_s_data/_material_/localhost/2013-01-07.pdf



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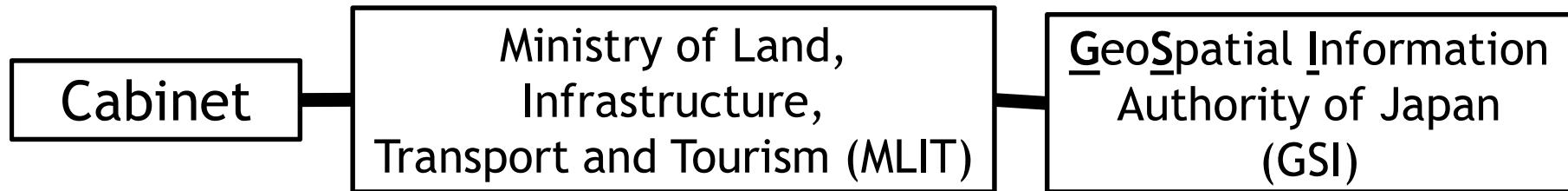
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Geospatial Information Authority of Japan (GSI)

- A Government Organization



- History

1869: Cadastral Map Section, Ministry of Civil Service
1888: Japanese Imperial Land Survey, General Staff Office
1945: GSI, Ministry of Home Affairs
1948: GSI, Ministry of Construction
2001: GSI, MLIT

- Functions

(+) National geodesy & mapping, Disaster Risk Management, SDI policy & promotion
(-) Cadastral, land & real estate mgmt., hydrography

GSI HQ in Tsukuba



Where are GSI functions?



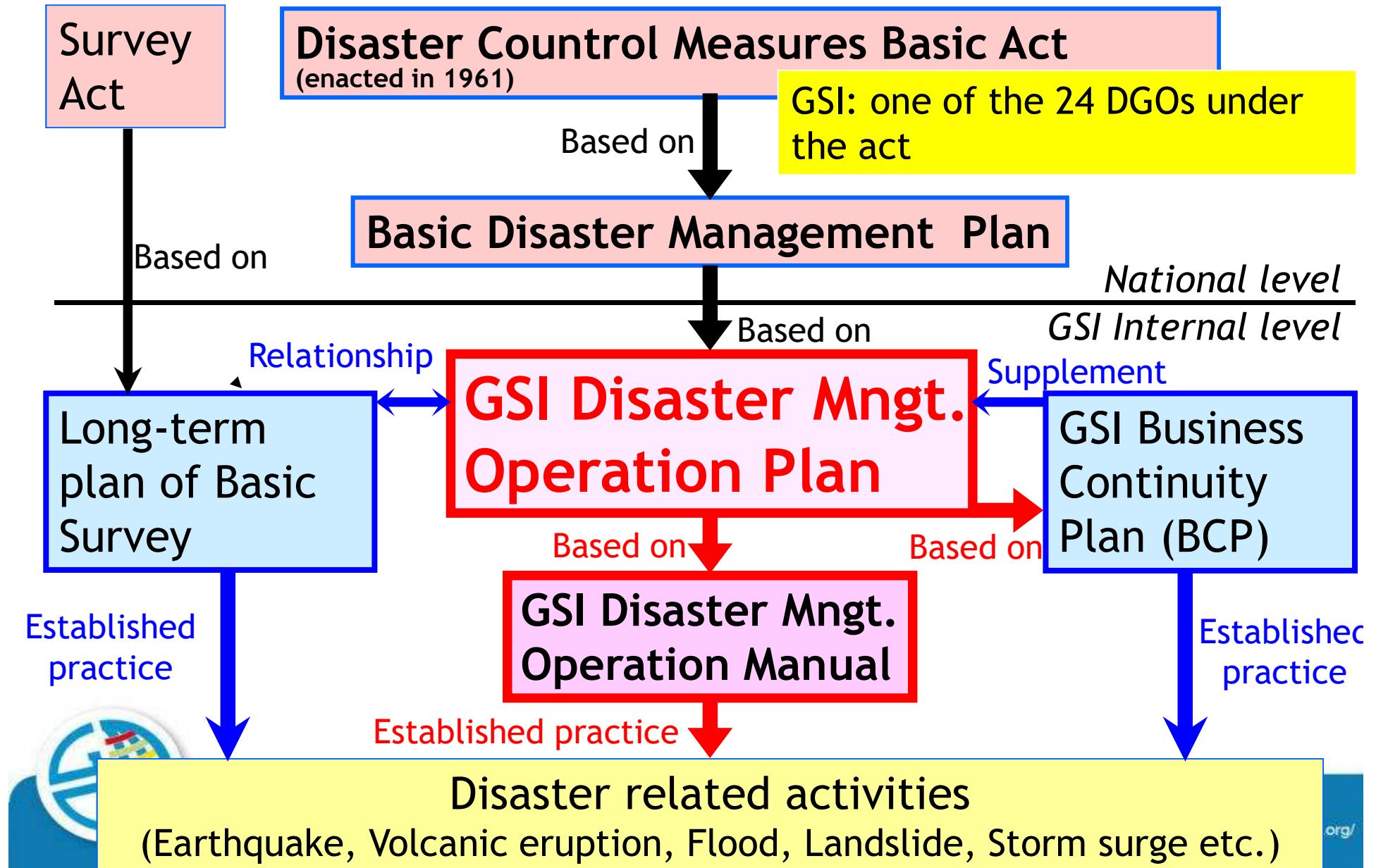
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How GSI responses to disasters



Preparation measures for disasters (1)

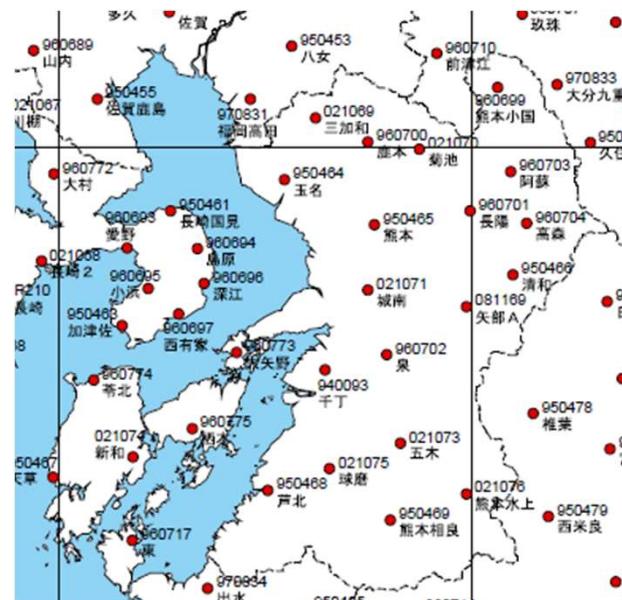
Maintain Geodetic Infrastructure Healthy and Ready

CORS Network (GEONET)

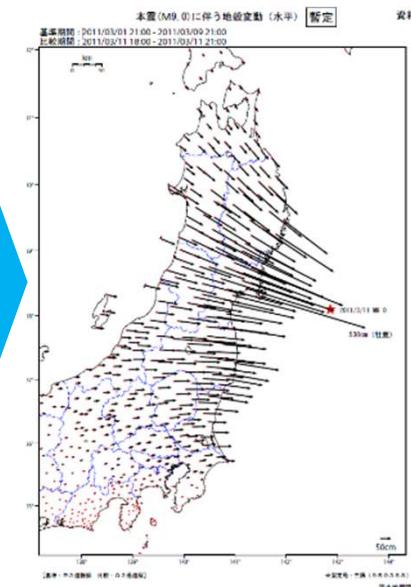


Check and Maintain
Physical Structure
Auxiliary Battery
Communication System
GNSS Receiver etc.

24 CORSs in Kumamoto
Prefecture



Quick acquisition of
crustal movements by
an earthquake



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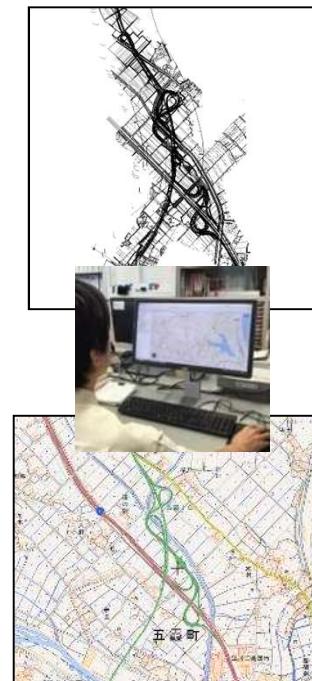
Preparation measures for disasters (2)

Keep Digital Japan Basic Map always updated

Mapping by
photogrammetry

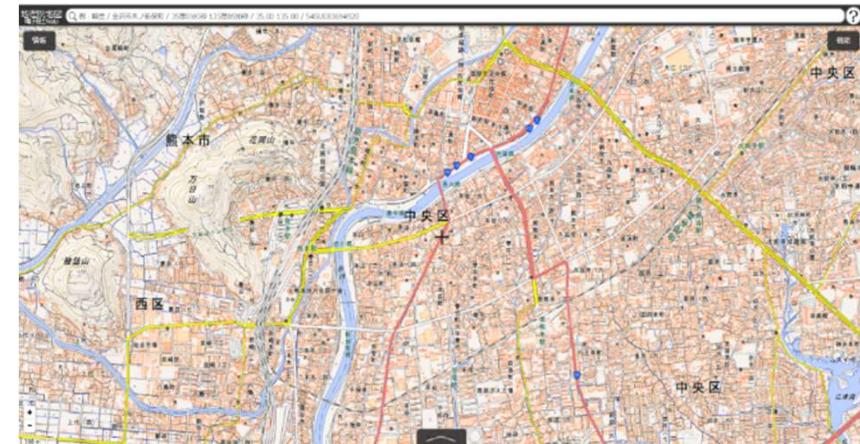


Spot Mapping for
Infrastructure
Update



Keep Basic Map
Always Fresh

- Get common operational pictures
- Make right decision during disaster response



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Preparation measures for disasters (3)

Provision of disaster risk related geospatial information

Active Faults



Volcanic Landform



Shaded Elevation



Lowland Landform



Evacuation Places



Hazard Map Portal



Thematic Info. for local governments and residents



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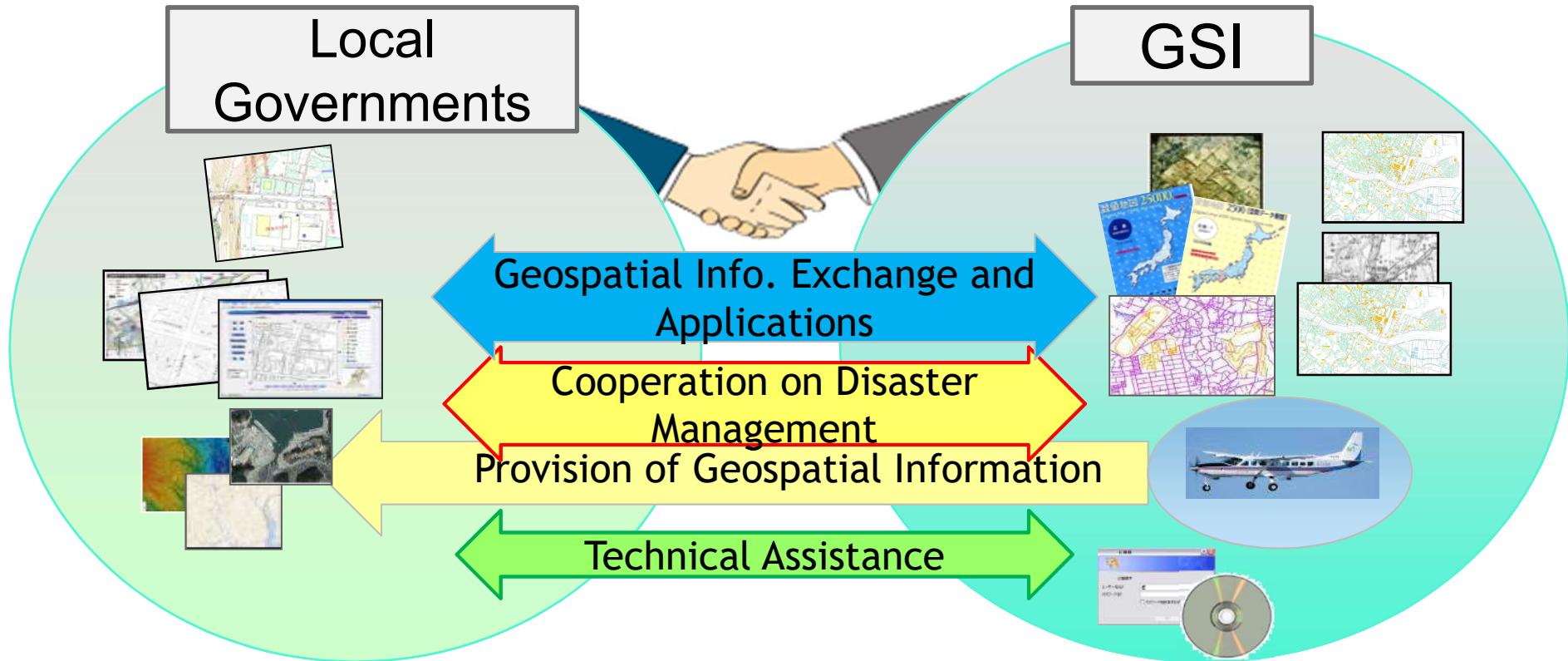
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Preparation measures for disasters (4)

Partnership agreement with local governments etc.



- Kumamoto Prefecture (2015-)
- Kumamoto City(2014-)
- Kyushu Regional Dev. Bureau/ MLIT (2011-)

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Preparation measures for disasters (5)

Disaster drills at government-wide and GSI-alone

Government Tsunami
Response Drill



UAV Pilotage Drill in GSI



Demonstration GSI
Survey Aircraft



DMHQ Operation Drill in GSI



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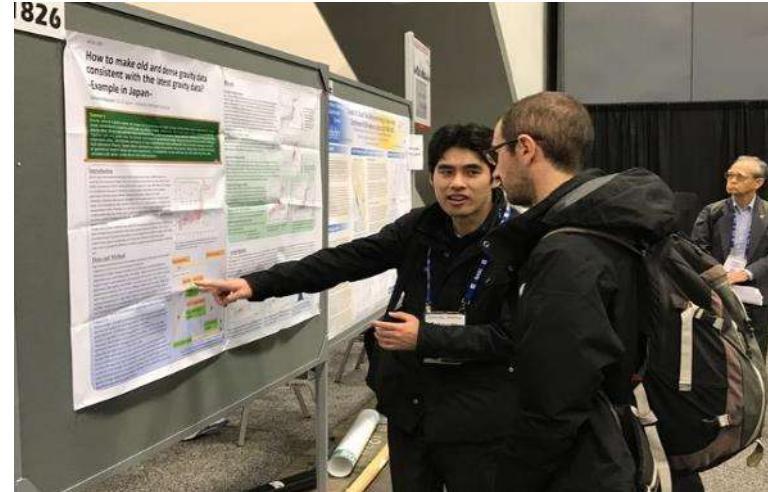
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Preparation measures for disasters (6)

Public relations activities



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Preparation measures for disasters (7)

Securing air-photo taking capability

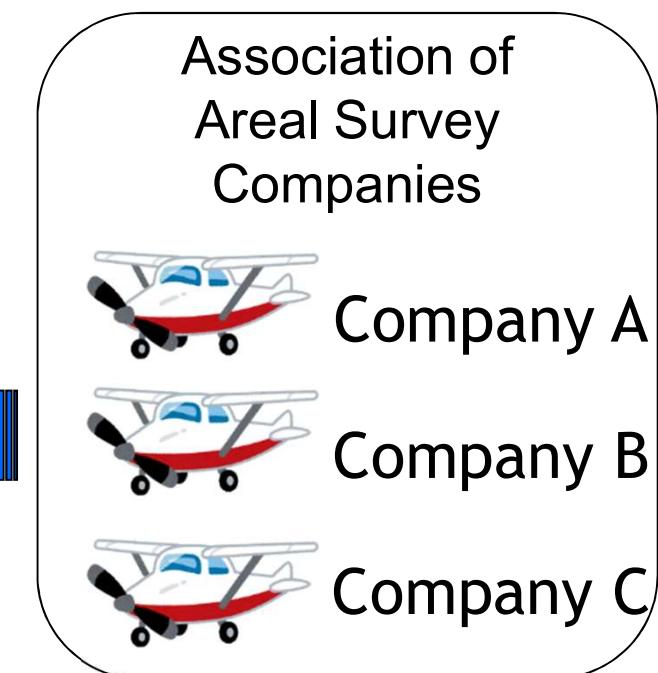
- GSI owns one survey aircraft, sufficient for a small disaster
- Just one air craft can not cover the whole affected areas of a large disaster (e.g. 2011 Great East Japan Earthquake)



Preparation measures for disasters (7)

Securing air-photo taking capability

- To solve this, GSI made a partnership agreement with the association of areal survey companies for emergency photography

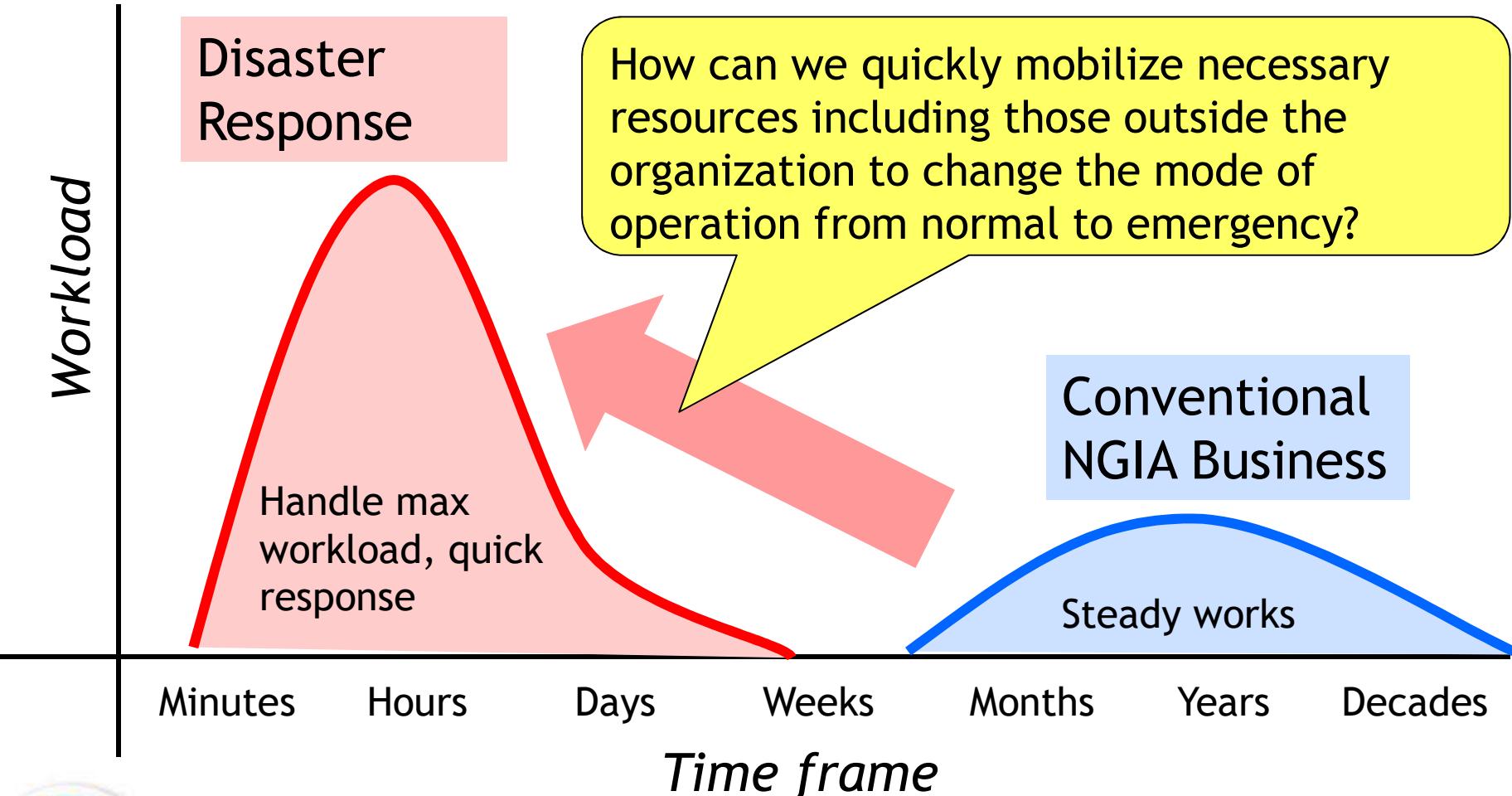


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Sudden surge of demand

poses a challenge: changing time-Management paradigm



Topics for discussion #1

- What kind of domestic legal bases are in your country to mandate NGIAs to take action for disaster risk management?
- What kind of preparation measures should NGIAs take before the occurrence of a disaster?
 - in order to allow the government and people to get well prepared for future disaster; and
 - to meet sudden surge of demand for up-to-date geospatial information of the stricken areas



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You are now in Kumamoto
The time is supposed to be
9:25pm, 14 April 2016 (Thursday)
-Just before the first shock-



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