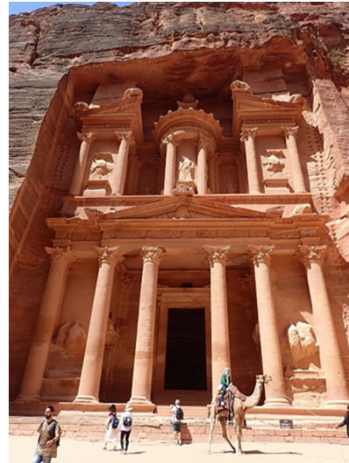


# The 5<sup>th</sup> International Symposium on Flash Floods in Wadi Systems (ISFF-2020)



February 25-28

2020 Kyoto-Japan



## Symposium Program, Statement and General Vision

Disaster Risk Reduction and Assessment for the Flood Prone Urbanized & Archaeological Wadis in Middle East and North Africa (MENA) Region



**Tetsuya Sumi**

WRRC, Disaster Prevention Research Institute,  
Kyoto University, Japan

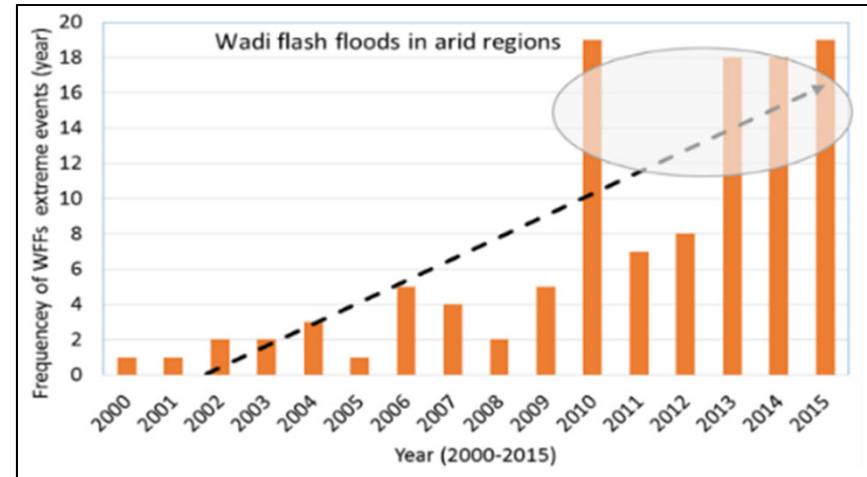
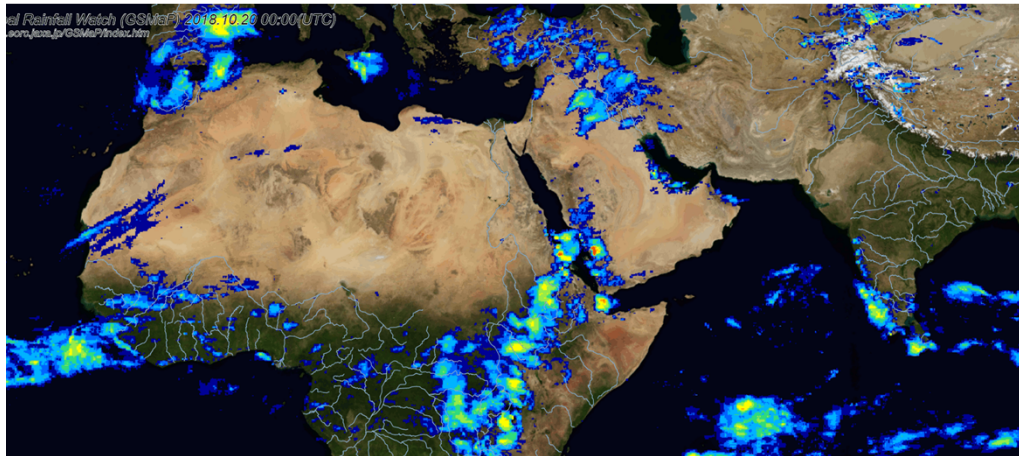


# Flash floods in Arid Regions

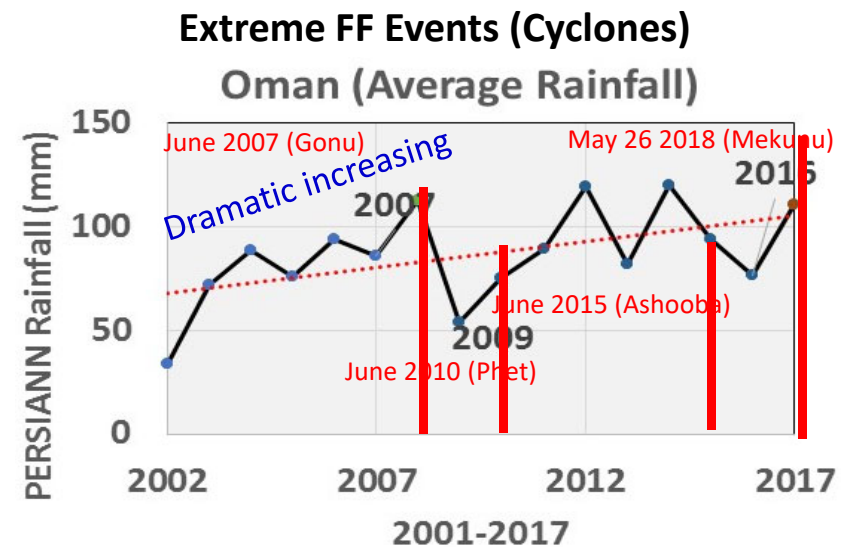
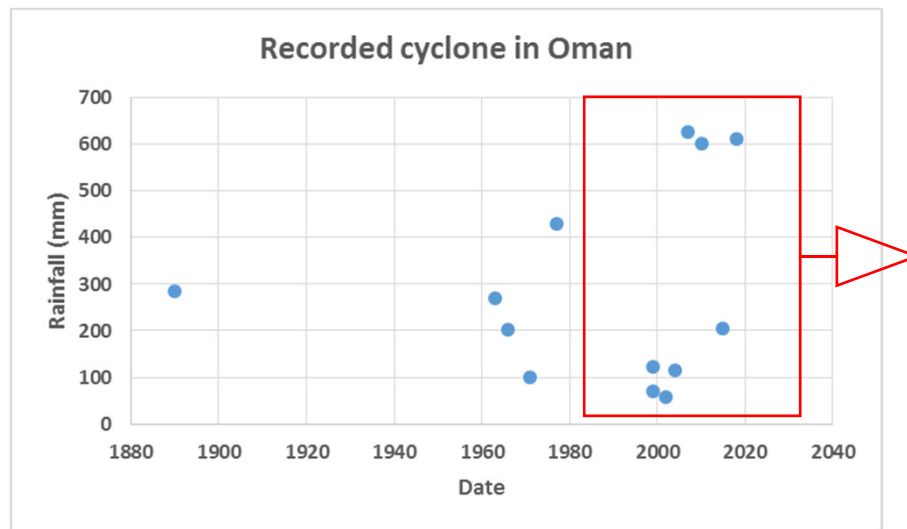


# Flash Floods Frequency and Intensities, **Why?**

(Arab Region)



(Oman)



# ISFF History

- **Kyoto University initiated research activities in 6 Arabian countries**
- **Huge efforts by governments in the MENA Region to enhance FF monitoring, modelling, mitigation structures and warning systems.**
- **Need for new paradigm shift considering comprehensive strategies, mitigation and water resources management**
- **We need to conduct more research and establish guidelines/ manuals for assessment and mitigation and utilize floodwater.**
- **Kyoto University initiated ISFF series that focusing on **DRR** by discussing current mitigation measures FF, and water harvesting.**
- **1<sup>st</sup> ISFF hosted by KU and focused on **flood protection, water harvesting, sedimentation, water management& dam constructions.****
- **2<sup>nd</sup> ISFF hosted by TUB- El Gouna campus in Egypt and focused on Case studies, UNESCO project, water harvesting, and Social aspects**
- **3<sup>rd</sup> ISFF in Oman at GUTech in Muscat focusing on Risk assessment, management and hazards mitigation..etc.**
- **4<sup>th</sup> ISFF in Morocco at Hassan II U. of Casablanca incl. Urban Flooding.**
- **5<sup>th</sup> ISFF in Kyoto 25-28 Feb. 2020 highlighting also FF in WHSs.**

# **Objectives of ISFF**

- To define priorities for future research challenges, gaps, and potential projects for Flash Floods in Wadi Systems.**
- To form a platform for networking-sharing experiences and data between the participated countries and authorities.**
- To stimulate the cooperation among researchers in fundamental and applied sciences towards WFF research.**
- To introduce Japanese technologies to help in FF protection and harvesting.**
- To develop new creative ideas and projects to adapt and mitigate FF.**

# The First International Symposium on Flash Floods in Wadi Systems (ISFF)

Disaster Risk Reduction and Water Harvesting in the Arab Region  
14<sup>th</sup> – 15<sup>th</sup> of October 2015, Kihada Hall, Uji campus, Kyoto University, Japan



**102 participants** from: Egypt, Oman, Sudan, Jordan, Saudi Arabia, UNESCO- Cairo office, from UNESCO-IHE, TUB Germany, Antea Group Belgium, Pisa University Italy, and from International Institute for Applied Systems Analysis, Austria, and Japan.





From the People of Japan



## The Second International Symposium on Flash Floods in Wadi System (2<sup>nd</sup> ISFF)

25-27 October 2016, Technische Universität Berlin, Campus El Gouna, Egypt



The **Third** International **Symposium** on **Flash** **Floods** in Wadi Systems (**3<sup>rd</sup> ISFF**)  
Organized by German University of technology (GUtech), Muscat, Oman  
5 – 7 December 2017, GUtech, Muscat, Sultanate of Oman





The **Fourth** International **S**ymposium on **F**lash **F**loods in Wadi Systems (**4<sup>th</sup> ISFF**)  
**Urban Flood Risk Management: Mitigation and Adaptation  
Measures in the MENA Region**



**Organized by Hassan II University of Casablanca**

**4 – 6 December, 2018, Casablanca, Morocco**

# Major Recommendation from past ISFF

- **Platform and public domain** for sharing data and information on wadi hydrology
- Impact of **climate change** on the variability of wadi hydrology
- Flood management with **sediment management**
  - Measurements, modelling and trapping techniques (**debris dams**).
  - Assessment of sediment transport and deposition during and after flash floods and **long-term accumulation/loses** in the reservoir
- Flood maps should be updated in hot spot regions (i.e. with rapid urbanization)
- Paradigm shift **from reactive to proactive approach in DRR.**
- Unified **regional early warning system** in the Arabian region
- Educational and awareness programs for **community based risk awareness and preparedness.**
- New methodologies.
  - Numerical modelling tools
  - Monitoring techniques with **steel plate impact sensors** and **camera.**
  - Estimation of paleo flood and morphological changes with **satellite data**

# Program Overview

**Feb. 25:** Excursion to Hiyoshi Dam, Arashiyama

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**Feb. 26:** Special Seminar Petra

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**Feb. 27:** ISFF Day 1

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- **Opening Session**
- **Session 1:** Flash Floods Challenges and Strategies
- **Session 2:** Advanced in Understandings Flood Modelling and Forecasting
- **Session 3:** Flash Flood Mitigation Measures and Warning Systems

**Feb. 28:** ISFF Day 2

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- **Session 4:** Hydrometeorology and Climate Change
- **Session 5:** Reservoir Sedimentation and Sediment Yield
- **Session 6:** Surface Runoff and Groundwater Management
- **Session 7:** Data Challenges: Monitoring, Analysis and Sharing
- **Closing Session:** Potential ISFF Projects and Roadmap

# Key Questions for Wadi FF

## 1- Rainfall **Session 2** **Session 1**

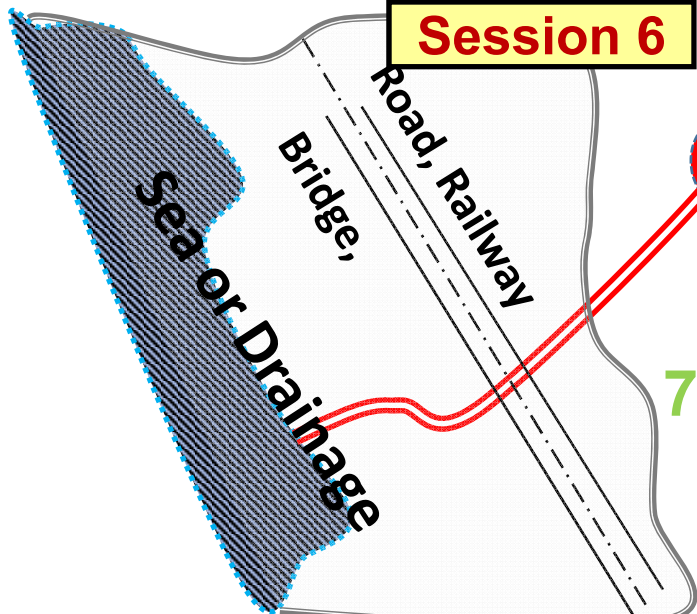
- ✚ Rainfall Intensity, Frequency, Duration?
- ✚ Rainfall Monitoring and Past Records
- ✚ Hydrological Modelling for Predication
- ✚ How much Volume, and How Fast?

## 2- Wadi Catchment

- ✚ Wadi Characteristics and Classifications

## 3- Groundwater

**Session 6**



## 5- Drainage Channel and Target point

**Session 7**

## 6- Hazards, Social & Wadi Ecosystem

## 7- Land Use Planning

Industrial, Urban, Agricultural, Touristic, Energy, and Development Areas

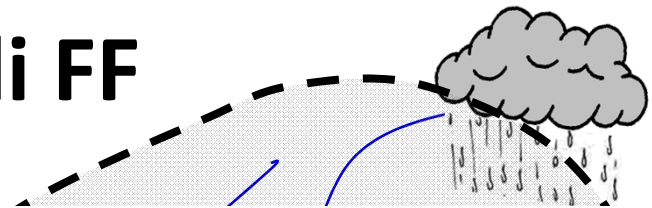
## 8- Climate Change **Session 4**

- ✚ What are the impacts of climate change on runoff and sediment yield variations (Accelerating storage loss)? Decrease of available storage per capita ?

## 4- Sedimentation

- ✚ How to select effective flash flood mitigation measures ?
- ✚ How to reduce storage loss for sustainability and mitigate environmental?

**Session 3**



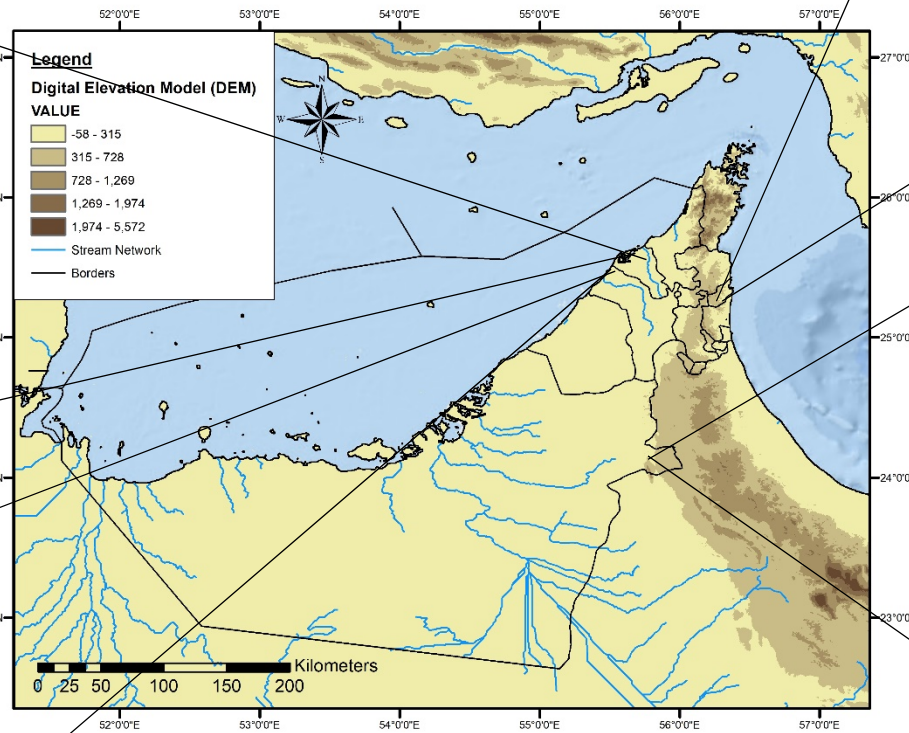
# Flash Floods Events in UAE



Apr 2019 – Ras Alkhaimah  
Source: TheNational.ae



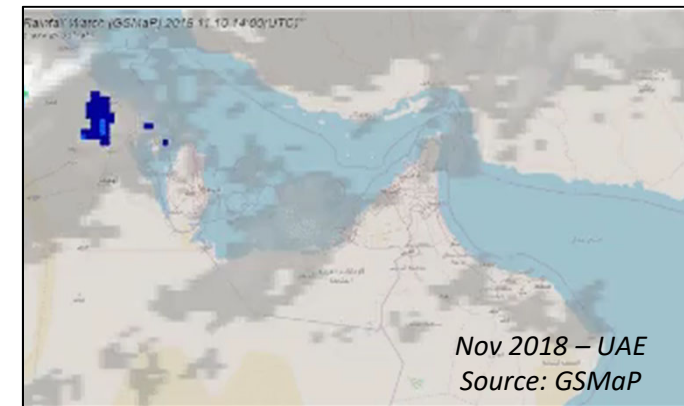
Dec 2017 – Sharjah  
Source: FloodList.com



Oct 2019 – Al Fujairah  
Source: twitter: @storm\_centre



Jul 2019 – Al Ain  
Source: Khaleejtimes



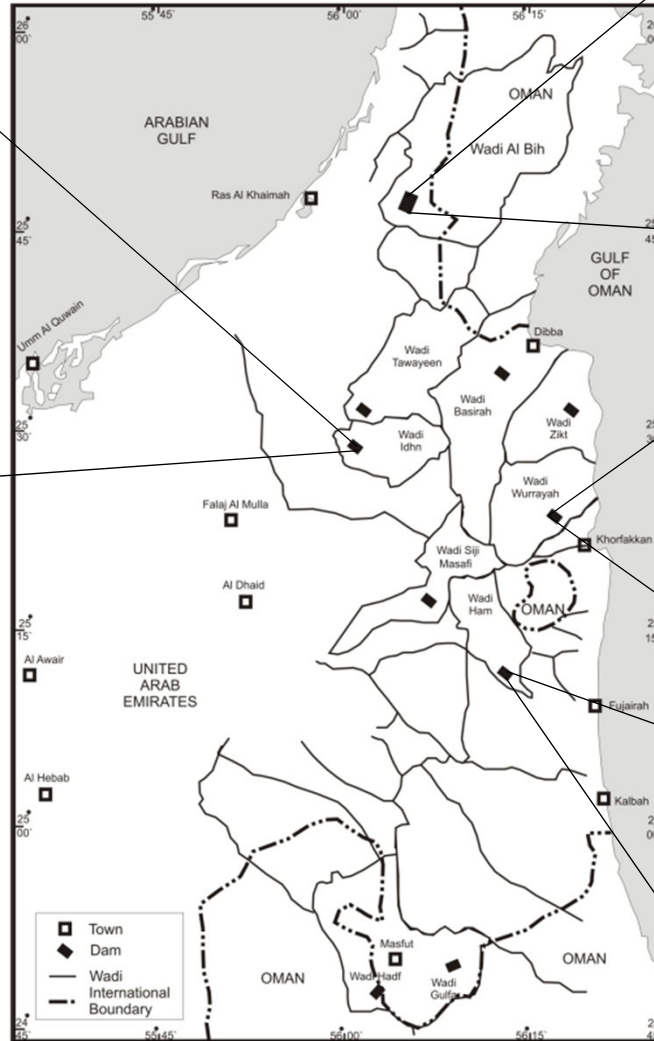
Nov 2018 – UAE  
Source: GSMaP

Event Date	Effects	Rainfall
Nov 11 <sup>th</sup> , 2018	<ul style="list-style-type: none"> <li>- Traffic chaos, Power outages</li> <li>- Garage roofs were peeled</li> <li>- No fatalities in UAE 30 dead and 4000 were evacuated in Saudi Arabia</li> </ul>	49.4 mm in hour (Abu Dhabi & Dubai)

# Current Dams in UAE



*Wadi Azan Dam*  
Source: [uaezoom.com](http://uaezoom.com)



*Location map showing major dams and wadis in east and north of UAE*  
Source: Al Nuaimi, 2007



*Wadi Al Beeh Dam*  
Source: twitter @emaratalyoum



*Wurrayah Dam*  
Source: [uaezoom.com](http://uaezoom.com)



*Wadi Ham Dam*  
Source: [uaezoom.com](http://uaezoom.com)

# Plans to build 70 dams in Northern Emirates pleases flood-hit residents and farmers



More dams and canals will bring a welcome water supply to farmers and also prevent homes being damaged by flash floods.

<https://www.thenational.ae/uae/plans-to-build-70-dams-in-northern-emirates-pleases-flood-hit-residents-and-farmers-1.209775>

- Rashid Ali, a 38-year-old Emirati from Sakamkam, where seven dams have already been built, said that **winter had now become a great season**.
- The head of geology at UAE University, Dr Khalid Al Bloushi, said that the nature of the mountainous north and east of the country was such that more dams needed to be built.
  - The mountains and valleys are a good spot to build dams to impound rainfall, reduce salinity and replenish groundwater supplies.
  - Our mountains are made of rocks that do not absorb the water, therefore we need to have more dams to keep and preserve rainwater.
  - Without dams, rainfall will go through the valleys and into the sea.

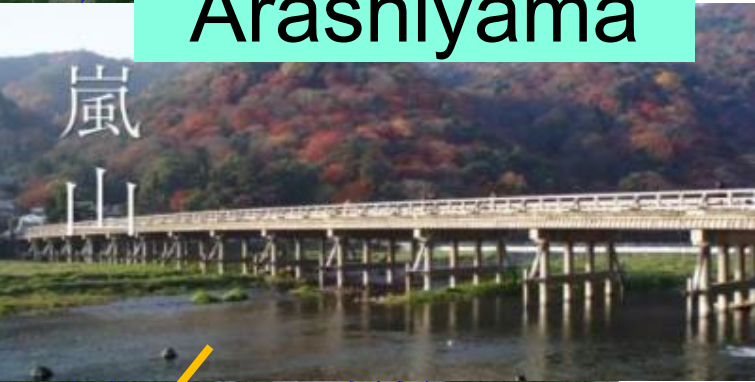
# Hiyoshi Dam and Katsura River



1997, Japan Water Agency  
H=67.4m, V=66 MCM A=290km<sup>2</sup>



Arashiyama



013.DigitalGlobe  
13 ZENRIN  
nes/Spot Image  
Google earth  
35° 11'51.90" N 135° 26'34.07" E 標高 243 m 高度 41.02 km



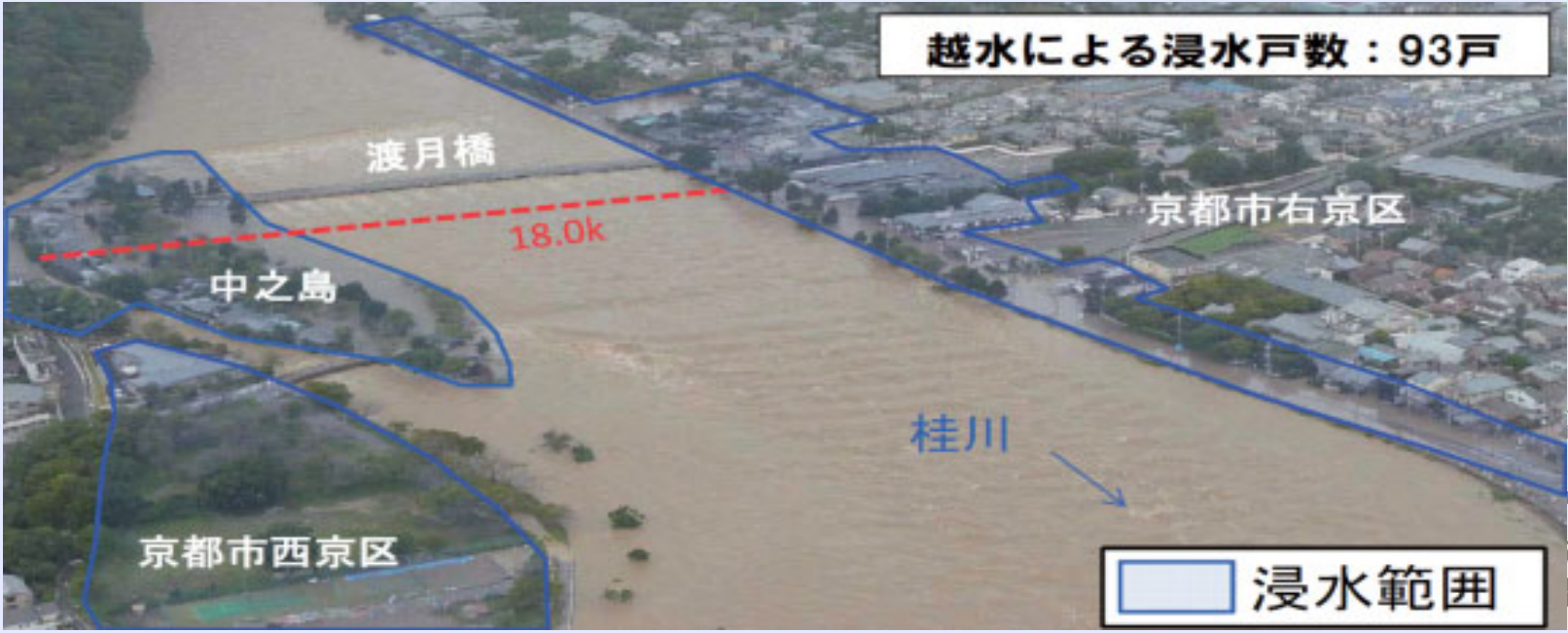
# Hiyoshi Dam



# Togetsu Bridge, Arashiyama



# Effect of Hiyoshi dam

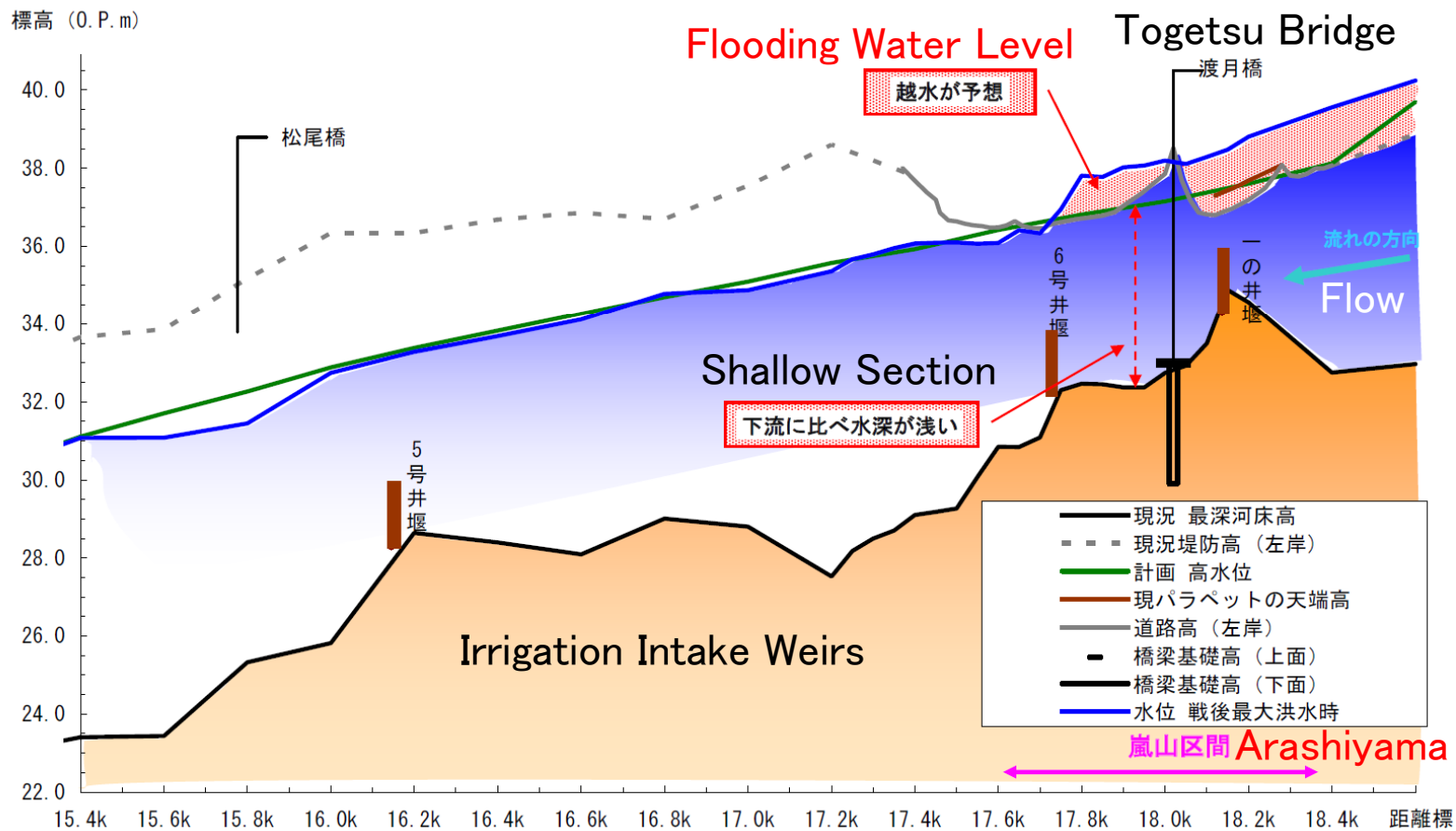


Source: MLIT

# Longitudinal River Bed Profile

Narrow River Channel, Shallow Riverbed and many bridges and weirs causes increase of water level.

Large excavation scenarios may cause landscape degradation.



Source: MLIT

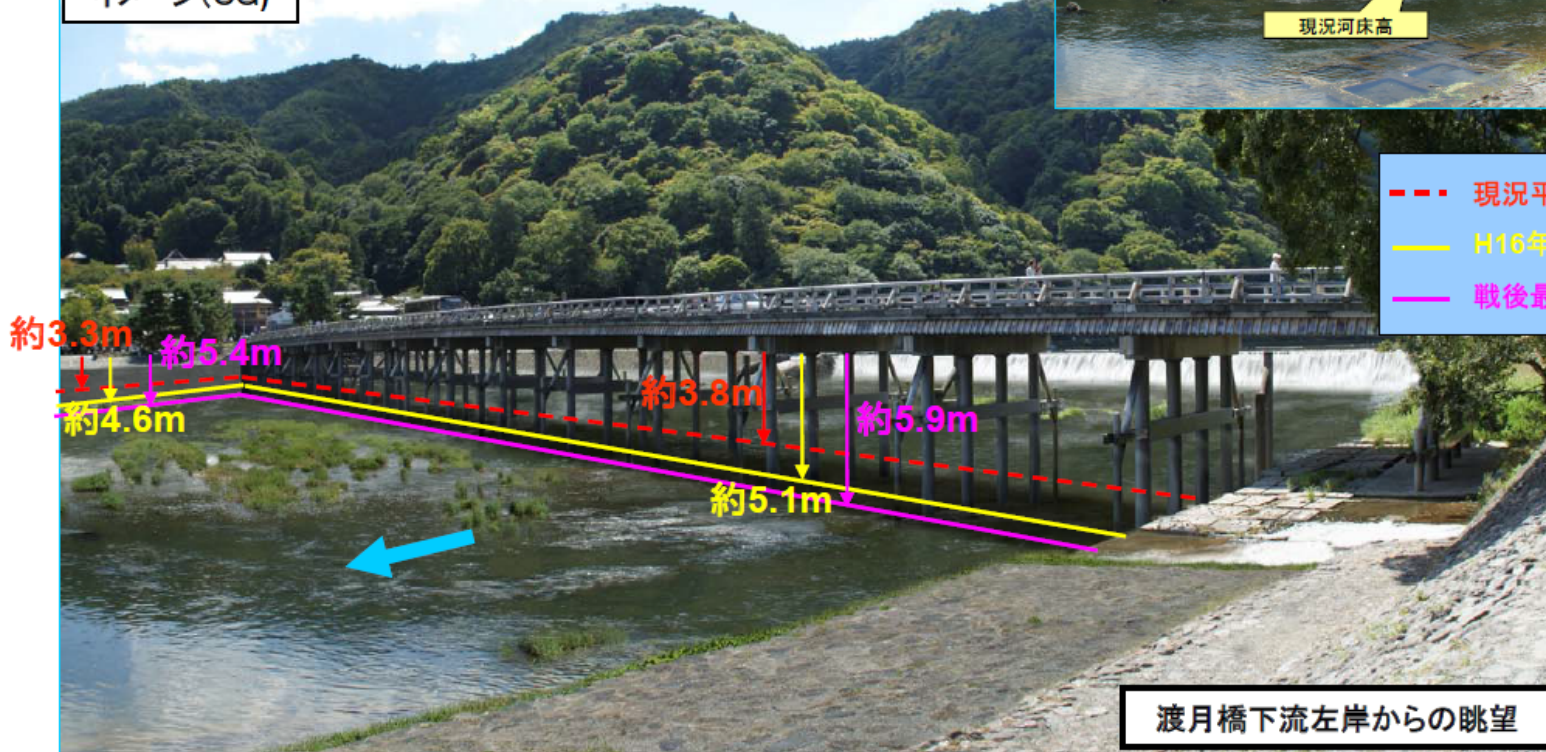
# Large Impact on Landscape after Riverbed Excavation

Source: MLIT

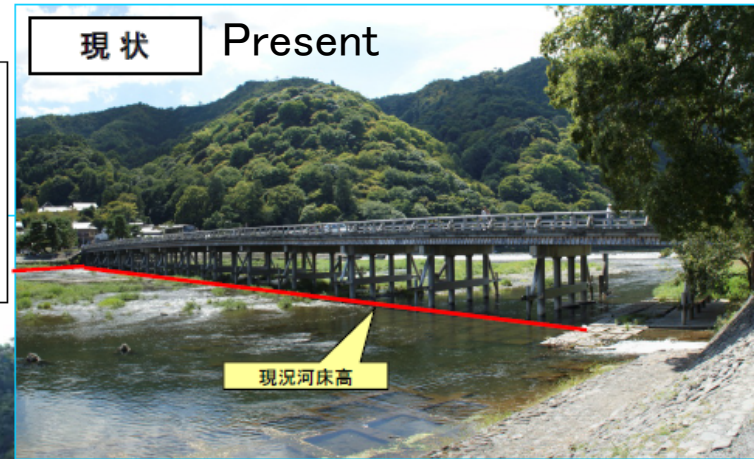
## 河床掘削実施後の渡月橋イメージ

Large Excavation Scenarios are not preferred from the point view of Landscape and Touristic Values

## イメージ(CG) Excavation Scenarios



※橋～水面までの空間の見えの変化

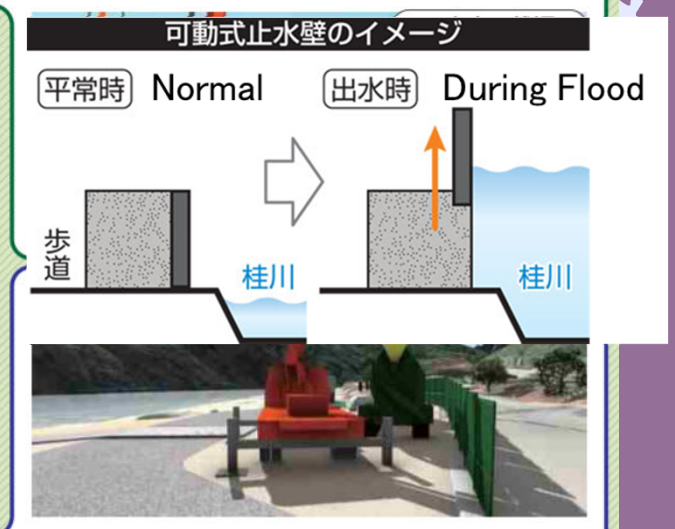


- 現況平水位 Present
- H16年洪水対応平水位
- 戦後最大洪水対応平水位

Excavation Scenarios

# Flashboard to protect upstream of Togetsu Bridge

Source: MLIT



# Participants Information

Country	Number of papers	Oral/Poster	
		Oral	Poster
Algeria	7	3	4
Bangladesh	1	0	1
China	1	1	0
Egypt	11	7	4
Japan	13	7	6
Jordan	3	2	1
Morocco	4	3	1
Oman	6	4	2
Philippines	1	0	1
Saudi Arabia	1	1	0
Sudan	2	2	0
Tunisia	1	1	0
United Arab Emirates	3	2	1
Yemen	1	0	1





# Partner and Sponsors

