

The 1st JSCE-ASCE Symposium on
Infrastructure Resilience
May 23, 2019 @ Auditorium-JSCE, Tokyo

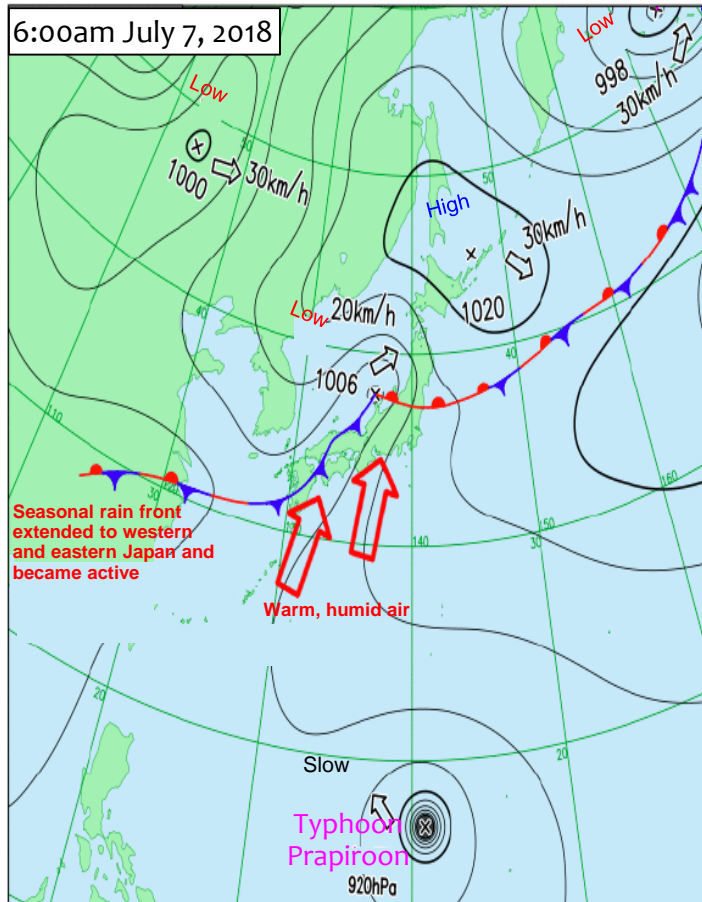
Government Actions for Mega Disasters

- Review of 2018 July West Japan Heavy Downpour -

Toshio OKAZUMI, Ph.D.

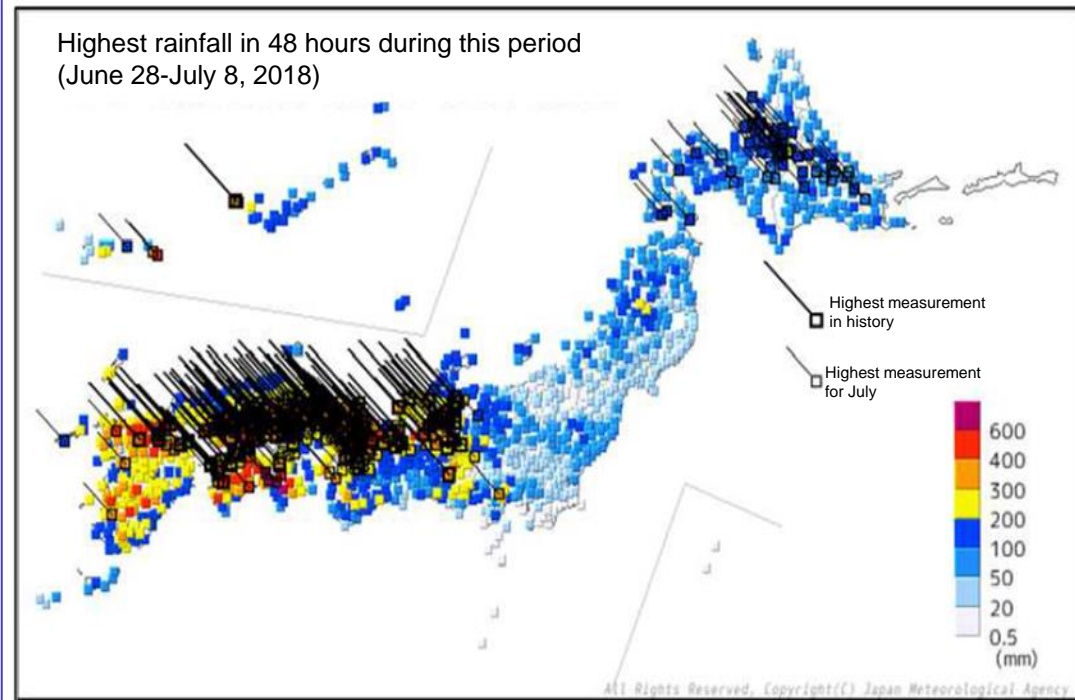
Assistant Vice-Minister for International Affairs (Engineering)
/Deputy Director-General for Engineering Affairs in Policy Bureau
& Construction Industries Bureau,
Ministry of Land, Infrastructure, Transport and Tourism - Japan

Seasonal rain front remained and
typhoon created humid air



Actual weather map (6:00am July 7, 2018)

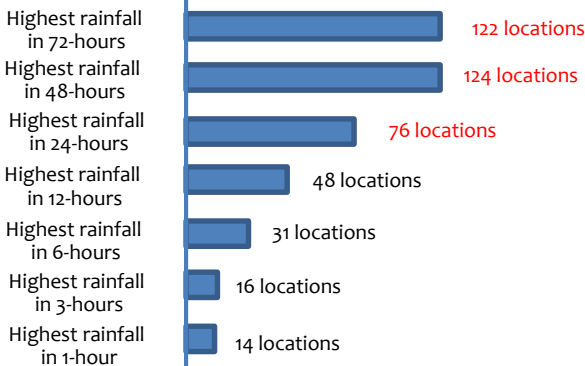
Record levels of heavy rainfall across a wide area



Highest rainfall in 48 hours during this period (June 28-July 8, 2018)

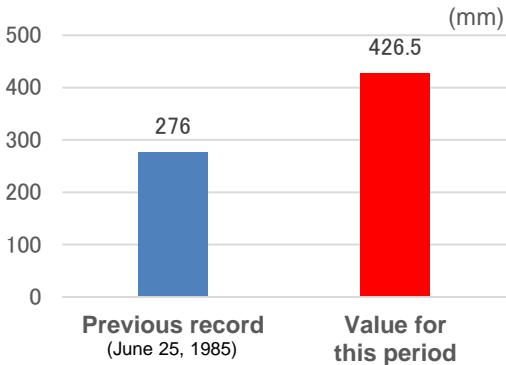
Heavy rainfall over the planned in many area

Heavy rain over an extended period



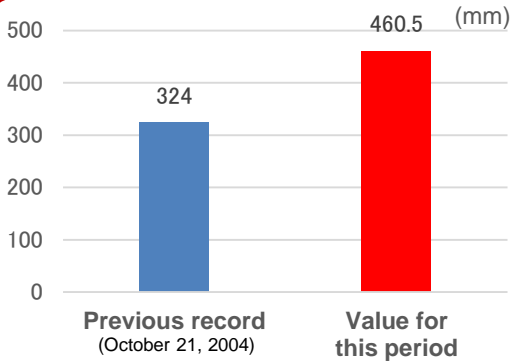
Locations with record rainfall (by period)

Higashi-Hiroshima City (Hiroshima Prefecture)



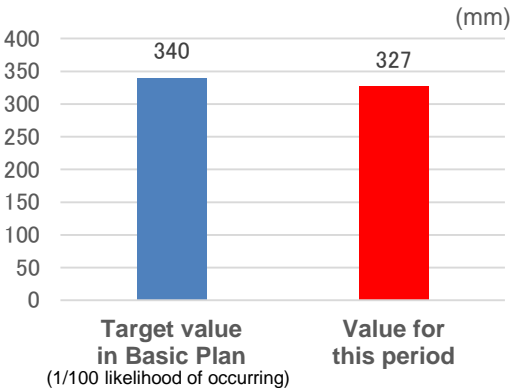
*In a 48-hour period at the Shiwa Meteorological Station

Takayama City (Gifu Prefecture)



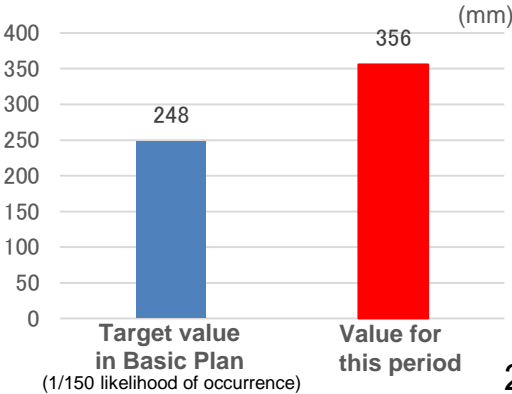
*In a 48-hour period at the Mumaya Meteorological Station, Takayama City

Hiji River (Ehime Prefecture)

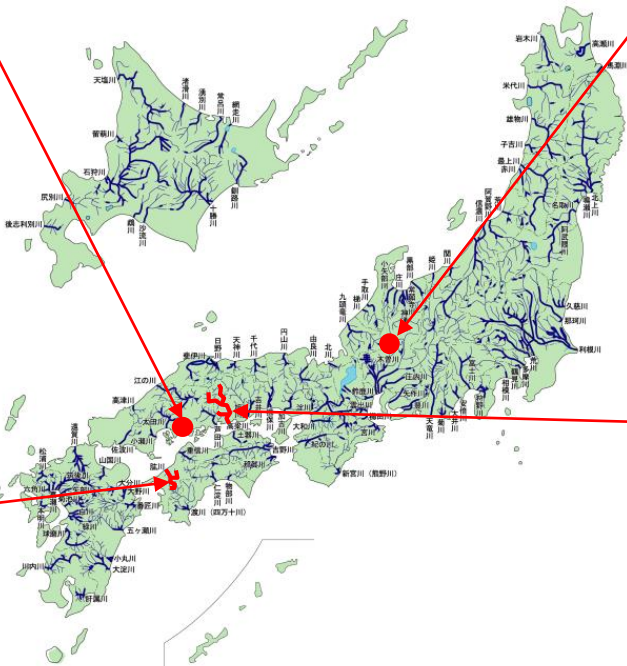


*Average rainfall in upper catchment area in Ozu in a 2-day period

Takahashi River (Okayama Prefecture)



*The target value in the Basic Plan is the average rainfall in the upper catchment area in Funao (Kurashiki City) in a 2-day period. The value for this period is the average rainfall throughout the catchment area in a 2-day period.



DAMAGE (as of Nov 6, 2018)

Casualties: 224

Missing: 8

Injuries: 459

Damaged houses:

6,758(full), 10,878(half), 3,917(partial)

Submerged houses: 8,567(full), 21,913(half)



Mabi, Kurashiki City, Okayama Pref.



Fukuoka Pref.



Kyoto Pref.



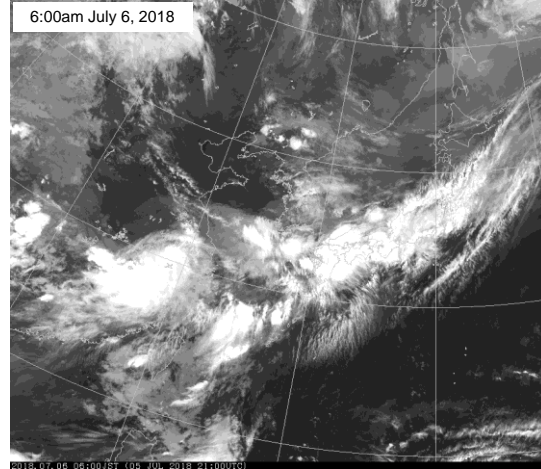
Hiroshima Pref.



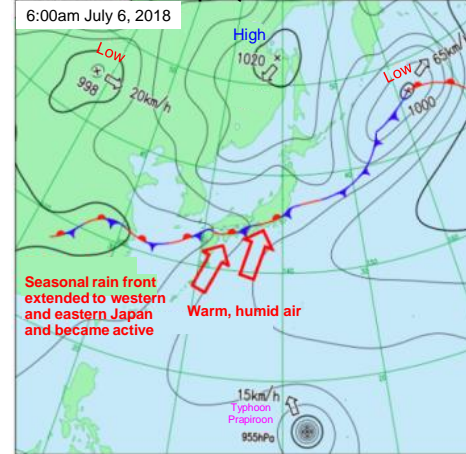
Mabi, Kurashiki City, Okayama Pref.³

Most serious flooded area, Chugoku region

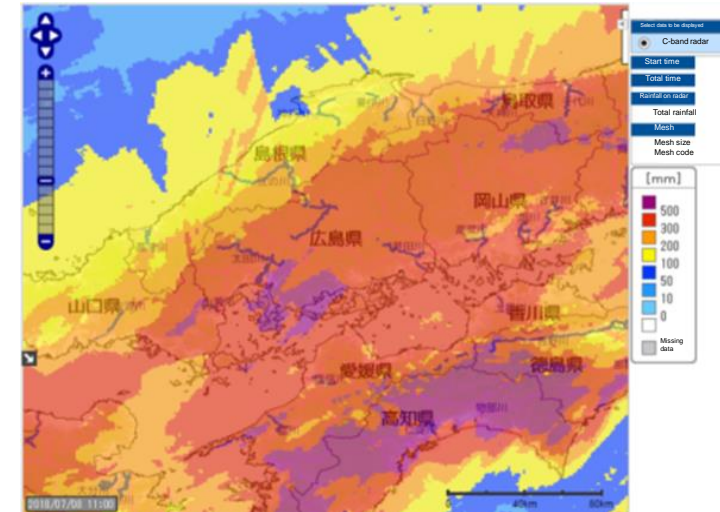
■ Satellite image (from JMA website)



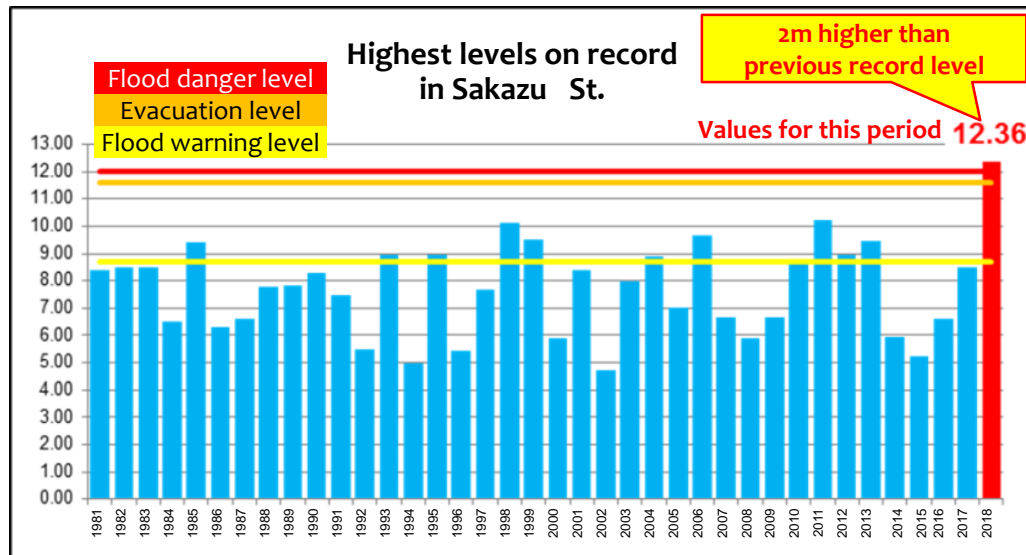
■ Weather map (from JMA website)



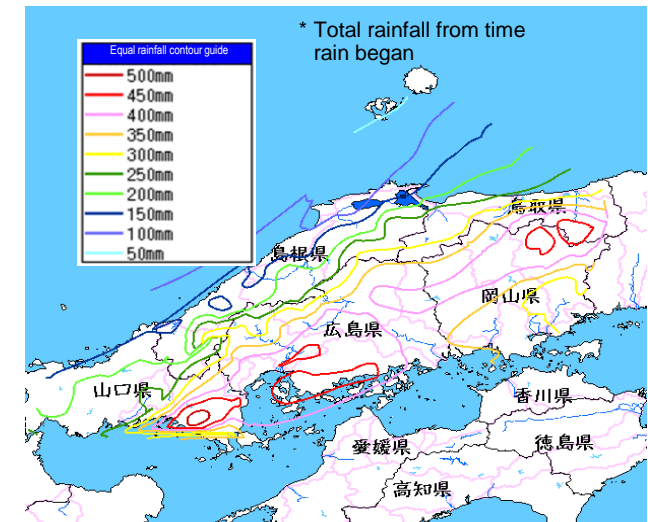
■ Total rainfall map (C-band radar) (by MLIT)



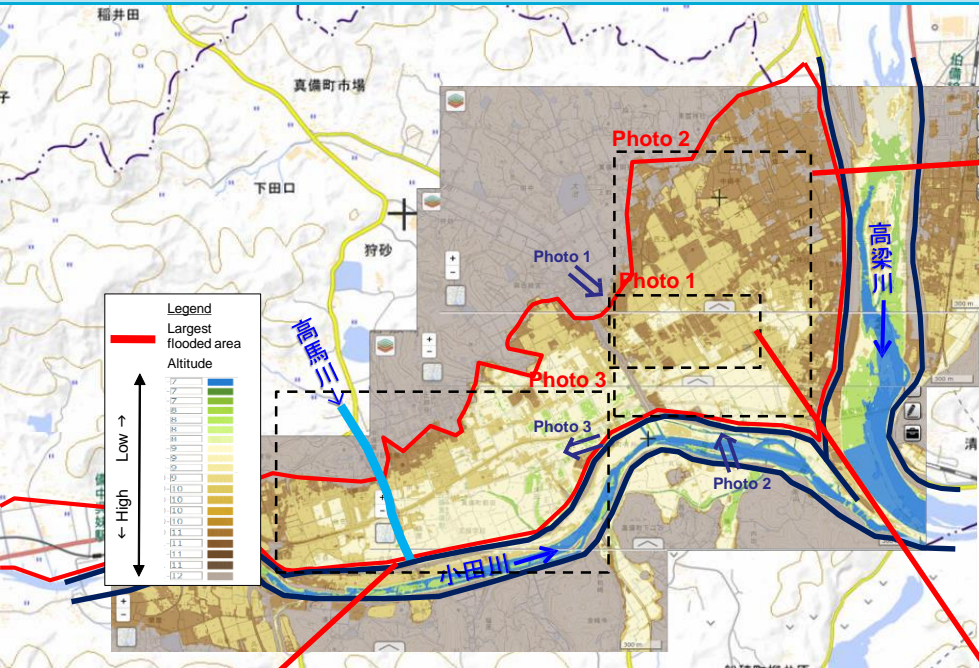
■ Measurements for Sakazu Water Level Measurement Station (Takahashi River), where record levels were measured



■ Equal rain contours (by MLIT)



Most serious flooded areas, Kurashiki-City



Most serious flooded areas, Kurashiki-City



Photo by T.Okazumi

○ Main jurisdictions that experienced damage* (1,000 or more damaged buildings)

Prefecture	City	Damage		
		Buildings: above ground	Buildings: below ground	Total
Okayama	Okayama	1,687	3,728	5,415
Fukuoka	Kurume	423	1,011	1,434
Hiroshima	Fukuoka	751	638	1,389
Total (for 88 regional jurisdictions)		6,254	13,557	19,811

Kyoto Prefecture	Fukuchiyama City
	Maizuru City
	Miyazu City
	Yosano Town

Hiroshima Prefecture	Fukuyama City
	Kure City
	Higashi- Hiroshima City
	Saka Town
	Fuchu City
	Takehara City

Okayama Prefecture	Okayama City
	Kurashiki City
	Kasaoka City
	Soja City
	Takahashi City
	Ibara City

Yamaguchi Prefecture	Hikari City
	Iwakuni City

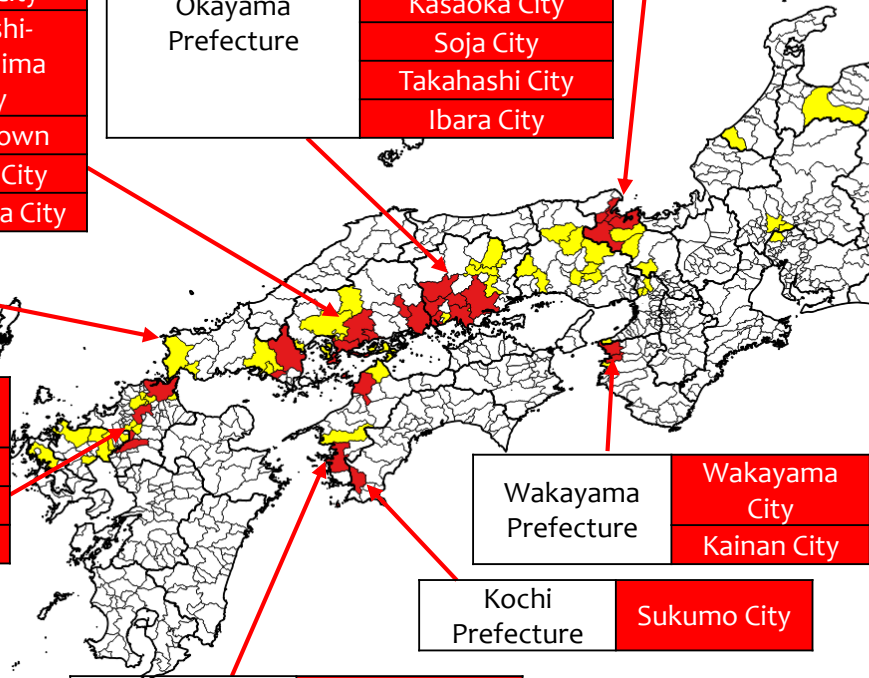
Fukuoka Prefecture	Kitakyushu City
	Kurume City
	Iizuka City
	Ogori City

Wakayama Prefecture	Wakayama City
	Kainan City

Kochi Prefecture	Sukumo City
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Ehime Prefecture	Matsuyama City
	Uwajima City

Legend: Damaged buildings	
0 :	
1-99 :	
100 or more :	



Cases of landslide damage (as of July 2)

(Prefectural reports)

1,732 cases in 31 prefectures

Debris slide: 560, Collapse of ground: 54
Collapse of cliff: 1,118

Jul. 6

Collapse of cliff

Moji Ward,
Kitakyushu City,
Fukuoka
Prefecture



2
fatalities

Jul. 6

Debris slide

Kawasumi, Kumano Town,
Aki District, Hiroshima
Prefecture



12 fatalities

Jul. 7

Debris slide

Shuto-cho, Iwakuni
City, Yamaguchi
Prefecture



1 fatality

Jul. 8

Natural dam

Oe-cho, Fukuchiyama City,
Kyoto Prefecture



Jul. 8

Collapse of cliff

Ichinomiya-cho,
Shiso City,
Hyogo Prefecture



1 fatality

Jul. 7

Collapse of cliff

Mobira, Kasaoka City,
Okayama Prefecture



2 fatalities

Jul. 7

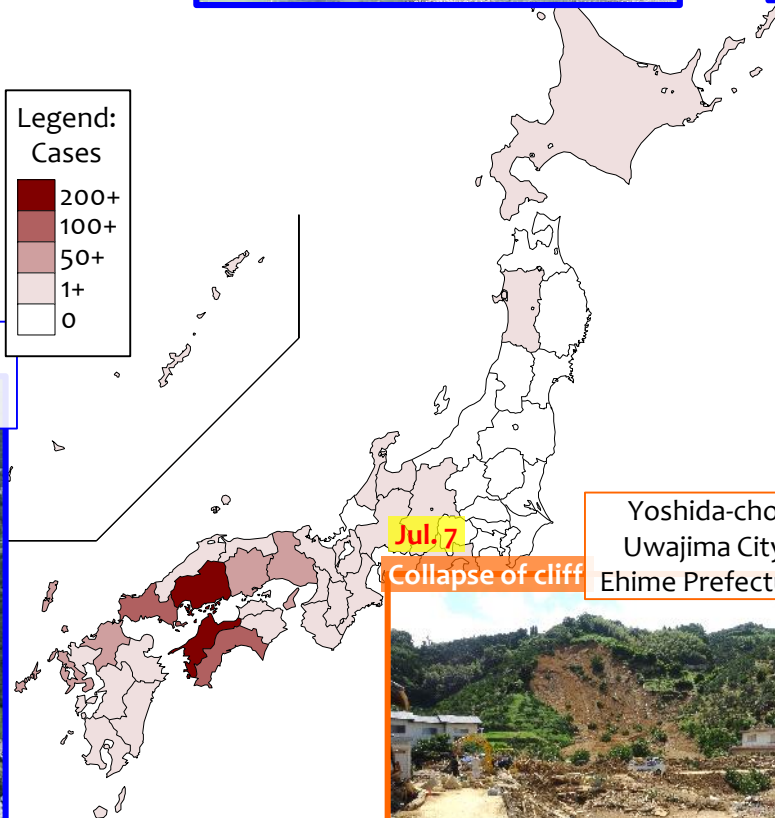
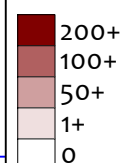
Collapse of cliff

Yoshida-cho,
Uwajima City,
Ehime Prefecture



4 fatalities

Legend:
Cases



Governmental Emergency Responses in Case of Disasters

Outbreak of Disaster(s)

Contacts & Communication: Disaster Information

- 24 hour-system
- Contact simultaneously with Emergency-reserved Members & all of the relevant Ministries

Information sharing among Ministries & Agencies

- Information from the Ministries & public organisations concerned
- Distribution & sharing: Information in the Government
- Dispatch: Information Team

Assembling of the Members

Headquarters setting up is not necessary for the time being

Urgent Assembly Team: Situation Grasping, Initial Response Coping, etc. by Emergency-reserved Members [Director-Generals of Relevant Ministries]
[in Cooperation with the Cabinet Secretariats & Relevant Ministries' Liaisons]

As to entire damage information;
• Image information [helicopter, surveillance camera, etc.]
• Primary information from relevant Ministries & public organisations, etc.

Grasping: Scale of the Damages

The necessity of headquarters setting-up

Countermeasures Policy Consultation by Relevant Ministers' Emergency Consultation, etc.

Information Summarizing & Adjustment of Emergency Measures

- Holding: Disaster Countermeasure Council by Relevant Ministries
- Coordination: Each Ministry's Emergency Measures
- Coordination: Government's Survey Team dispatch
- Operation: Local Disaster Countermeasure Office, etc.

Setup: Headquarters for Emergency Disaster Control

General Manager: Minister for Disaster Prevention

Setup Location: Cabinet Office

Secretariat: Cabinet Office

Operation of the Headquarters;

- Measures-management & general coordination for each Ministry
- Coordination: Governmental Survey Team Dispatch
- Operation: Local Disaster Countermeasure Headquarters, etc.

Cabinet Council: Setting up Headquarters

Setup: Extraordinary Headquarters for Emergency Disaster Control

General Manager: Prime Minister

Setup Location: Prime Minister's Official Residence

Secretariat : PMs Official Residence & Cabinet Office

Operation of the Headquarters;

- Measures management & general coordination: each Ministry
- Coordination: Government's Survey Team Dispatch
- Operation: Local Disaster Countermeasure Headquarters, etc.

Responses to Downpour in July 2018 [Initial Period]

Responses implemented by Official Residence & Cabinet Office

July 2

13:30 **Disaster Warning Council** by Relevant Ministries, regarding Heavy Rain occurred in West Japan & the Season's 7th typhoon

July 5

15:30 **Disaster Warning Council** by Relevant Ministries, regarding the Heavy rain caused by low pressure & the Japanese seasonal rain front

July 6

13:58 **Setup: Official Residence Communication Office**

14:30 **Disaster Countermeasures Council** by Relevant Ministries, regarding the Heavy rain caused by low pressure & the Japanese seasonal rain front

July 7

9:00 **Council by Director-Generals** of Relevant Ministries

※Hereinafter the same held at any time.

10:00 **Council by the Relevant Ministers**

10:20 **Setup: PMs Official Residence Management Office**

12:00 **Cabinet Office Information Team: Dispatch for Hiroshima Prefectural Office**

12:30 **Cabinet Office Information Team: Dispatch for Okayama Prefectural Office**

*Local information Report

*Consultation by the Government

16:55 Cabinet Office Information Team: Arrived at Okayama Prefectural Office

20:30 Cabinet Office Information Team: Arrived at Hiroshima Prefectural Office

July 8

8:00 **Setup: Headquarters of Emergency Disaster Control**

9:00 **1st Council for Headquarters of Emergency Disaster Control**

11:20 **Cabinet Office Information Team: Dispatch for Ehime Prefectural Office**

14:30 Cabinet Office Information Team: Arrived at Ehime Prefectural Office

Information Announced by the Japan Meteorological Agency, etc.

14:00 Press conference

10:30 Press conference

※A possibility of Special Warning mentioned.

Special Heavy Rain Warning announced:

17:10 Fukuoka; Saga; Nagasaki

19:39 Okayama

19:40 Hiroshima; Tottori

22:50 Hyogo; Kyoto

Special Heavy Rain Warning announced:
12:50 Gifu

Special Heavy Rain Warning announced:
5:50 Kochi; Ehime

Damage Information [Fire Defense Agency, etc.]

7/5 as of 9:00 1 person dead

7/5 as of 14:00 1 person dead

7/6 as of 7:00 2 persons dead

7/6 as of 14:00

3 persons dead; 2 persons missing

7/7 as of 3:00 Information such as a dyke-break in Kurashiki-city

7/7 as of 7:00

4 persons dead; 7 persons missing

7/7 as of 14:30

8 persons dead; 25 persons missing

7/8 as of 6:00

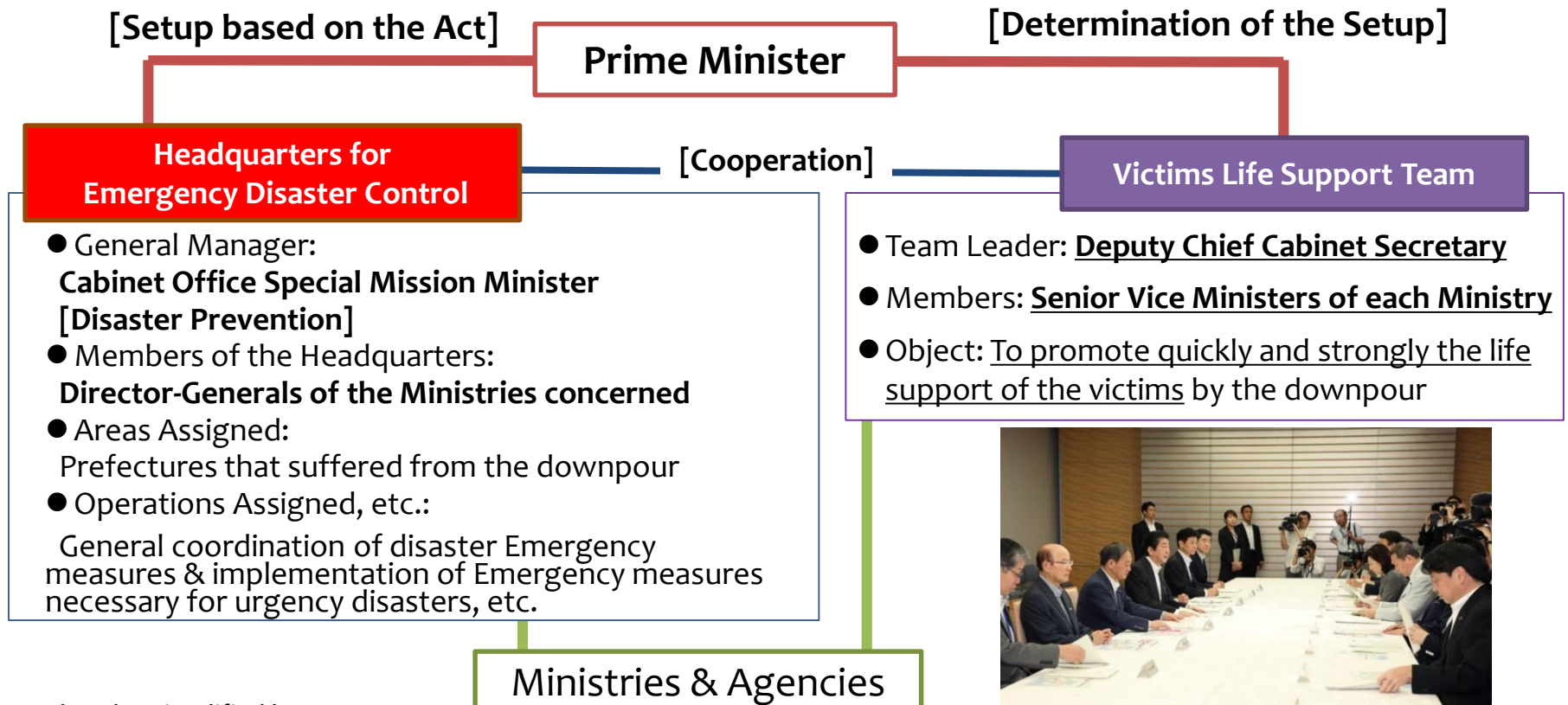
44 persons dead; 21 persons missing

※Other than this, 20 persons uncontactable

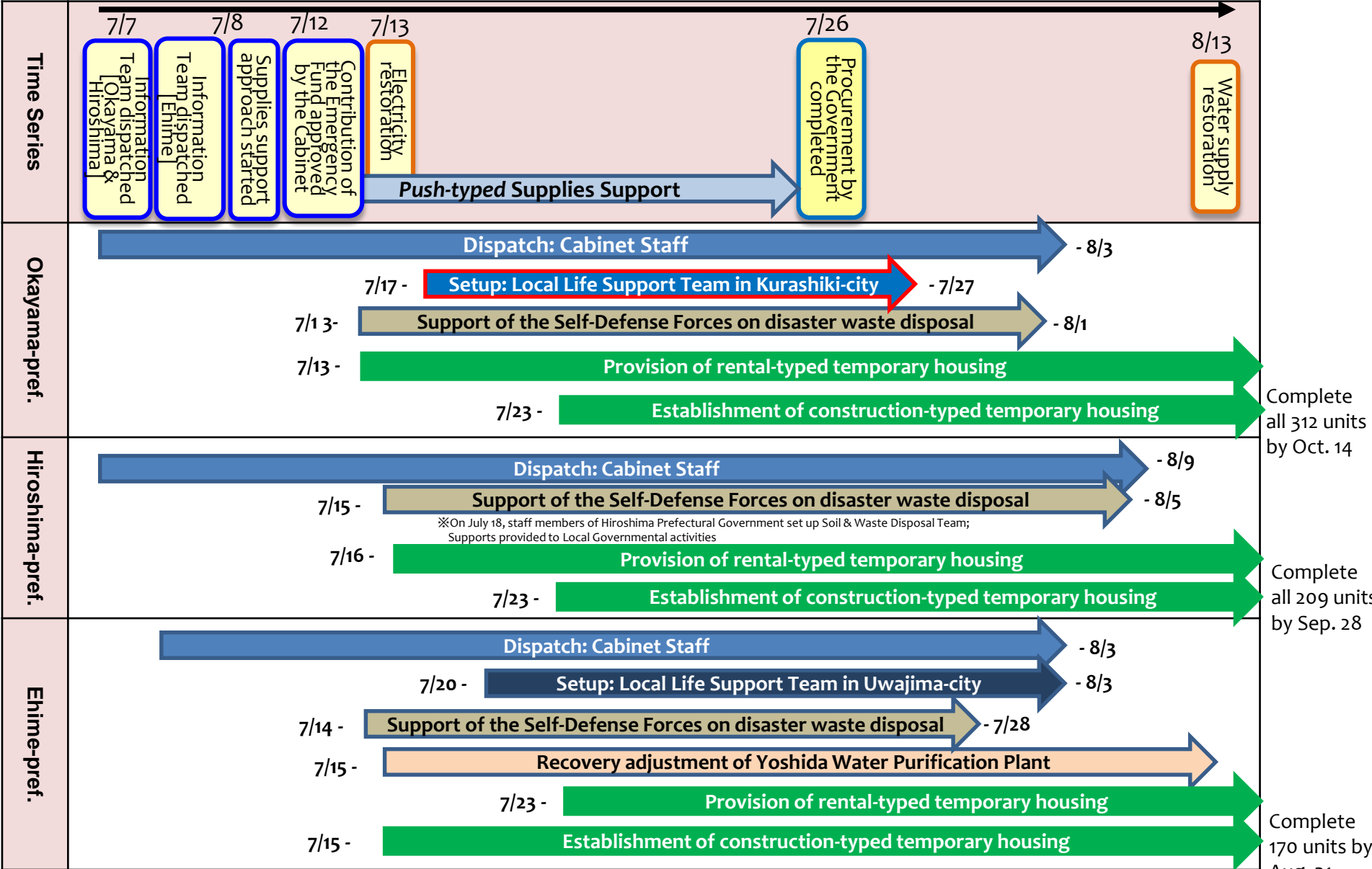
6 More Press conferences were held over the day 8 of July.

Response to Downpour in July 2018 [Lead by the Government]

- "Headquarters for Emergency Disaster Control: Downpour in July 2018" was established on July 8, in response to the expansion of damages caused by the downpour, based on the provisions of Disaster Measures Basic Act.
- "**Victims Life Support Team: Downpour in July 2018**" was established on the following day - July 9, headed by the Deputy Chief Cabinet Secretary, with the determination of the Prime Minister. [As a similar case to that of the Kumamoto Earthquake, April 2016]



Activity Status in Local Time Series [Life Support Related]



Quick Recovery supported by TEC-FORCE

TEC-FORCE (emergency damage response) squads from MLIT offices throughout Japan were mobilized to provide support for the damaged areas
(**total of 10,434 people per day** from July 3 onward. Maximum number of mobilized workers: 607 on Jul. 13)

Emergency drainage work, Damage Assessment to public infrastructure, Prevention secondary damage, Road sprinklers and road cleaners mobilization, clearing soil, gravel, fallen trees and debris.



23 drainage pump trucks deployed from around Japan
(Mabi-cho, Kurashiki City, Okayama Prefecture)



Assessment of damage in area affected by landslide (Aki Ward, Hiroshima Prefecture)



Report Investigation results and technical advice to the Mayor (Otoyo Town, Kochi Prefecture)



Investigation of mountain stream to prevent secondary damage (Mihara City, Hiroshima City)



Assistance with water supply provision and water clearing using road sprinklers



Clearing of debris, etc. in downtown area
(Saka Town, Hiroshima Prefecture)

Background:

- Quick restoration of infrastructure is critical
- Based on various disaster experiences, restoration guidelines are improved efficiently (streamlining).
- For preparation of major expected disasters, such as an earthquake in the Nankai Trough, an earthquake in Tokyo or a super-typhoon, specific measures for improvement of efficiency (streamlining) in restoration guidelines need to be determined more quickly.

Advance guidelines:

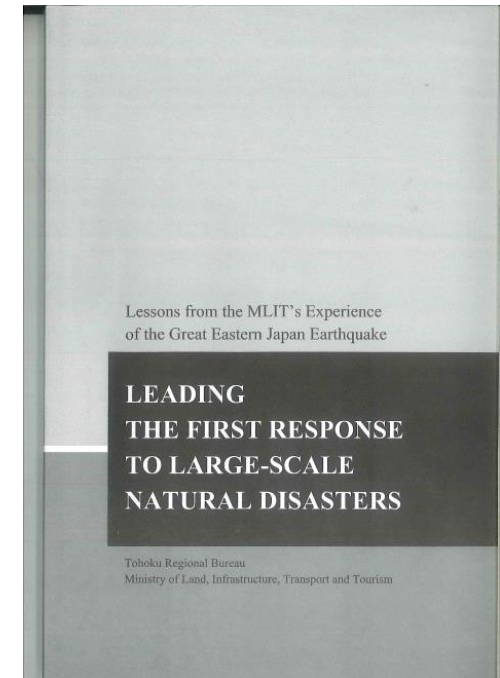
- **Category S:** Disasters that are designated as severe or designated in an advance announcement and for which an emergency disaster response headquarters is established by the Japanese government
(Past example: The Great East Japan Earthquake (2011))
- **Category A:** Disasters that are designated as severe or designated in an advance announcement
(Past examples: 14 disasters including the Kumamoto Earthquake (2016), Typhoon Talas (2011), the Niigata-Chuetsu Earthquake (2004), the Hanshin-Awaji Earthquake (1995))
- **The following efficiency improvement (streamlining) measures are carried out when a disaster is classified as Category S or A**

Main measures for improvement of efficiency (streamlining) of restoration procedures

- (1) **Increase maximum spending on administrative assessment** (to around 90% of cases of damage for Category S and around 70% for Category A) > this will shorten the time needed for assessments
- (2) **Increase disaster response budget** (around 90% of disaster response budget cases for Category S and around 60% for Category A) > Increasing the amount that can be set for restoration work on site will enable the work to be started more quickly
- (3) **Simplification of blueprints**
: Using aerial photos, standard cross-sections, etc. when creating blueprints will shorten the time needed for measurement and design

Effective measures and lessons learned from the Great East Japan Earthquake were compiled in the “Leading the First Response to Large-scale Natural Disasters”

**“We made all possible preparations.
What we prepared was still not enough.”**



Website for (free) downloading of Amazon eBook:

<http://www.amazon.co.jp/dp/BooS8UXG9G> (Japanese)

<http://www.amazon.co.jp/dp/BooS8UXFU6> (English)

Disasters with wide range damaged area make difficult grasp local various requirements and control all related organizations

- National Government Leadership was critical
- Setting up special local life support team which carefully listened requirements from municipalities and appropriate supports
- Push-typed Supplies Support was effective
- Important role of regional offices of national government for special technical supports and coordination with other related organization
 - TEC-FORCE(emergency damage response squads) had played important role for quick recovery

Thank you for your attention.

