Workshop on Disaster information dissemination system for local community in rural mountainous area: part I

January 23-26, 2012

Workshop on Disaster Information Dissemination System for Local Community in Rural Mountainous Area: Part I

January 23rd – 26th, 2012
Tokyo, Japan

Co-Organized by

International Center for Urban Safety Engineering (ICUS)
Institute of Industrial Science
The University of Tokyo, Japan

and
Regional Network Office for Urban Safety (RNUS)
School of Engineering and Technology
Asian Institute of Technology (AIT), Thailand

Edited by

Dr. Akiyuki Kawasaki,

Table of Contents

Opening ceremony (Dr. Kawasaki)

Dr. Komori Daisuke

Dr. Manop Kaewmoracharoen

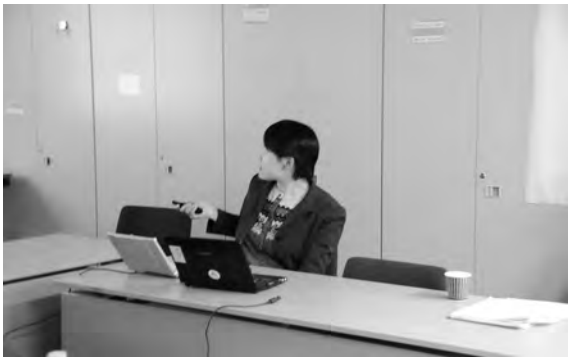
Mr. Akira Kodaka

Dr. Adisorn Suntrarak

Dr. Sangam Shrestha

Dr. Shinya Kondo

Dr. Sarawut Ninsawat



Dr. Miho Ohara

Ms. Salinthip Kungvalchokechai

Mr. Tetsuya Ishikawa

Dr. Akiyuki Kawasaki

Presentation and Discussion on 23 January 2012

Visitation to the Foundation of River & Basin Integrated Communications

Workshop and Welcome party


Visitation to Arakawa-Karyu Office in the Ministry of Land


Iwabuchi Water Gate of the Arakawa River


Visitation to the Life Safety Learning Center of Tokyo Fire Department


Sumida River boat Cruise & Disaster Prevention Experience-learning Facility

Disaster Responses in Thailand's Great Flood 2011

Manop Kaewmoracharoen

DISASTER RESPONSES IN THAILAND'S GREAT FLOOD 2011

Manop Kaewmoracharoen
Chiangmai University

ABSTRACT

The presentation will present the timeline of disaster response of Thailand's Great Flood 2011. The situation started from September 2011 in Chaing Mai, a northern province of the country, through Bangkok, the Thailand's capital. In each region there were different types of information processed by the nation and local government responding to each situation. Several warning systems were used which some were effective, and some were ineffective. In Bangkok Flood, government official were divided into two groups working separately, one is Bangkok Metropolitan Administration and the other is Flood Relief Operations Centre (FROC) by Thai Government. The FROC itself was highly criticized as unreliable, unresponsive, and non-professional by Thai and foreign medias.

THAI FLOOD 2011

Manop Kaewmoracharoen, Ph.D.
Chiang Mai University

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Faculty of Engineering

Contents

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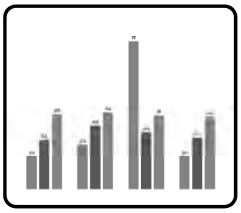
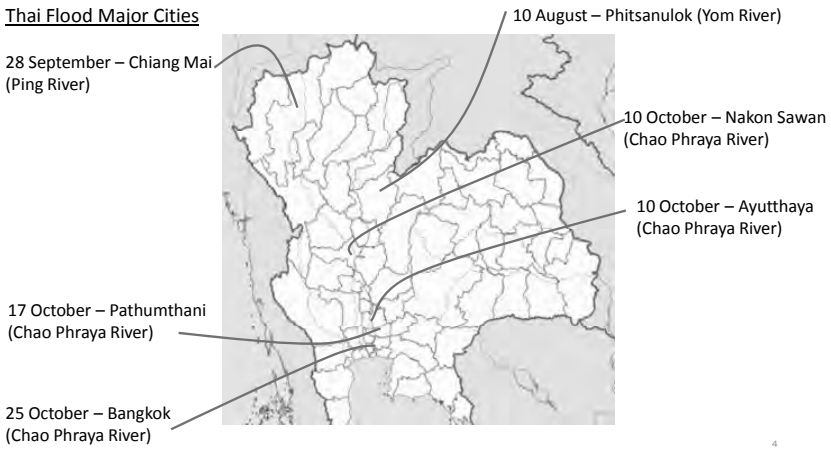
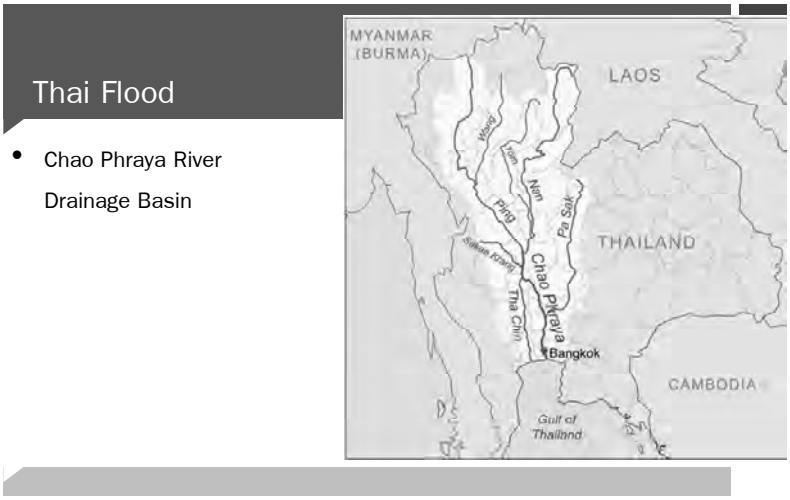
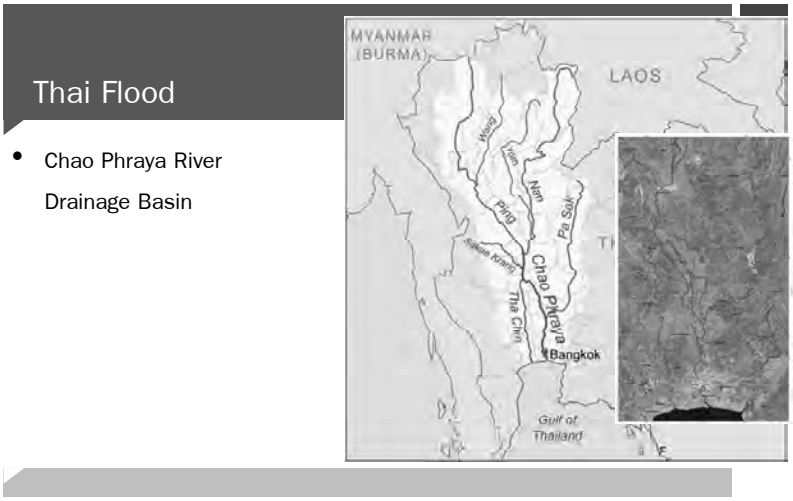
- Great Flood in Thailand
- Flood from
  - Chiang Mai
  - Nakhon Sawan
  - Ayutthaya-Pathumthani
  - Bangkok
- Information Sources



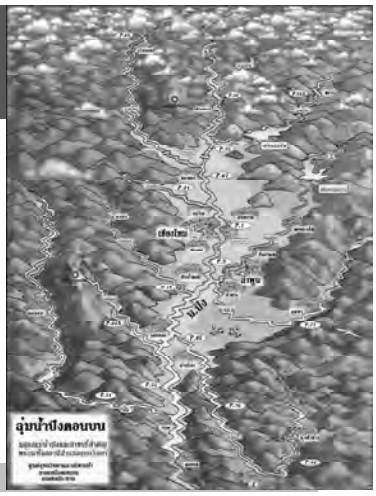

Thai Flood Major Cities
10 August – Phitsanulok (Yom River)
28 September – Chiang Mai (Ping River)
10 October – Nakon Sawan (Chao Phraya River)
10 October – Ayutthaya (Chao Phraya River)
17 October – Pathumthani (Chao Phraya River)
25 October – Bangkok (Chao Phraya River)
4


Thai Flood
Chao Phraya River Drainage Basin
MYANMAR (BURMA)
LAOS
THAILAND
CAMBODIA
Bangkok
Gulf of Thailand
Wang
Yom
Nan
Ping
Pa Sak
Sakae Krang
Tha Chin
Chao Phraya


Thai Flood
Chao Phraya River Drainage Basin
MYANMAR (BURMA)
LAOS
Bangkok
Gulf of Thailand
Wang
Yom
Nan
Ping
Pa Sak
Sakae Krang
Tha Chin
Chao Phraya

Flood in Chiang Mai

Chiang Mai and Ping River



Chiang Mai Flood

9

10

11

12

13

14

15

Chiang Mai Flood

16

- 1952
- 1973
- 1987
- 1994
- 2001
- 2005
- 2011

17

- Information Sources in Chiang Mai
  - Electronic Sign boards
  - Radio
  - Paper Sign boards
  - Internet
  - Flood zone maps

Electronic sign board

18

- 15 stations around Chiang Mai
- 3 organizations
  - Chiang Mai Municipality
  - Department of Rural Roads
  - Chiang Mai University

Warning tower / Silent tower

19

- 3 towers
- 3 locations along Ping River
- Chiang Mai Municipality

Radio

20

- FM 93.25
- FM 100
- Several local radio networks

Internet

21

- News, Knowledge center – CENDRU (Chiang Mai University) http://www.cendru.net
- Water levels, critical levels – Hydrology and Water Management Center for Upper Northern Region http://www.hydro-1.net
- Center data for Water level – Chiang Mai Province http://warning.chiangmaipoc.net
- Department of Water Resources http://www.dwr.go.th

CENDRU 22

- Chiang Mai Flood Zone Map
- Zone 1-2

CENDRU 23

- Chiang Mai Flood Zone Map
- Zone 3-4

CENDRU 24

- Chiang Mai Flood Zone Map
- Zone 5

CCTV – water level of Ping River on Nawarat Bridge 25

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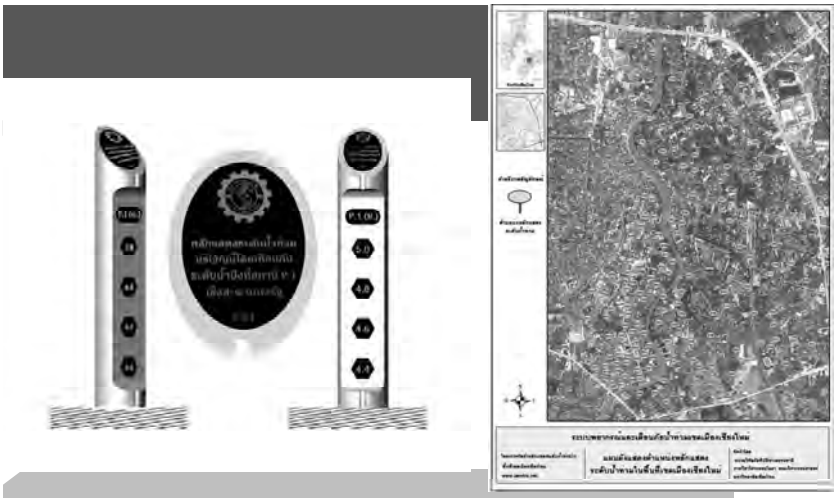

Summary for Chiang Mai Flood

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- Most of the information are in Thai
  - Some areas were blacked out for a few days – No information
- Some information in English such as
  - Newspaper – Bangkok Post
  - Online – blog posts, discussion forums
  - No local agencies providing information in English or other languages

Flood in Nakon Sawan

Nakon Sawan Flood

30

24 September

24 September

Nakon Sawan Flood 31

10 October (1pm)

10 October (1 pm)

Nakon Sawan Flood 32

10 October (8 pm)

10 October (9 pm)

Nakon Sawan Flood 33

11 October

11 October

Nakon Sawan Flood

34

11 October

11 October

Nakon Sawan Flood

35

19 October

20 October

Summary for Nakhon Sawan Flood

36

- 10 days no electricity in the municipality (10-19 October)
- 14 days no water in the municipality (10-23 October)
- Early helps
  - Nakhon Sawan Municipality
  - Army Soldier (Jiraprawat Camp)

Flood in
Ayutthaya & Pathumthani

Ayutthaya World Heritage Site

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- Historic City of Ayutthaya
- Ayutthaya Historical Park
- UNESCO World Heritage Site

Historic City of Ayutthaya
Source: The Nation

Ayutthaya-Pathumthani
Industrial Estates / Industrial Parks

39

1. 5 October – Saharatana Nakorn (49 factories)
2. 9 October - Rojana Industrial Park (198 factories)
3. 13 October - Hitech Industrial Estate (143 factories)
4. 15 October – Bangpa-in Industrial Estate (90 factories)
5. 16 October – Factory Land Industrial Estate (94 factories)
6. 17 October- Navanakorn Industrial Promotion Zone (400 factories)
7. 20 October – Bang Kradi Industrial Park (44 factories)

Effect of Thai floods on Japanese companies

40

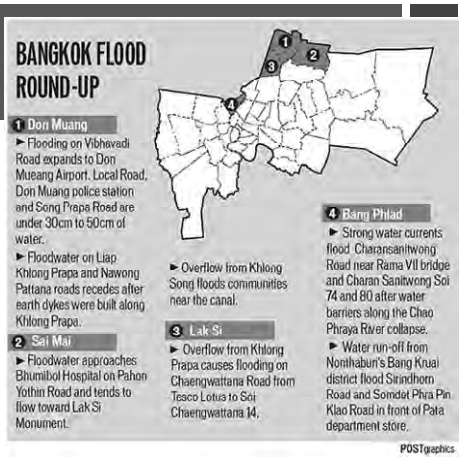
About 320 Japanese companies:

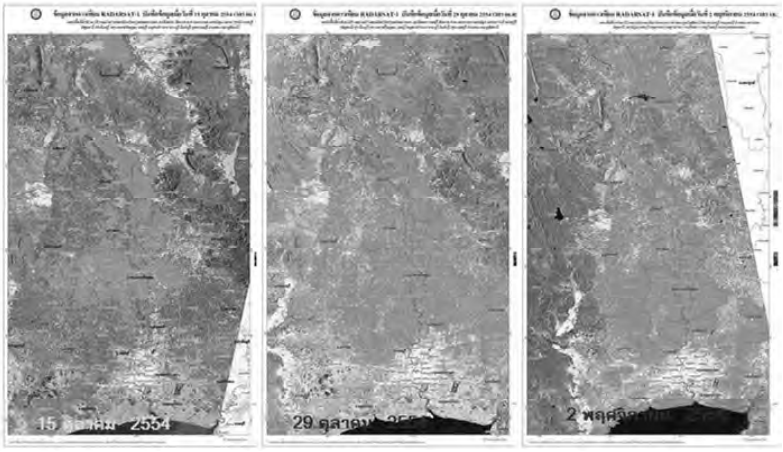
- Ajinomoto
- Honda
- Isuzu
- Nissan
- Toyota
- Canon
- Nikon
- Sony
- TDK

Bangkok

41

- Don Mueang Airport
- 25 October – All flights cancelled





15 October 29 October 2 November 43

Information Sources

Information Sources [Thai official] 45

- FROC – Flood Relief Operations Command
- Thai government's disaster (http://disaster.go.th/) [TH/EN]
- GISTDA – Geo-Informatics and Space Technology Development Agency
- Bangkok Metropolitan Administration
  - Canal Water Level
  - Water Quality
  - SCADA

Information Sources [Social networks]

46

- Twitter with hashtag #ThaiFlood
  (same name as above but different)
- Facebook fan pages
- Discussion forums such as Pantip.com

1 Week

#	tag	hits
1	#thaiflood	141,980
2	#ch3	16,159
3	#perfunn	12,198
4	#prayforthailand	10,741
5	#cheewitgu	9,621
6	#LOVEBLOODTYPE	8,589
7	#ThaiQuote	8,414
8	#ThaiPBS	6,862
9	#springnews	6,356
10	#gugroupo	6,224
11	#bkkflood	6,003
12	#T	5,913
13	#urfakelady	5,789
14	#okayleaw	5,165
15	#THAI	5,012
16	#ch7	4,729
17	#DrPop	4,497
18	#imnameA	4,483
19	#tainisai	4,441
20	#Tha	4,279

1 Week

#	word	hits
1	น้ำท่วม	384,818
2	ฝนตก	74,893
3	ยิ่งลักษณ์	66,400
4	ร้อน	66,121
5	น้ำตา	42,408
6	เกาหลี	33,883
7	เหงา	32,490
8	blackberry	30,066
9	iPhone	29,167
10	เลือด	27,666
11	ทหาร	26,320
12	ญี่ปุ่น	22,174
13	หนาว	21,160
14	true	20,082
15	สยาม	19,464
16	liverpool	18,516
17	ดราม่า	18,096
18	ประชา	17,809
19	รถติด	17,079
20	ลาดพร้าว	16,886

Information Sources [Organizations]

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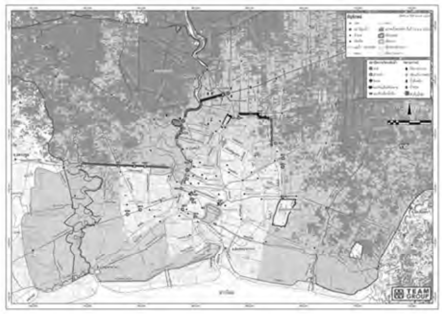
- Thaiflood.com
  - [>100,000 Twitter followers, >60,000 Facebook Likes]
- Team Group
  - Flood maps, Flood management plans



Information Sources [Organizations]

48

- October 11 – Google Crisis Response Map [EN/TH]
  - Flood area, shelters, donation points, satellite images
- October 25 – RooSuFlood (a knowledge center)
  - YouTube and Facebook page
    (Some video clips has > 1,000,000 page views, Facebook >100,000 Likes)

RooSuFlood (lit. know and fight the flood)

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- 25 October – Founded
- Manga-like animation
- YouTube video with Facebook page based (>100,000 fan likes)
- Provide basic knowledge how to prepare for flood and evacuation

FROC

FROC

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- Flood Relief Operations Command (FROC)
- Headquarter in Don Mueang Airport and then Energy Complex Building
- 8 October – FROC founded
- 10 October – Website created http://www.floodthailand.net/
- 29 October – The headquarter moved due to the airport flooded

FROC

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- 8 December – downsize staff from 2,000 - 200
- Ineffective handling of donations and poor communications
- Resist to declare state of emergency

Problems – Handling of donations

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- All donations requests needed to have request letters
- All requests needed to be approved by the director

Problems – Poor Communications

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- Too late to alert
  - Navanakorn Industrial Promotion Zone
    - 17 October – 1.5-2.0 underwater and evacuation alert on the same day
- Re-locate Shelters
  - Don Mueang Airport, Thammasat University, etc.
- No exact information
  - Five-day holiday with nothing

Problems

55

- Confused information
- No clear evacuation plan
- No evacuation by residents themselves
- Cannot answer these simple questions
  - Will my house under water?
  - Where is the places currently under water?
  - What should I do now?

FROC Parody

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FROC Parody [in Thai / English]

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Remarks on figuration of internet-based information from a point of view of an end user- A case of the Thailand's great flood 2011

Akira Kodaka

REMARKS ON FIGURATION OF INTERNET-BASED INFORMATION FROM A POINT OF VIEW OF AN END USER-A CASE OF THE THAILAND'S GREAT FLOOD 2011

Akira Kodaka
Loei Fund for Nature Conservation and Sustainable Development

ABSTRACT

A massive amount and a huge variety of disaster-related information have been disseminated during the Thailand's great flood 2011. Crowd sourcing via internet-based media is one of the main information sources mashing up with social media and map applications such as Twitter, Facebook, and Google map. Utilizing such method has advantages including emergent response due to prompt information creation and dissemination done by experts and/or someone from around the world. This presentation shows figuration of such information regarding its source and type on the Thailand's great flood and proposes further improvement from a point of view of an end user.

Remarks on figuration of internet-based information from a point of view of an end user

-A case of the Thailand's great flood 2011-

Akira KODAKA
Loei Fund for Nature Conservation and Sustainable Development

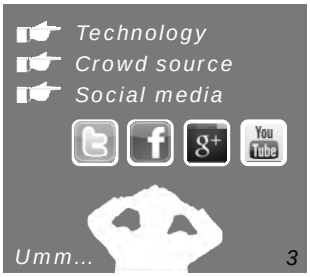
23rd Jan. 2012

Introduction

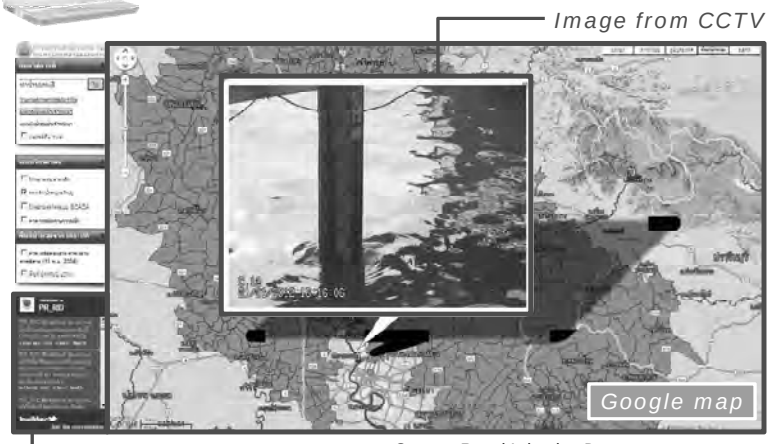
Development of Web Mapping Service & RS Techniques

2

Let's find a info.



Mash-up



Source: Royal Irrigation Department

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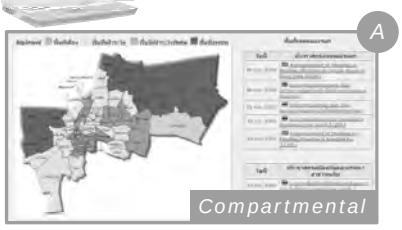
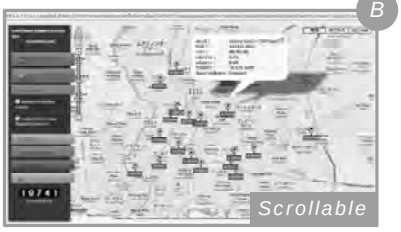
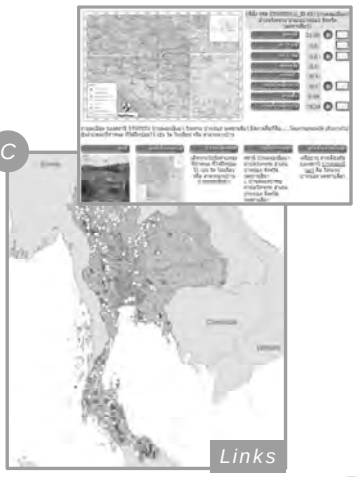
Type of maps



Source: Bangkok Metropolitan Administration



Source: Bangkok Metropolitan Administration



Source: Department of Water Resources

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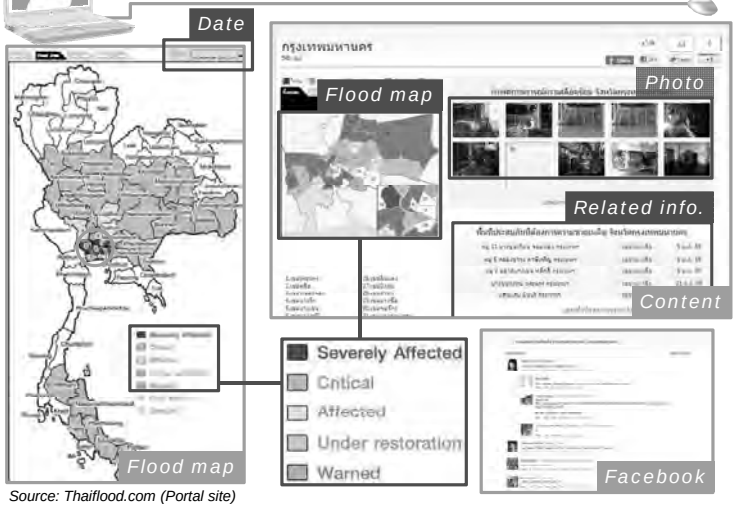
Compartmental map



Source: Thaiflood.com (Portal site)

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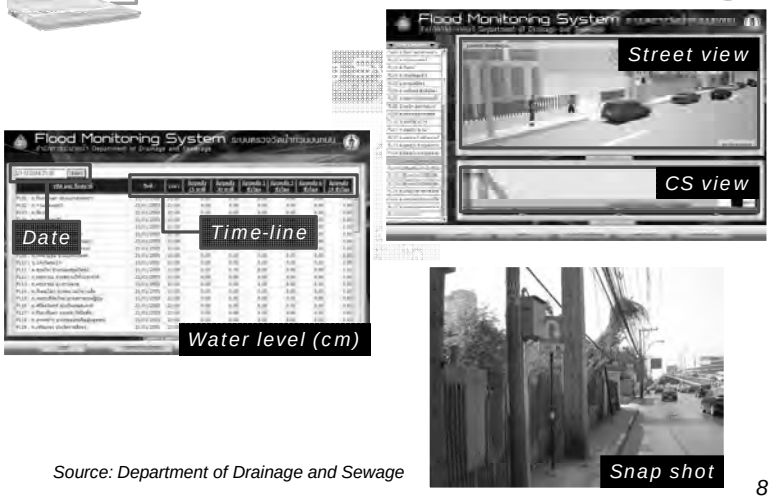
2 Scrollable map

Source: ESRI Flood Map

7

2 Linked map



Source: Department of Drainage and Sewage

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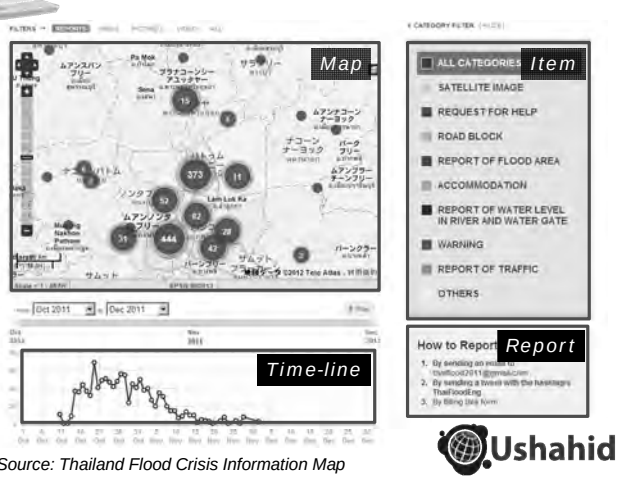
2 Crowd map



Source: Thailand Flood Crisis Information Map

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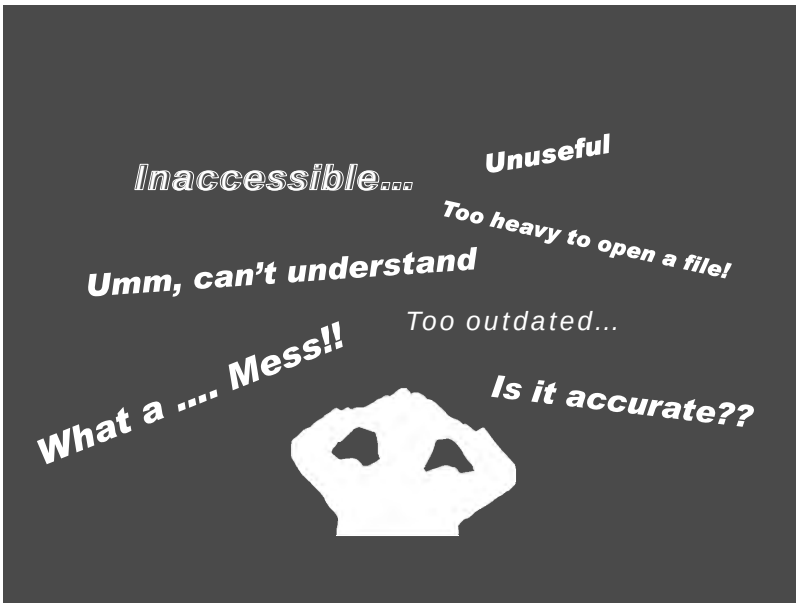
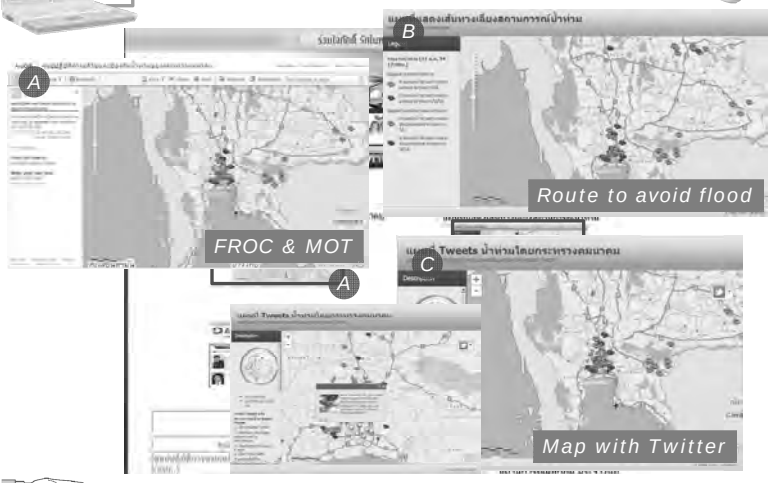


Case1: Overlapping



Better to be combined

Source: Ministry of Transport (portal site)

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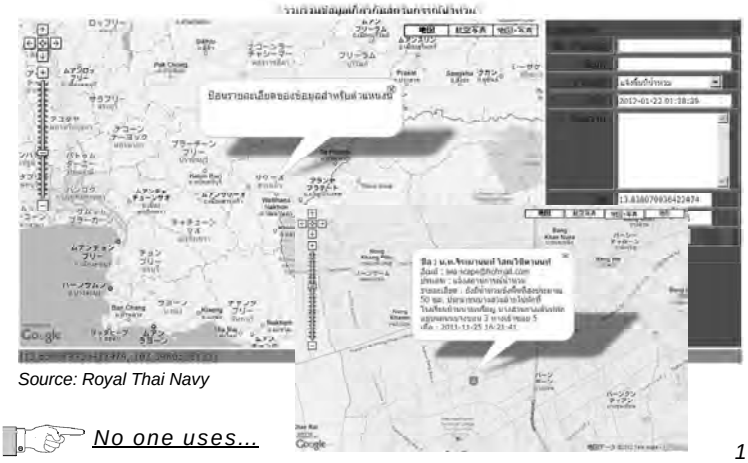
Case2: Inactive map



Source: Royal Thai Navy

No one uses...

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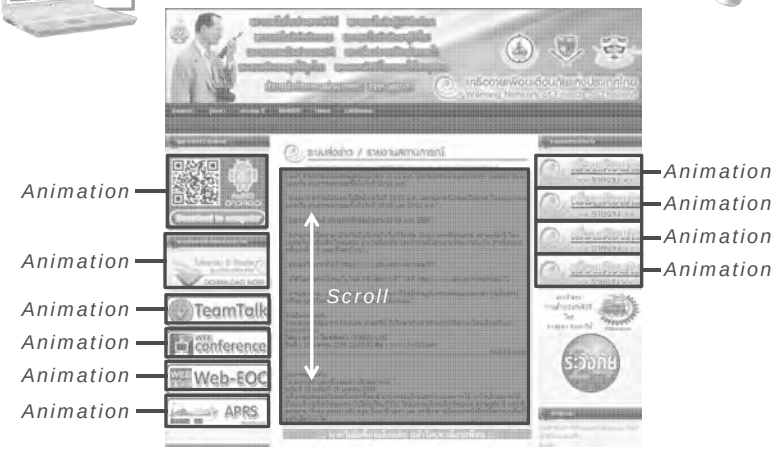
Case4: Unreliable map

Source: Open source

You can't be serious... 13

Case3: Heavy site

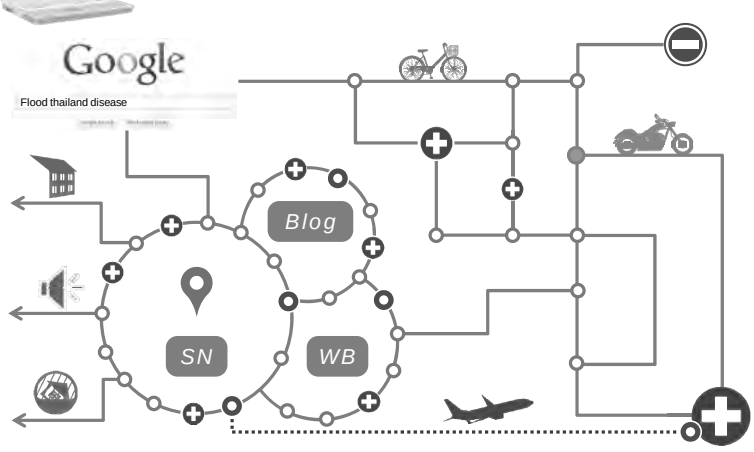


Source: Warning Network of Friends of Thailand

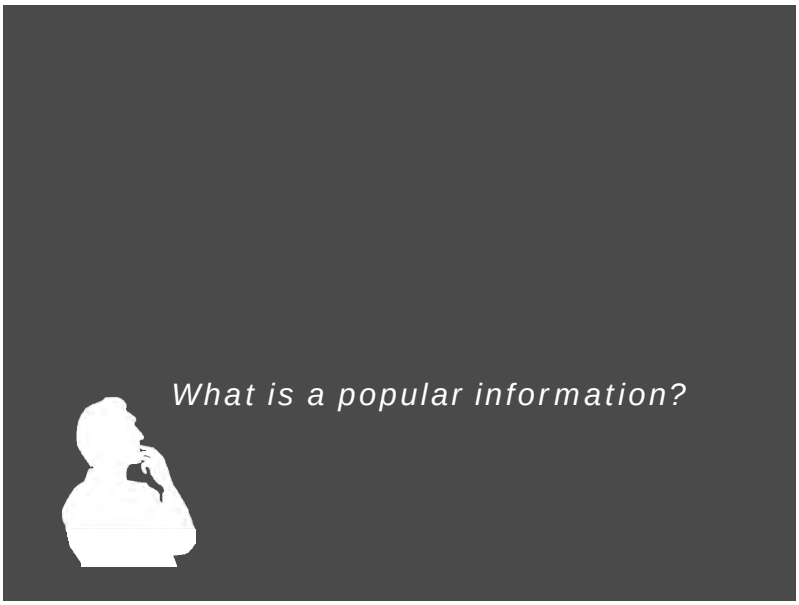
Dead link

Keep it simple, stupid (KISS) 14

A trip to information



Social media acts as a compass to get a desired info. 15



3 Utilization of Social media

Twitter

Public Organizations	Follower
Thaiflood (Portal site)	104190
Royal Irrigation Department	9787
National Flood Relief Coordination Center	13286
Department of Drainage and Sewage	31604
Water Resources Department	194
Japan-Embassy Thai	3880
Flood Relief Operation Center (FROC)	12186

Facebook

Public Organizations	Like
Department of Drainage and Sewage	28590
Royal Irrigation Department	15661
The Bangkok Governor	20748
DDPM	967
Ministry of Public Health	41
Department of Water Resources	287

On 25th Dec. 2011

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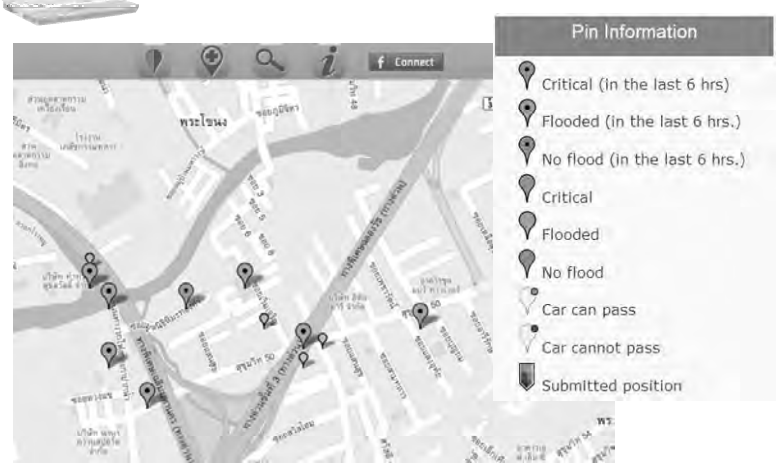
3 Freshness of information



Source: gamling.com

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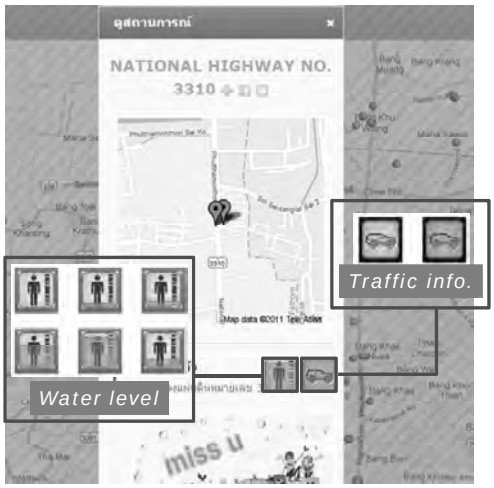
3 Visualized map

Water level

Level change

Source: FROC

Visualization



Source: gamling.com

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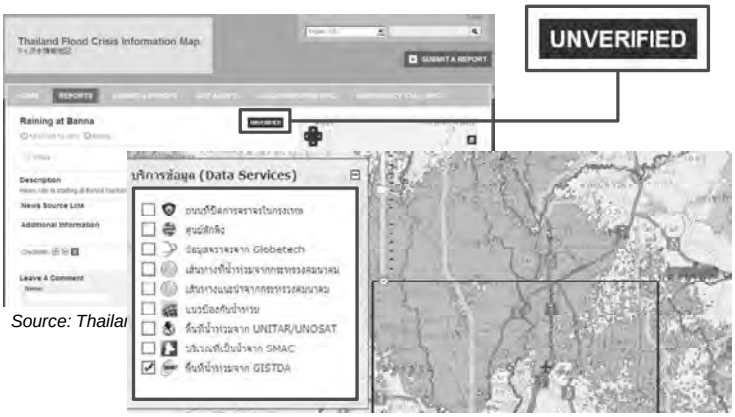
3 Reliability



Source: Thailand Flood Crisis Information Map

Source: ESRI Flood Map

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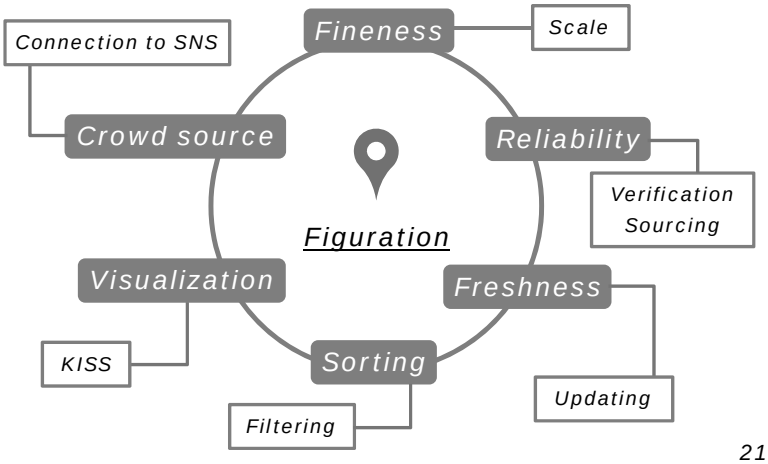
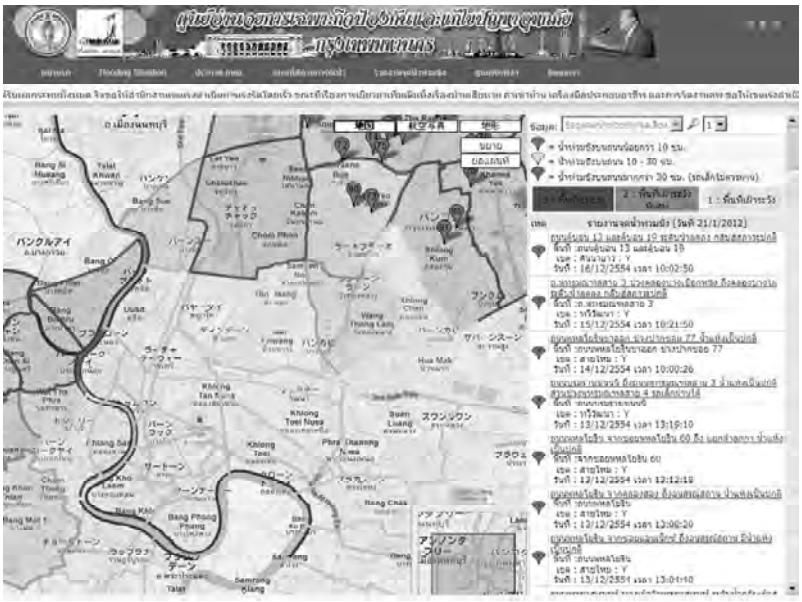
3 Conclusion



21




ศูนย์ข้อมูลเพื่อการช่วยเหลือผู้ประสบอุทกภัย
www.thaiflood.com
#Thaiflood
Powered by
Google Crisis Response


แผนที่วิกฤตการณ์น้ำท่วมประเทศไทย 2554
วิกฤตการณ์น้ำท่วมประเทศไทย 2554
Google Crisis Response
กสทช.
สายด่วน 1200
1111
1784
1669
1146
1193
1690
ประกาศรับอาสาสมัคร ช่วยเหลือเหตุอุทกภัย !!


EGA
ศูนย์รวมข้อมูลอุทกภัยไทย
Thai Flood Information Portal
Articles
twitter

Mash-up and link

Picasa Photo Album

Source: Japan Embassy

2

Source: Bangkok Metropolitan Administration


2


Thailand Floods 2011 Maps
Thailand Floods 2011
This map is no longer being actively updated. Last update 11 Dec 2011.
Severe flooding occurred during the 2011 monsoon season in Thailand, most significantly in the Chao Phraya but also in the Mekong River basin. Beginning in late July and continuing for over two months. The floods have caused 506 reported deaths by early November[1], affected over 2.3 million people, and caused damages estimated at up to 158.7 billion baht (5.1 billion USD) as of 18 October. Source: Wikipedia
Satellite imagery - 2011-11-12
Zoom to area
Severely affected area: Urgent help needed
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Google Crisis Response

Thank you

Loei Province and the Distribution of Disaster Information in the Loei River Basin

Adisorn Suntrarak

LOEI PROVINCE AND THE DISTRIBUTION OF DISASTER INFORMATION IN THE LOEI RIVER BASIN

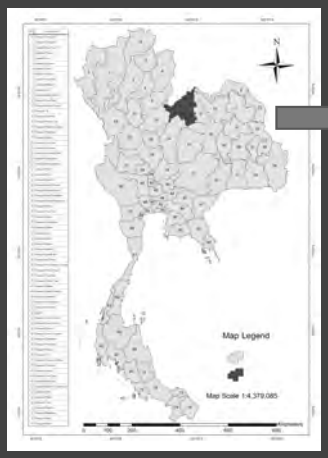
Adisorn Suntrarak
Loei Fund for Nature Conservation and Sustainable Development

ABSTRACT

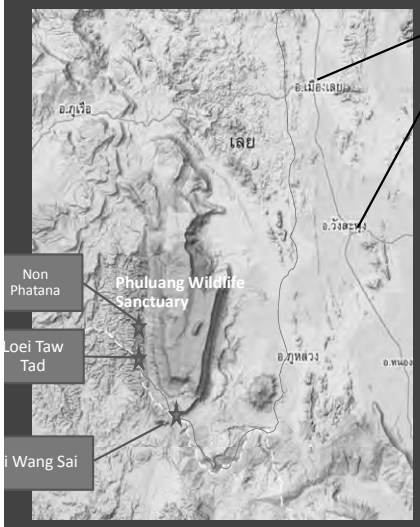
Loei province locates in northeast of Thailand. This province has specific characteristic topography and ethnic population. For the topography, the province has different elevations where lowest point is 150 meters and the highest is 1,560 meters from the sea level. This different elevation causes wild-flood and landslide disasters in rainy season. Baan Non Phathana, Baan Loei Taw Tad and Baan Loei Wang Sai are fountainhead village of the Loei River. These villages have experiences with those disasters. In the past, local people have indigenous knowledge to forecast wild-flood and other disasters such as wind, drought and wild-fire. Presently, even through communication and media technologies are being developed, local people in these villages has not much ways to receive information concerns with disaster reports and warning system due to weak in communication system and management.

Loei Province and Distribution of Disaster Information in Loei River Basin

Adisorn Sunthararuk
Loei Fund for Nature Conservation and Sustainable Development



Northeast of Thailand, The province of mountain, 1815-180 Meters from the see level, the Loei River Basin



Municipality of Loei

Municipality of Wang Saphung

616,744 people, 56 persons per sq.km

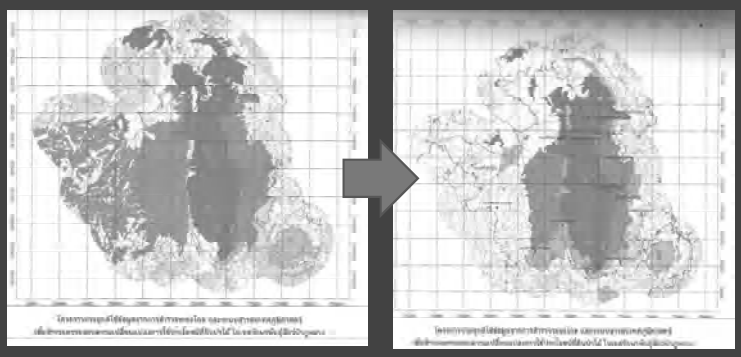
- High biodiversity
- Ore resources
- Thai Loei 80%
- Thai Tai 20%

Places	Loei River	Municipality of Loei	Loei Wang Sai Sub-district	Phuluang Wildlife Sanctuary
elevation	180 Meters	245 Meters	500 Meters	1500 Meters
Activities		Rice, mining, municipality	Maize , dry rice, cassava	Hill Evergreen Forest, Dry Evergreen Forest
Disaster	Flood, drought	Flood, drought, water pollution	Wild-flood, wildfire,	Wildfire
Mobile Signal	Good	Good	weak	Very weak
Radio	Good	Good	weak	weak

Framer: Rice, Maize, Rubber Tree, 240,000 Baht/year

Since 1960s, patterns of agriculture have been changed

Self-sufficiency agriculture to mono crop, chemical, tractor



Amount of forest lands were encroached rapidly, 1976-2005

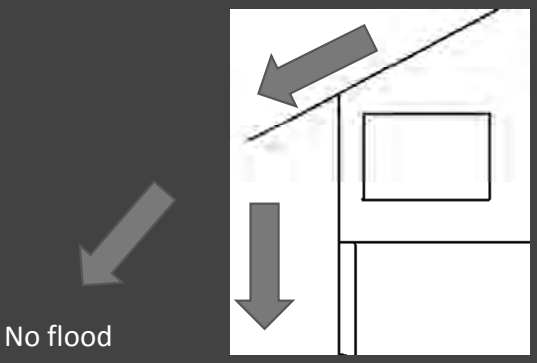
Mining industry is growing up 200% in 2007-2010

Great flood
in 1977, 2002, 2011

wildfire, water pollution, people's conflict

Communication of Rain Fall and Meteorology System

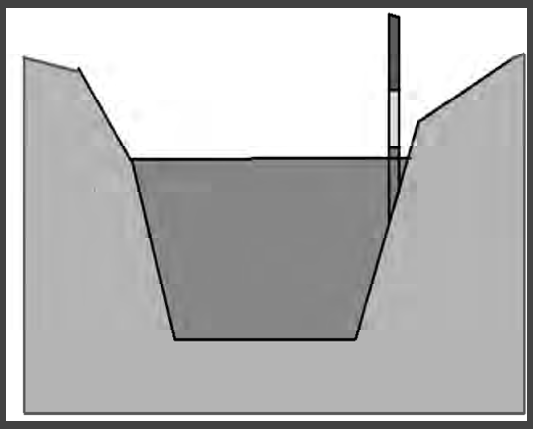
Indigenous Flood Prediction



No flood

Going to be flood

Using bamboo scale



Community Spirit, animal's instinct

Problem of Disaster Information Extension

•Weak of people's participation in information distribution and decision making
•Weak of communication ways in high land areas such as cell-phone signal, local radio
•Weak of sharing information between government agencies, NGOs

Future Plan of Disaster Prevention

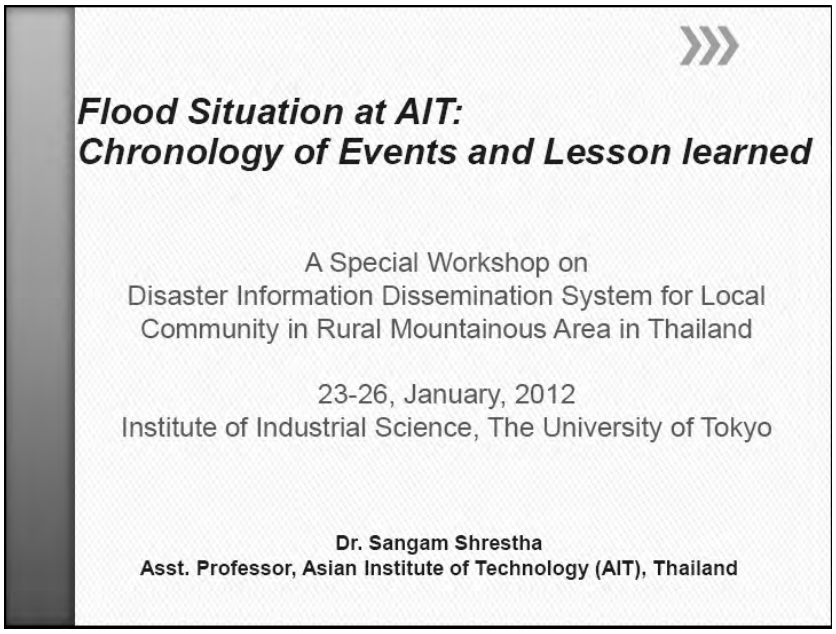
- Community radio
- Walkie-talkie radio network
- Cell phone network
- People's network for disaster presentation
- Cooperation between Go and NGO agencies
- Appropriate tools of sharing disaster information

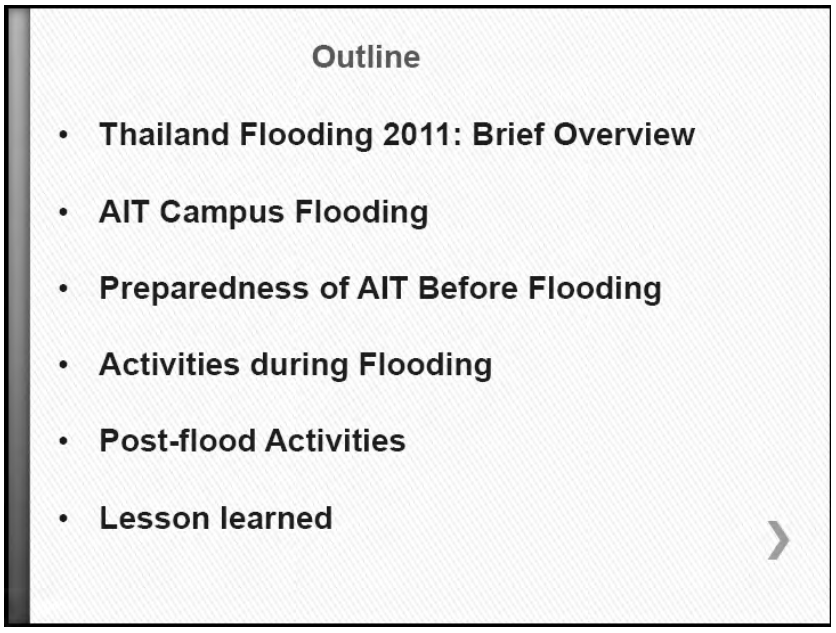
Flood Situation at AIT: Chronology of Events and Lesson Learned

Sangam Shrestha

FLOOD SITUATION AT AIT: CHRONOLOGY OF EVENTS AND LESSON LEARNED

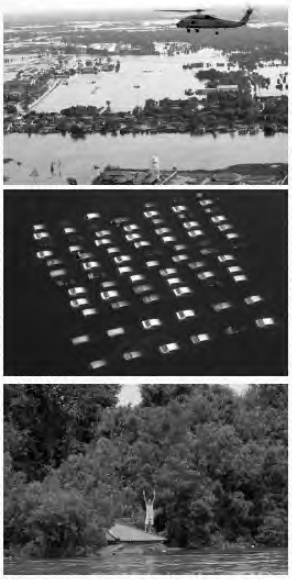
Sangam Shrestha
Asian Institute of Technology (AIT)





Thailand Flooding 2011

- Historical flooding after 1995
- Flooding in 2011 began in July until December
- World Bank estimate this as fourth costliest disaster after Tsunami (Japan), Kobe Earthquake (Japan), Hurricane Katrina (USA)

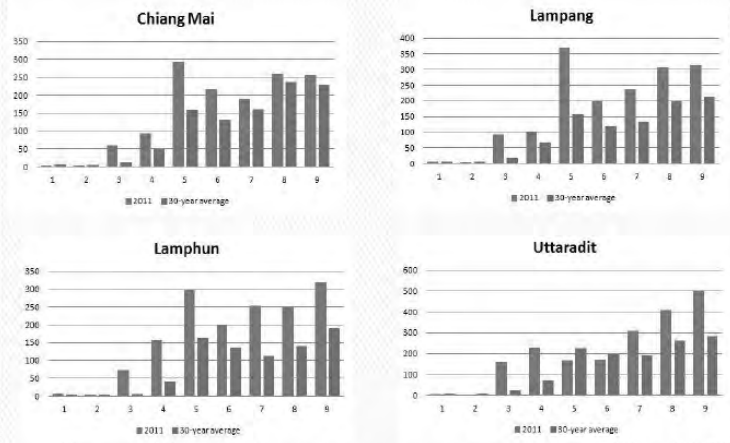


Thailand Flooding 2011

- More than 12.8 million people affected
- World Bank estimated damages reached 1,440 billion baht (US$45 billion) as of December, 2011
- Flooding inundated about six million hectares of land, over 300,000 hectares of which is farmland, in 58 provinces
- Seven major industrial estates were inundated by as much 3 meters (10 feet)

Thailand Flooding 2011

- Thailand has tropical savanna climate
- Rainfall for March (2011) over the area of northern Thailand was an extraordinary 344% above the mean.
- In Chiang Mai the nine-month total was 140% ; in Lamphun 196%; in Lampang 177%; and in Uttaradit 153% as compared to 30 year average of these locations showing 2011 has been an exceptionally wet year and that this has been widely spread across the Chao Phaya catchment.



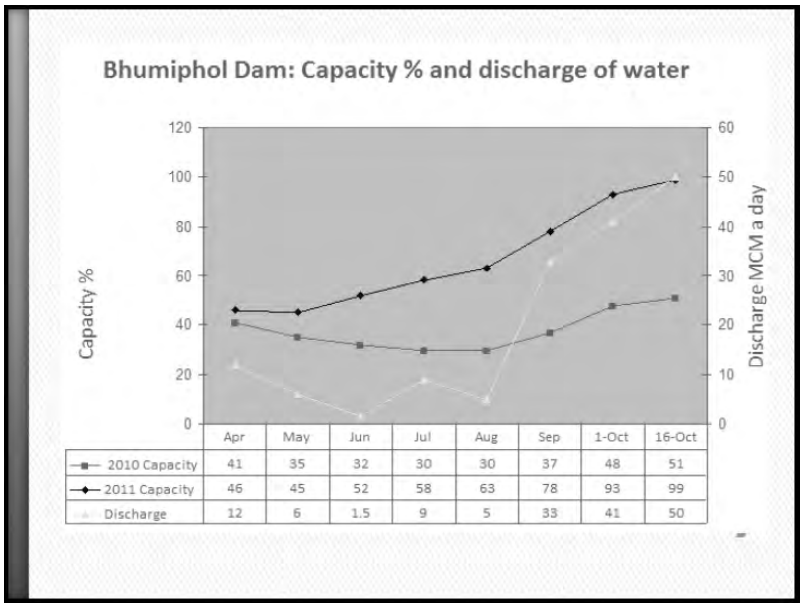
2011 monthly totals rainfall of some provinces (January to September) with the 30-year averages for those months (Thai Meteorological Department, 2011)

Thailand Flooding 2011

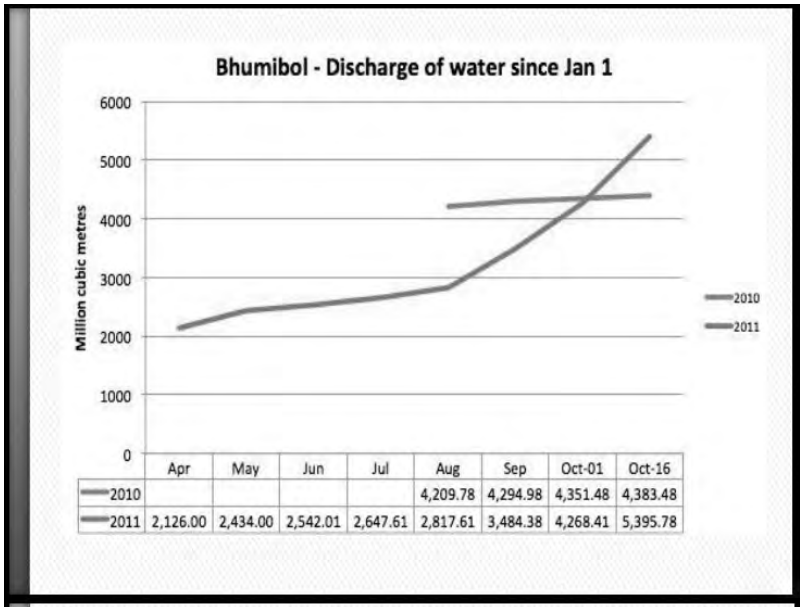
- In June and July (2011), authorities released an average of 4.5 million cubic meters of water per day from Bhumibol Dam as the water level increased to 63 percent of capacity, double the amount stored in the same period a year earlier (2010).
- The discharge increased to 22 million cubic meters per day on average in August and 26 million in September.
- From Oct. 1 to Oct. 14, as floods left hundreds of thousands scrambling for temporary shelter, an average of 77 million cubic meters has been released downstream each day, more than 17 times as much as in June and July.

Thailand Flooding 2011

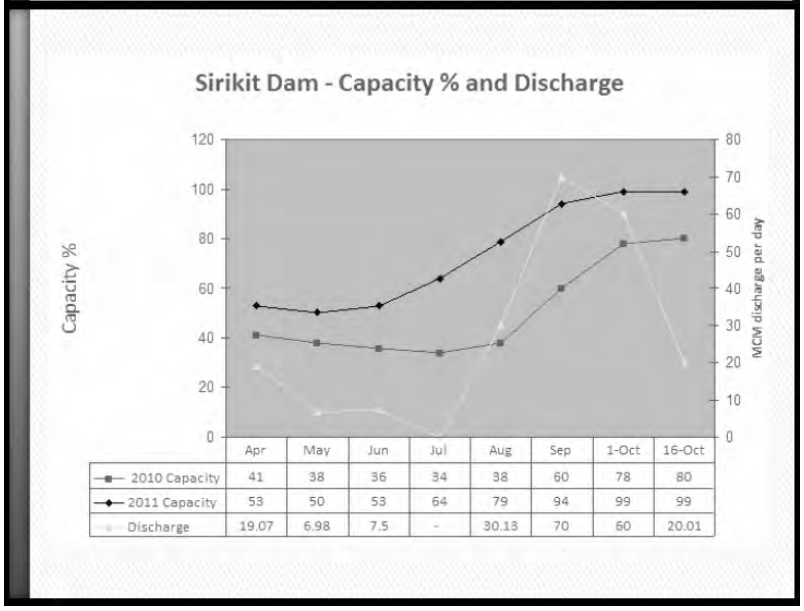
- In Sirikit Dam, the country's second-largest that feeds the flooded area, discharge rates averaged 54 million cubic meters per day from Aug. 1 to Oct. 14, five times more than in June and July, according to Irrigation Department data. On Aug. 1, the reservoir was 79 percent full, holding twice as much water as the same date a year earlier.



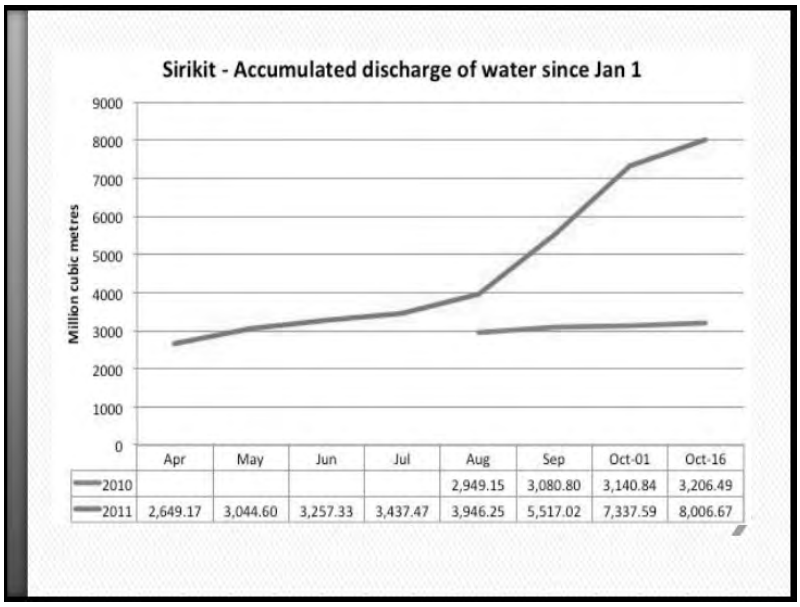
	Apr	May	Jun	Jul	Aug	Sep	1-Oct	16-Oct
2010 Capacity	41	35	32	30	30	37	48	51
2011 Capacity	46	45	52	58	63	78	93	99
Discharge	12	6	1.5	9	5	33	41	50



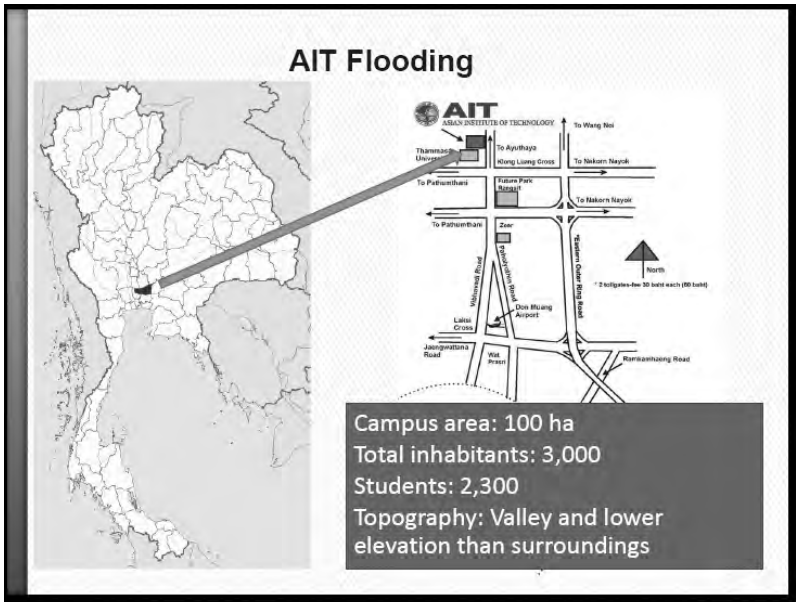
	Apr	May	Jun	Jul	Aug	Sep	Oct-01	Oct-16
2010					4,209.78	4,294.98	4,351.48	4,383.48
2011	2,126.00	2,434.00	2,542.01	2,647.61	2,817.61	3,484.38	4,268.41	5,395.78

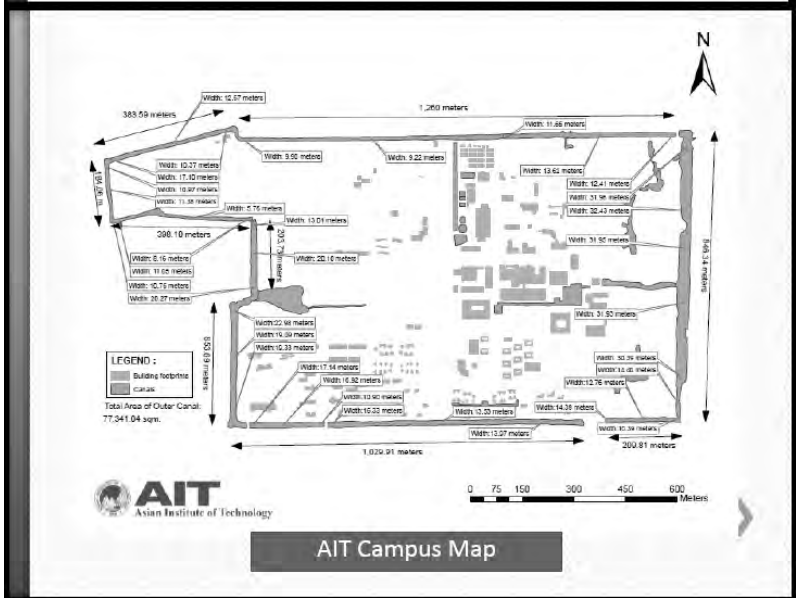


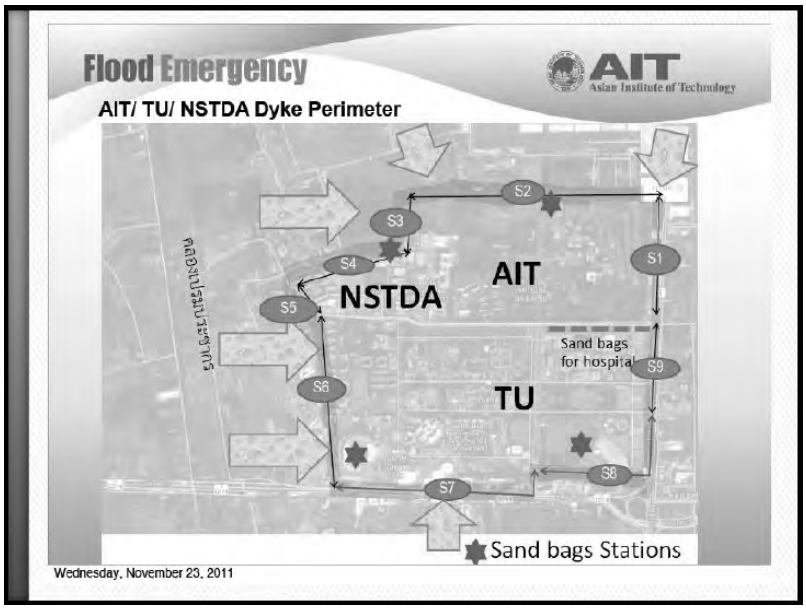
	Apr	May	Jun	Jul	Aug	Sep	1-Oct	16-Oct
2010 Capacity	41	38	36	34	38	60	78	80
2011 Capacity	53	50	53	64	79	94	99	99
Discharge	19.07	6.98	7.5	-	30.13	70	60	20.01



	Apr	May	Jun	Jul	Aug	Sep	Oct-01	Oct-16
2010					2,949.15	3,080.80	3,140.84	3,206.49
2011	2,649.17	3,044.60	3,257.33	3,437.47	3,946.25	5,517.02	7,337.59	8,006.67







AIT Flood Preparedness

Before flooding on 21 October

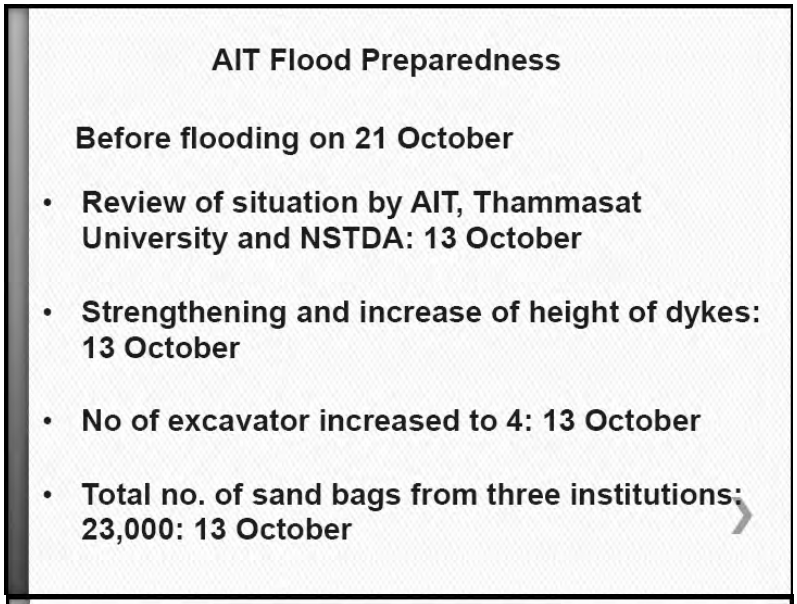
- **First warning to AIT community: 06 October**
- **Dykes reinforcement and water level monitoring: 06 October onwards (40 Sodexo Staff standby)**
- **Formation of 'AIT Flood Emergency Group' chaired by AIT President and issuance of preparedness advice : 11 October**

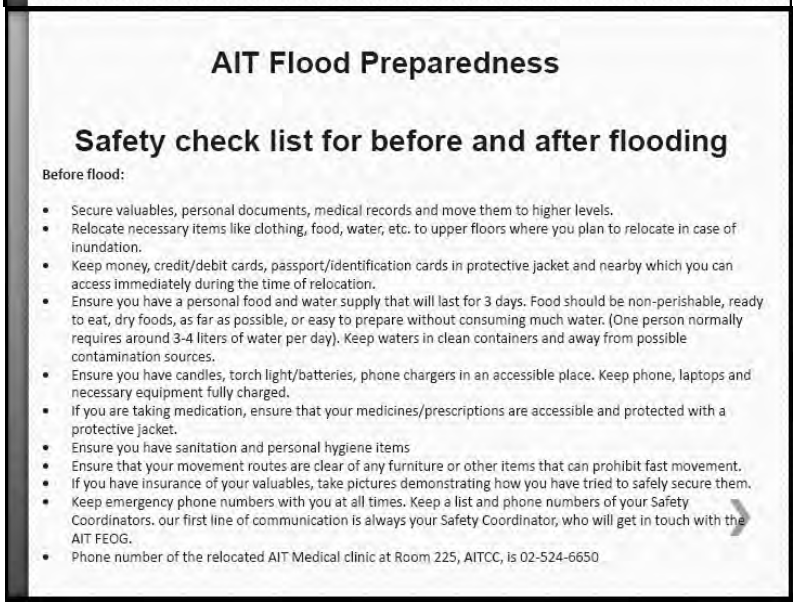
AIT Flood Preparedness

Preparedness advice/instruction issued by AIT President

- During this period, when some events could be very unpredictable, we urge parents to be extra watchful of their children so that they are reachable at all times, most especially in the event of an evacuation.
- With the possibility of power outages, everyone is encouraged to have a good supply of candles and dry cells.
- Everyone is also encouraged to stock on basic food necessities in the event that roads or shops will not be readily accessible. Sodexo is trying its utmost to continue its operations of the Cafeteria and AIT Center Dining Room.
- While we have arranged for additional security control during this period, it is also important that everyone is cautious of any safety or security issue, which should be reported immediately to the AIT Flood Emergency Operations Group.

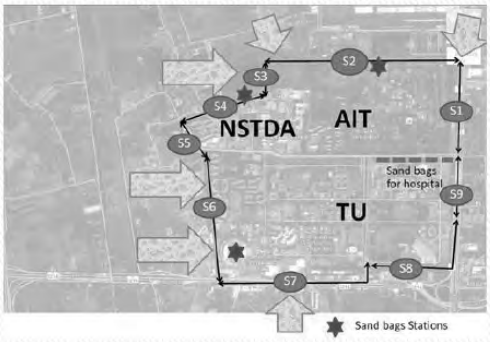

AIT Flood Preparedness
Before flooding on 21 October
• Declaration of holiday from 14-17 October: 12 October
• Communication channel: aitemergency@ait.asia and aitemergency@gmail.com
• Formulation of backup plans and standard procedures: 12 October


AIT Flood Preparedness
Before flooding on 21 October
• Review of situation by AIT, Thammasat University and NSTDA: 13 October
• Strengthening and increase of height of dykes: 13 October
• No of excavator increased to 4: 13 October
• Total no. of sand bags from three institutions: 23,000: 13 October


AIT Flood Preparedness
Safety check list for before and after flooding
Before flood:
• Secure valuables, personal documents, medical records and move them to higher levels.
• Relocate necessary items like clothing, food, water, etc. to upper floors where you plan to relocate in case of inundation.
• Keep money, credit/debit cards, passport/identification cards in protective jacket and nearby which you can access immediately during the time of relocation.
• Ensure you have a personal food and water supply that will last for 3 days. Food should be non-perishable, ready to eat, dry foods, as far as possible, or easy to prepare without consuming much water. (One person normally requires around 3-4 liters of water per day). Keep waters in clean containers and away from possible contamination sources.
• Ensure you have candles, torch light/batteries, phone chargers in an accessible place. Keep phone, laptops and necessary equipment fully charged.
• If you are taking medication, ensure that your medicines/prescriptions are accessible and protected with a protective jacket.
• Ensure you have sanitation and personal hygiene items
• Ensure that your movement routes are clear of any furniture or other items that can prohibit fast movement.
• If you have insurance of your valuables, take pictures demonstrating how you have tried to safely secure them.
• Keep emergency phone numbers with you at all times. Keep a list and phone numbers of your Safety Coordinators. our first line of communication is always your Safety Coordinator, who will get in touch with the AIT FEOG.
• Phone number of the relocated AIT Medical clinic at Room 225, AITCC, is 02-524-6650

AIT Flood Preparedness

- Set up of defense line between AIT, Thammsat University and NSTDA: 16 October



AIT Flood Preparedness

Before flooding on 21 October

- Open forum: 17 October
- No of buses increased to 17: 17 October
- *Dykes breached and fixed: Night of 19 October*
- Addition of pumps (5) and operating at full capacity: 20 October

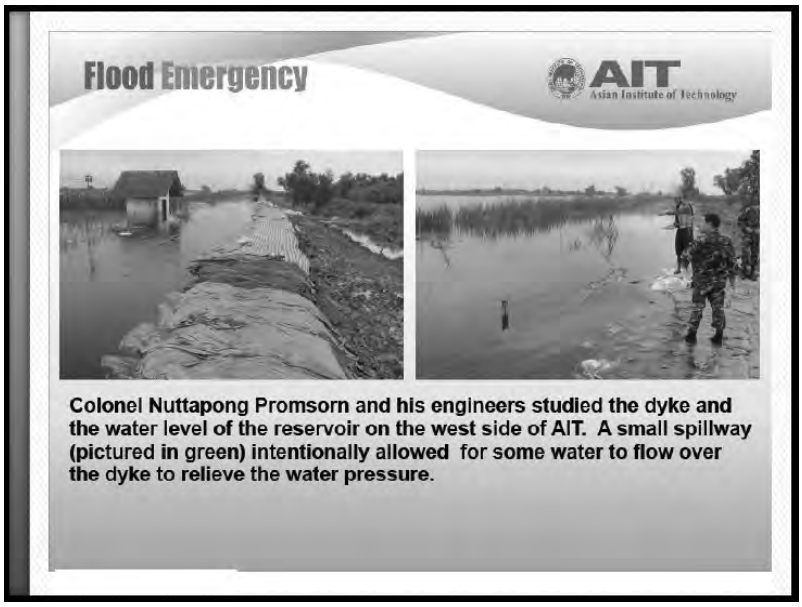
Flood Emergency

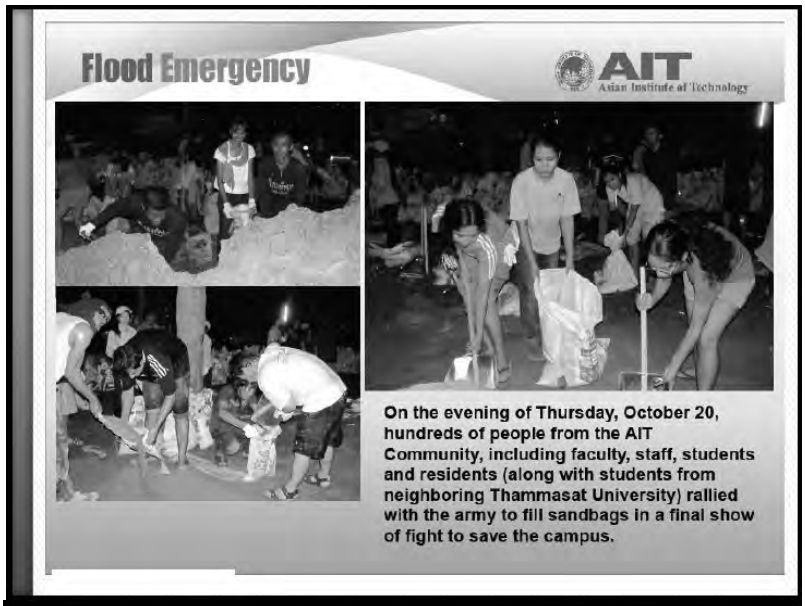
AIT Asian Institute of Technology

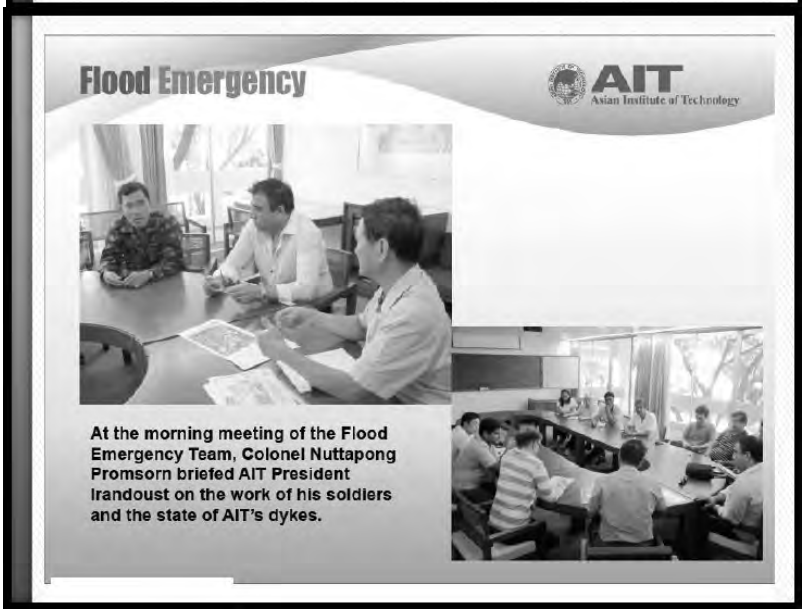
The Royal Thai Army's 202 Engineer Battalion (based in Nakorn Rachasima), arrived at AIT on the afternoon of October 19.

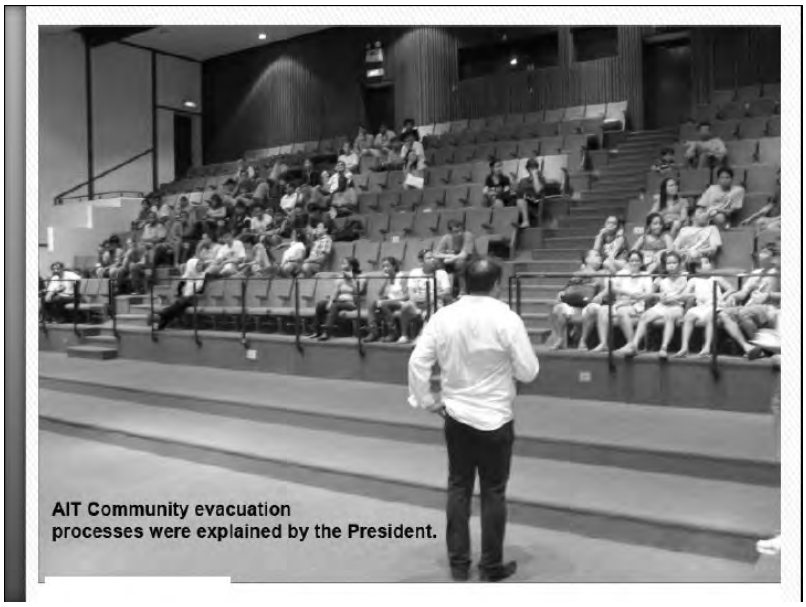
Commanding officer Colonel Nuttapong Promsorn *(pictured)* met with the AIT Flood Emergency Team on the morning of Thursday, October 20 to plan a united defense.

The battalion of 170 soldiers worked for two days to fix a breach in the dyke system protecting the campus.

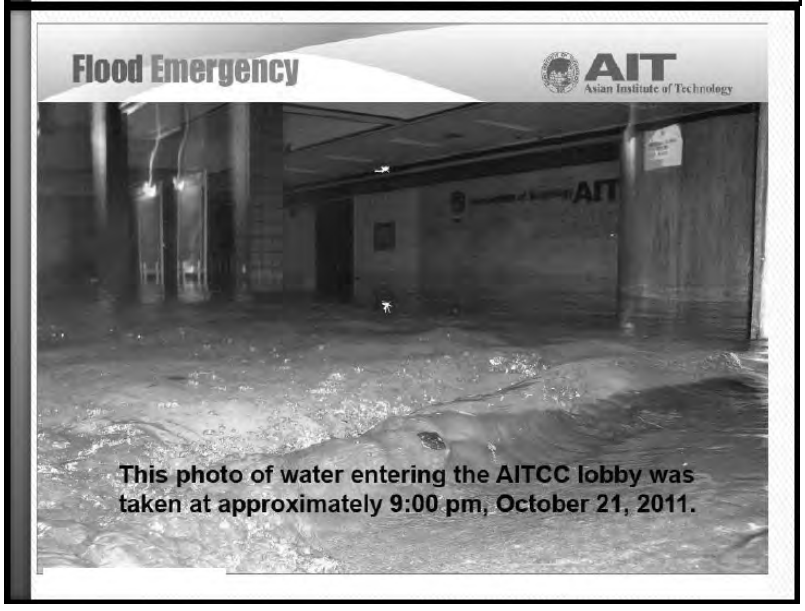

Flood Emergency
AIT
Asian Institute of Technology
Colonel Nuttapong Promsorn and his engineers studied the dyke and the water level of the reservoir on the west side of AIT. A small spillway (pictured in green) intentionally allowed for some water to flow over the dyke to relieve the water pressure.

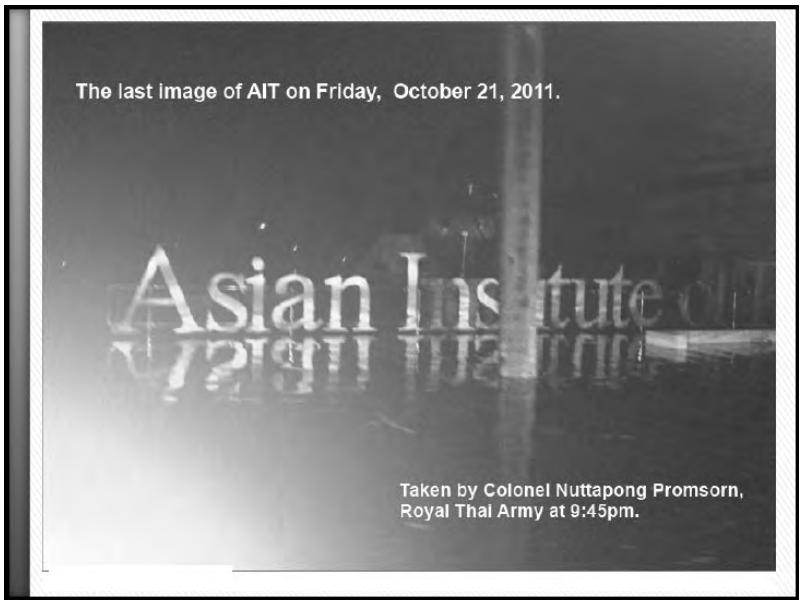

Flood Emergency
AIT
Asian Institute of Technology
On the evening of Thursday, October 20, hundreds of people from the AIT Community, including faculty, staff, students and residents (along with students from neighboring Thammasat University) rallied with the army to fill sandbags in a final show of fight to save the campus.


Flood Emergency
AIT
Asian Institute of Technology
At the morning meeting of the Flood Emergency Team, Colonel Nuttapong Promsorn briefed AIT President Irandoust on the work of his soldiers and the state of AIT's dykes.

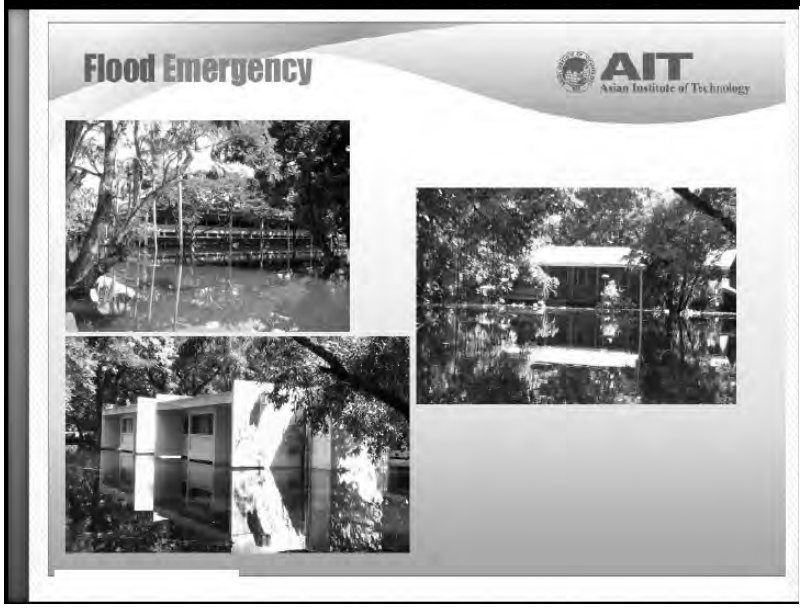

AIT Community evacuation
processes were explained by the President.

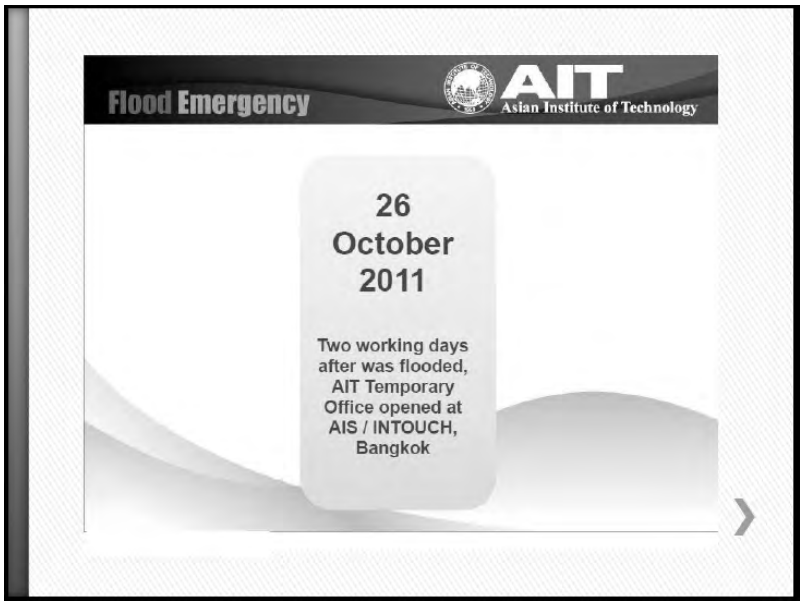

People began to congregate at the AITCC.

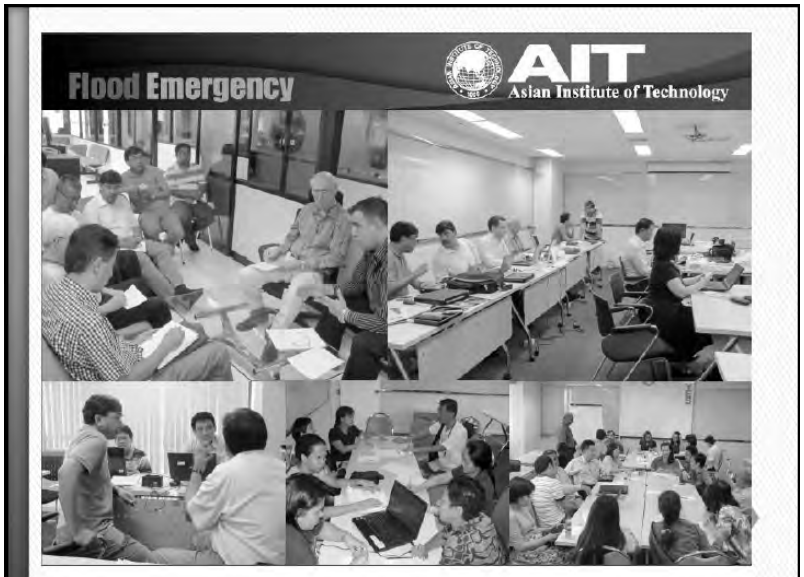

Flood Emergency
AIT
Asian Institute of Technology
This photo of water entering the AITCC lobby was
taken at approximately 9:00 pm, October 21, 2011.

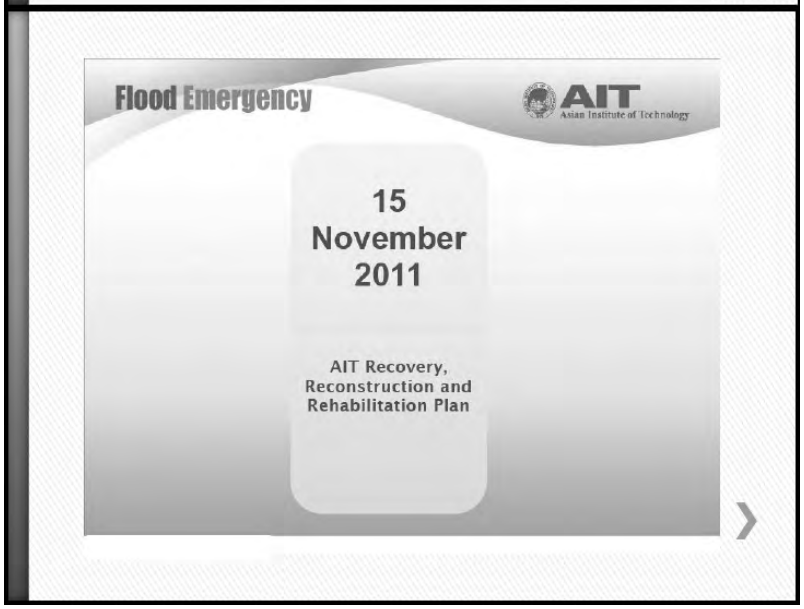

The last image of AIT on Friday, October 21, 2011.
Asian Institute
Taken by Colonel Nuttapong Promsorn,
Royal Thai Army at 9:45pm.


Flood Emergency
AIT
Asian Institute of Technology
22
October
2011
The Day After

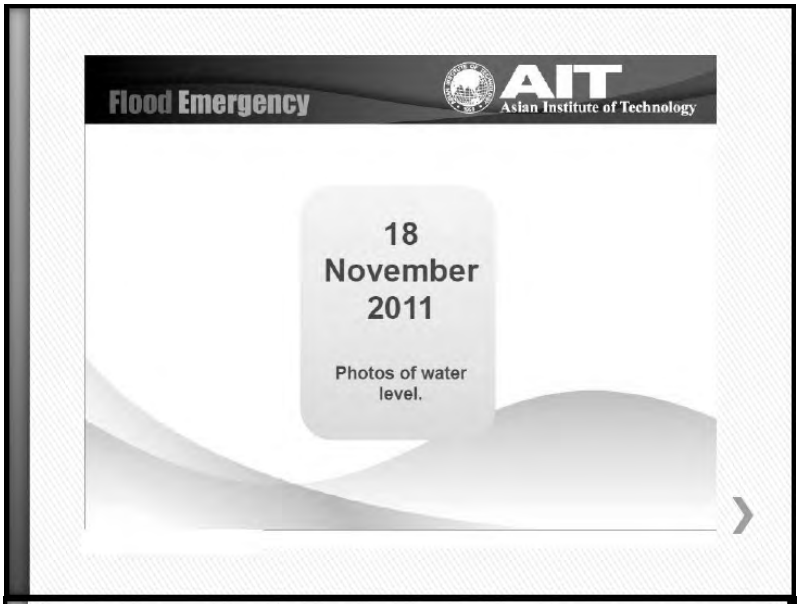

Flood Emergency
AIT
Asian Institute of Technology


Flood Emergency
AIT
Asian Institute of Technology
26
October
2011
Two working days after was flooded, AIT Temporary Office opened at AIS / INTOUCH, Bangkok

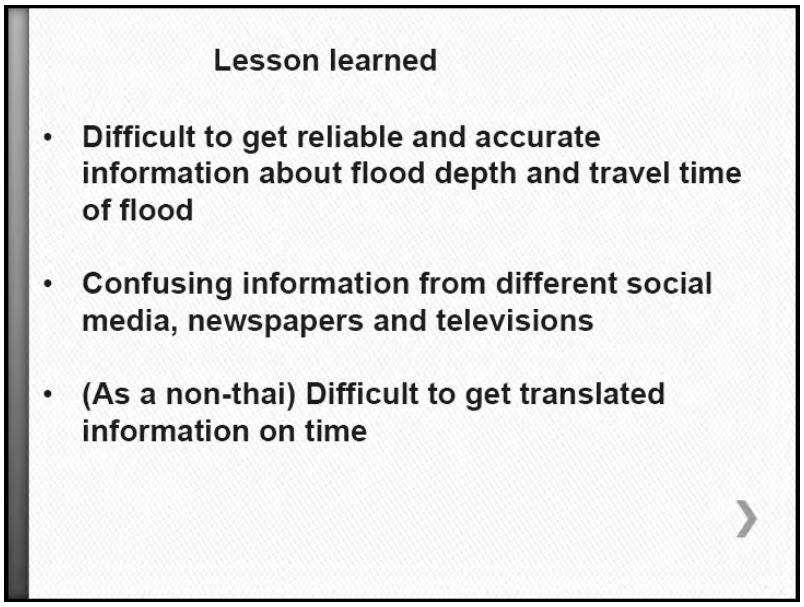

Flood Emergency
AIT
Asian Institute of Technology

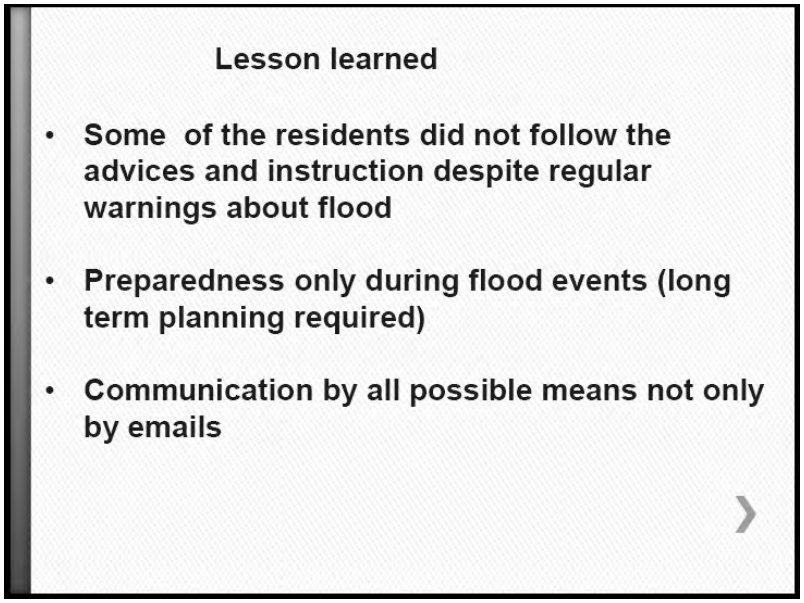

Flood Emergency
AIT
Asian Institute of Technology
15
November
2011
AIT Recovery, Reconstruction and Rehabilitation Plan


Flood Emergency
AIT
Asian Institute of Technology
AIT


Flood Emergency
AIT
Asian Institute of Technology
18
November
2011
Photos of water
level.


Flood Emergency
AIT
Asian Institute of Technology


Lesson learned
• Difficult to get reliable and accurate information about flood depth and travel time of flood
• Confusing information from different social media, newspapers and televisions
• (As a non-thai) Difficult to get translated information on time


Lesson learned
• Some of the residents did not follow the advices and instruction despite regular warnings about flood
• Preparedness only during flood events (long term planning required)
• Communication by all possible means not only by emails

Typhoon Talas – quick report from Kii Peninsula, Japan

Shinya Kondo

TYPHOON TALAS - QUICK REPORT FROM KII PENINSULA, JAPAN

Shinya Kondo
The University of Tokyo, ICUS

ABSTRACT

On early September, Typhoon Talas caused the record-breaking heavy rainfall over a wide area from western to northern Japan, especially along the mountains. In particular, a wide area of the Kii Peninsula was hit hard. The casualties are 77 people and 18 people are missing. On the southeastern part of the Kii Peninsula, debris flows caused severe damage to mountain settlements along the river. The people who evacuated early survived, but people who delayed their evacuation were swept away by debris flow. Other affected areas were also inundated by river flooding. People had difficulty obtaining information about the rainfall amount and water level of the river.

A Special Workshop on Disaster Information Dissemination System for Local Community in Rural Mountainous Area in Thailand

Typhoon Talas – quick report from Kii Peninsula, Japan

2011/01/23

Shinya Kondo

ICUS, IIS, the University of Tokyo, Japan

Shinya Kondo

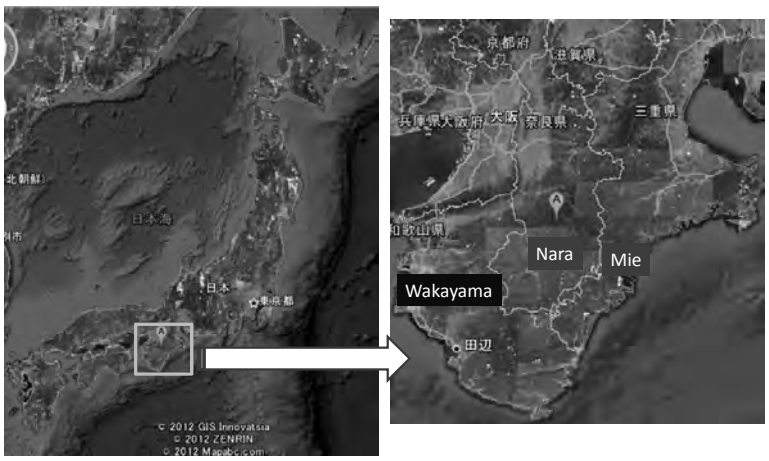
1977	Kodaira, Tokyo, Jpana
Sep., 2005	Ph. D, Department of Civil Engineering, The University of Tokyo
Oct., 2005 – Mar., 2010	Research Scientist, Disaster Reduction and Human Renovation Institution (DRI)
Apr., 2010 -	Project Researcher, ICUS, IIS, The University of Tokyo

Research

- Development of a Support Program for Isolated Districts Focused on Widespread Disaster
- Development of Simulation Exercise of Emergency Response Headquarter Management by Objectives (SEMO)
- Disaster Information Management
- Development of a New Style Disaster Management Manual
- Trend Analysis on Research Field of Academic Society for Disaster Prevention

Mail kondos@iis.u-tokyo.ac.jp

Kii Peninsula (紀伊半島)



Kii Peninsula（紀伊半島）

Mountainous Areas

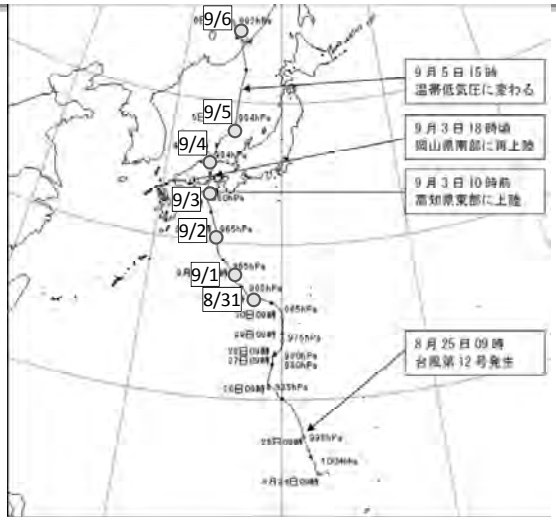
Coastal Areas

Typhoon Talas
（台風１２号豪雨水害）

- On 3 September, Typhoon Talas made landfall on Shikoku Island and reached the Sea of Japan on the next day after crossing Shikoku and Chugoku regions.
- Because Talas had a large scale strong wind area and moved very slowly, it induced moisture advection for many hours and caused the record-breaking heavy rainfall over a wide area from western to northern Japan, especially along the mountains.
- The casualties are 78 people and 16 people are missing.
- Mainly in Kii Peninsula (68 dead, 16 missing).

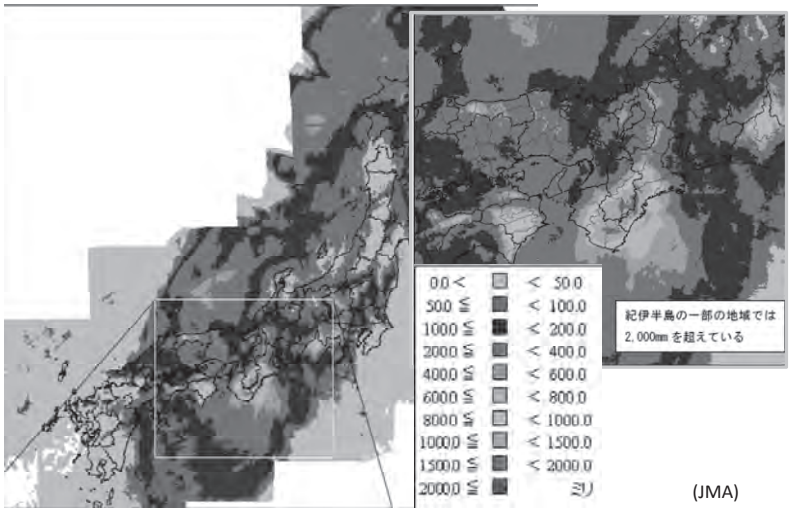
(JMA)

Typhoon route map（経路図）



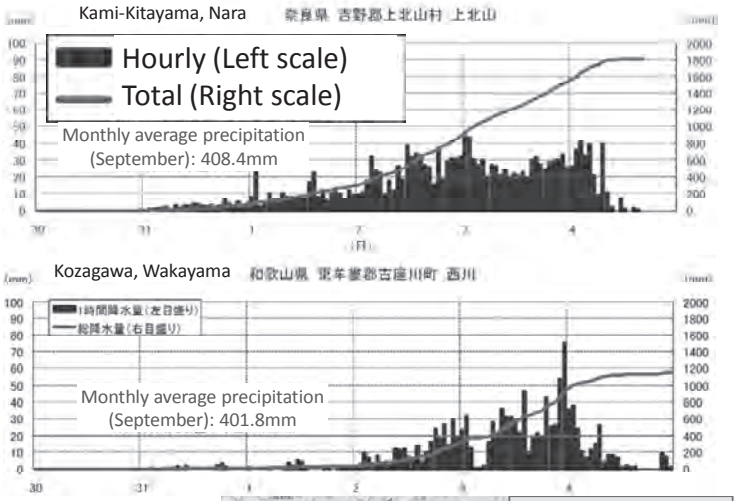
(JMA)

Rain total (8/30 17:00 - 9/6 24:00)
(総降雨量)

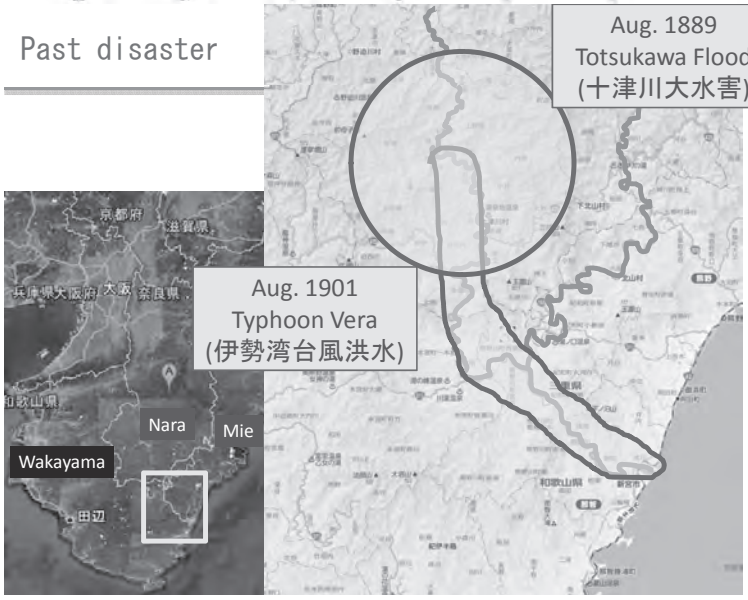


(JMA)

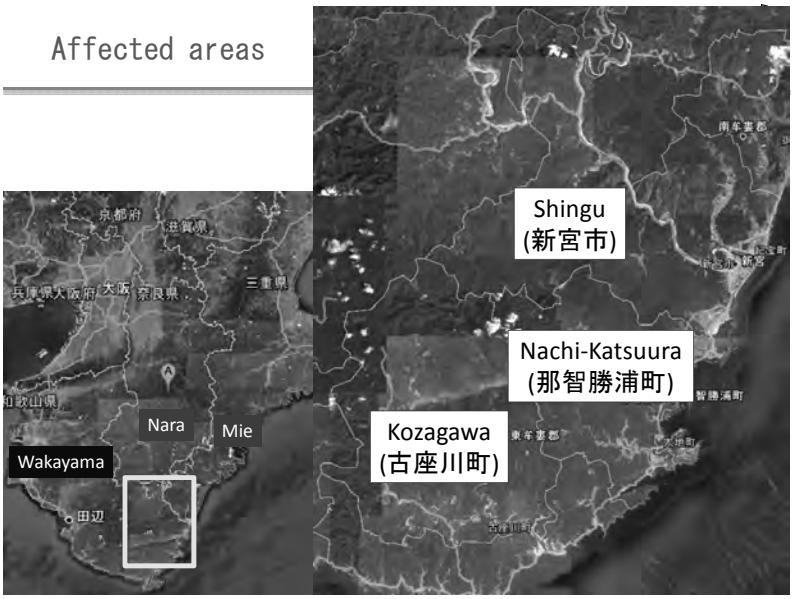
Precipitation(降水量時系列図)



Past disaster

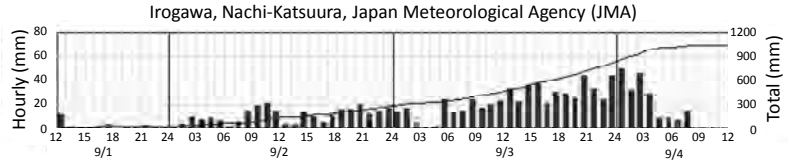


Affected areas



Nachi-Katsuura（那智勝浦町）

Irogawa, Nachi-Katsuura, Japan Meteorological Agency (JMA)



9/2 4:45 Heavy rain and Flood Warning. 大雨洪水警報
9/2 People started to evacuate by themselves in mountain. 山間部で自主避難始まる
9/2 21:50 Landslide warning information. 土砂災害警戒情報
9/3 16:15 Evacuation instructions. 避難勧告
9/3 -18:00 Local government officers prepared evacuation house and road regulation, but someone could not come back to office.
町職員は避難所準備、道路規制（役場に戻れず）
9/4 1:45 Evacuation directives. 避難指示
9/4 1:57 People evacuated in some evacuation house moved to other evacuation house.
ある避難所が危険な状態だと判断して別の避難所に移る
9/4 3:15 Phone interruption. 電話不通
9/4 4:30 Flood the entire area. 町内全域冠水

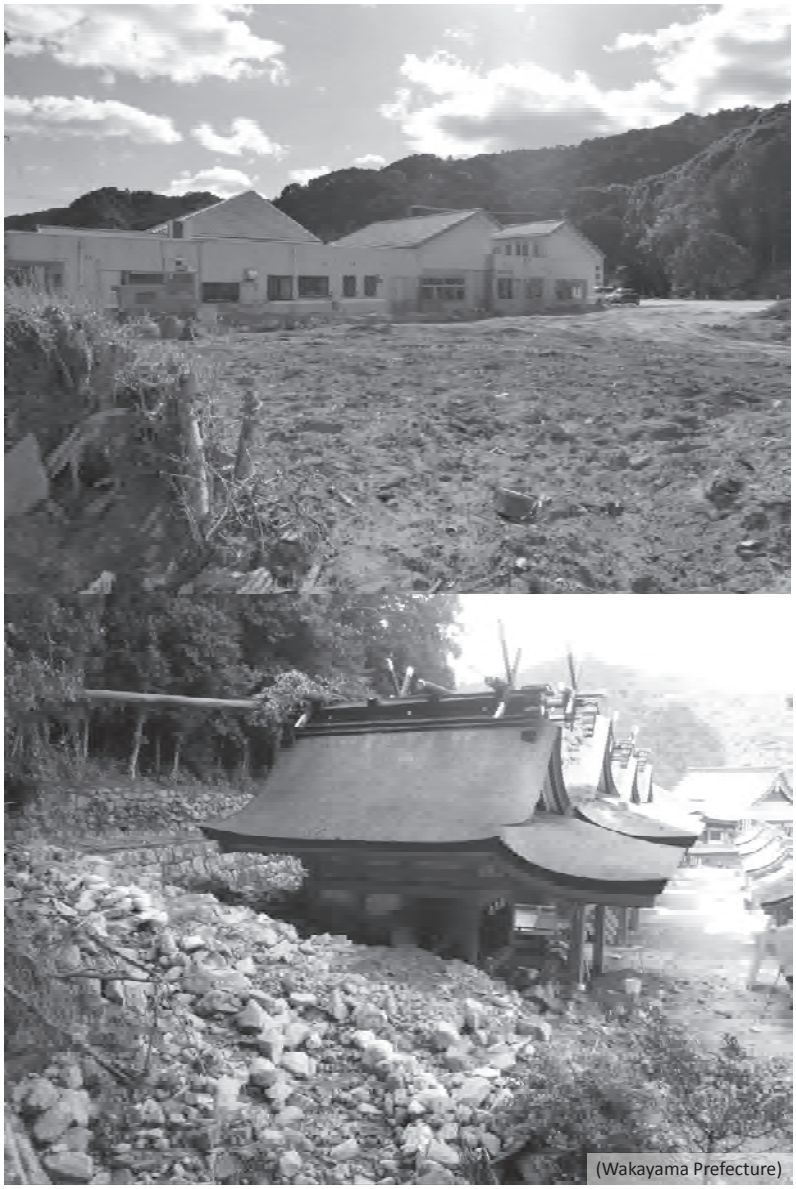
Nachi-Katsura（那智勝浦町）

(Wakayama Prefecture)

(Wakayama Prefecture)


(Wakayama Prefecture)


(Wakayama Prefecture)



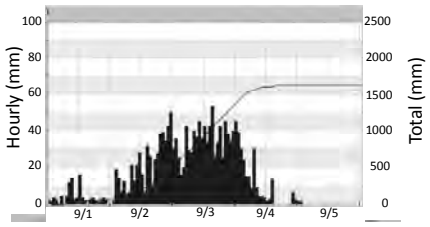
(Wakayama Prefecture)

Nachi-Katsuura（那智勝浦町）

- Most of causes of death were swept away by debris flow.
  - 亡くなった人の多くは、土石流に流されたことによるものである。
- There was a possibility to increase victims, if people didn't move to other evacuation house.
  - 住民の判断で避難所を移動しなければ、犠牲者はより増えていた可能性がある。
- After 9/4 3:15, it was difficult to contact with evacuation house because of phone interruption.
  - 9/4 3:15以降、電話が不通になり避難所との連絡ができなくなった。
- Local government officer could not use independent wireless network.
  - 防災無線も使えなくなった（時期は不明）。
- People didn't recognize disaster risk. (From radio program)
  - 住民は、災害が起こるとは思っていなかった。（ラジオ番組でのインタビュー）

Shingu（新宮市）

Koguchi, Shingu, Ministry of Land, Infrastructure, Transport and Tourism (MLIT)



9/2 4:45 Heavy rain and Flood Warning. 大雨洪水警報
9/2 11:45 Landslide warning information. 土砂災害警戒情報
9/2 19:00 The water level of the river rose over bank height in the mountain.
山間部で川の水位が堤防高を越える
9/2 20:40 Evacuation instructions in the mountain. 避難勧告（山間部）
9/3 – 9/7 Fixed-line phone interruption (mobile phone in the mountain).
固定電話が不通（山間部は携帯電話も）
9/4 – 9/26 Japan Self-Defense Forces started support activity. 自衛隊による支援活動

Shingu（新宮市）

(youtube: adandyinaspic1)

(Wakayama Prefecture)

(Wakayama Prefecture)

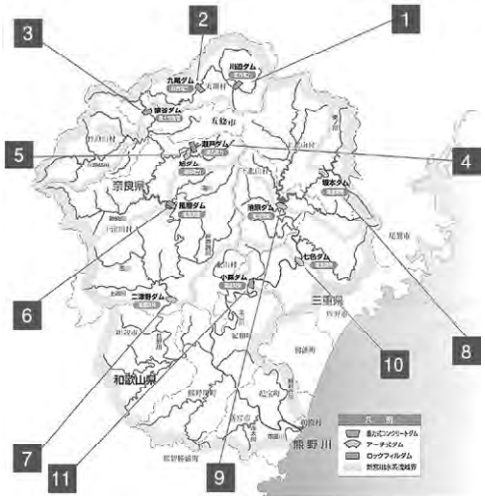
(Wakayama Prefecture)

Miwa bridge（三和大橋）

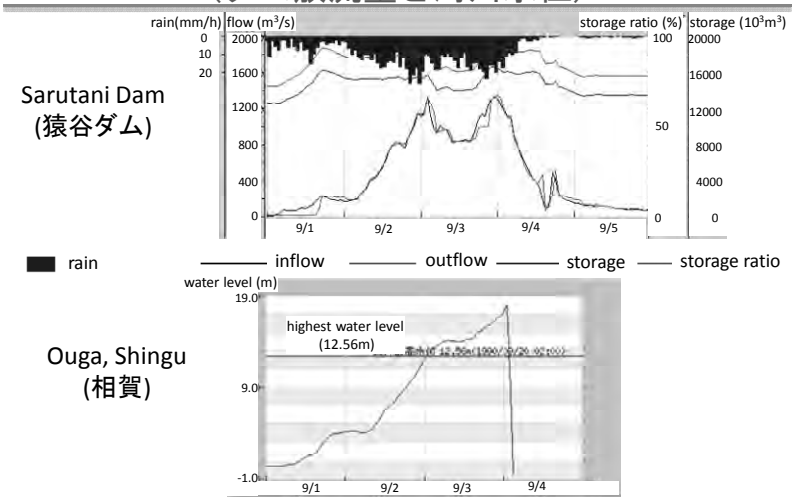
(Paronamio)

(Wakayama Prefecture)

Dams are not for flood-control
（治水目的のダムがない）



Outflow of dam and water level of river
（ダム放流量と河川水位）



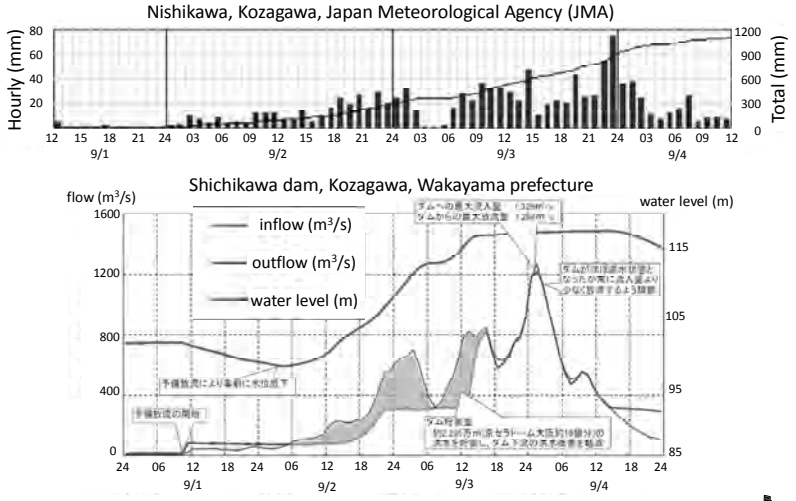
Shingu（新宮市）

- Outflow was estimated to equal inflow in the morning of 9/2 because of no flood control dam and no storage.
  - 治水目的のダムがなかったため、貯水量に余裕がなく、9/2の朝にはダムの流入量＝放流量となったと推定される。
- There had flood in the mountain in the evening of 9/2 with continuous heavy rain.
  - 降り続く大雨により、9/2の午後には山間部で浸水が始まったと推定される。
- Local government knew the information about discharge from dam.
  - ダムからの放流に関する情報は市役所に伝えられていた。（3000t/s以上で1時間に1回）

Shingu（新宮市）

- People couldn't use fixed-line phone. In the mountain, people couldn't use mobile phone, cable TV, radio service, and independent wireless network.
  - 固定電話が使えず、山間部では携帯電話、ケーブルテレビ、ラジオ、防災無線が使えなかった。
- In the mountain, people couldn't get the information about heavy rain and water level including information from local government.
  - 山間部の住民は、市役所からの情報を含めて、大雨や川に関する情報を入手することができなかった。
- In the mountain, people recognized disaster risk and could react with the amount of rain and water level.
  - 山間部の住民は、災害リスクを認識しており、降雨量と河川の水位情報があれば、対応できる。

Kozagawa（古座川町）



Kozagawa（古座川町）

- 9/2 4:45 Heavy rain and Flood Warning. 大雨洪水警報
- 9/2 14:30 Voluntary evacuation. Dispatch of officers to each evacuation house. 自主避難開始、各避難所に職員を派遣
- 9/2 21:50 Landslide warning information. 土砂災害警戒情報
- 9/2 22:00 Local government told the leader of region possibilities to issue evacuation instructions in the next morning. 区長に明け方に避難勧告を出す可能性がある旨を連絡
- 9/2 night – 9/3 night Black out. 停電
- 9/3 10:45 The information prepared evacuation. 避難準備情報
- 9/3 16:00 Evacuation instructions. 避難勧告
- 9/3 23:00 Local government got information from dam about outflow equaling inflow. ダムから流入量＝放出量にする連絡を受ける
- 9/4 0:05 Evacuation directives. 避難指示
- 9/4 2:00 Phone interruptions. 電話が不通
- 9/4 8:00 The water was removed. 地域から水が引く

Kozagawa（古座川町）

- Local government were often public relations about possibility of swollen rivers.
  - 河川が増水する可能性がある旨の広報を頻繁にしていた。
- Local government had policies to issue evacuation instructions before it gets dark at the risk of swinging out.
  - 避難勧告は明るいうちに空振りを覚悟で出す方針だった。
- In the night of 9/3, local government officers could not go to evacuation house because of water-covered road.
  - ３日夜には道路浸水のために各避難所に向かうことができなかった。
- Local government often communicated the dam office.
  - ダムとは頻繁に連絡を取っていた。
- It seems that early response before it gets dark was the cause of decrease human suffering.
  - 明るいうちに行った早めの対応が人的被害を軽減できた要因だと考えられる。

Conclusions（まとめ）

- Some areas could not get the information because of phone and TV interruption.
  - 電話、テレビなどが使えず情報を入手できない地域があった。
- People should recognize disaster risk and the limit of the function of the dam, and do something by themselves.
  - 住民が災害リスクとダムの機能の限界について認識し、自らの判断で行動する必要がある。
- Local government needs public relations people can decide before it gets dark at the risk of swinging out.
  - 行政は、住民が明るいときに行動を判断できる情報を空振り覚悟で提供するが必要となる。

Development of Flood Inundation modeling using Sensor Network and OGC Web Services

Sarawut Ninsawat

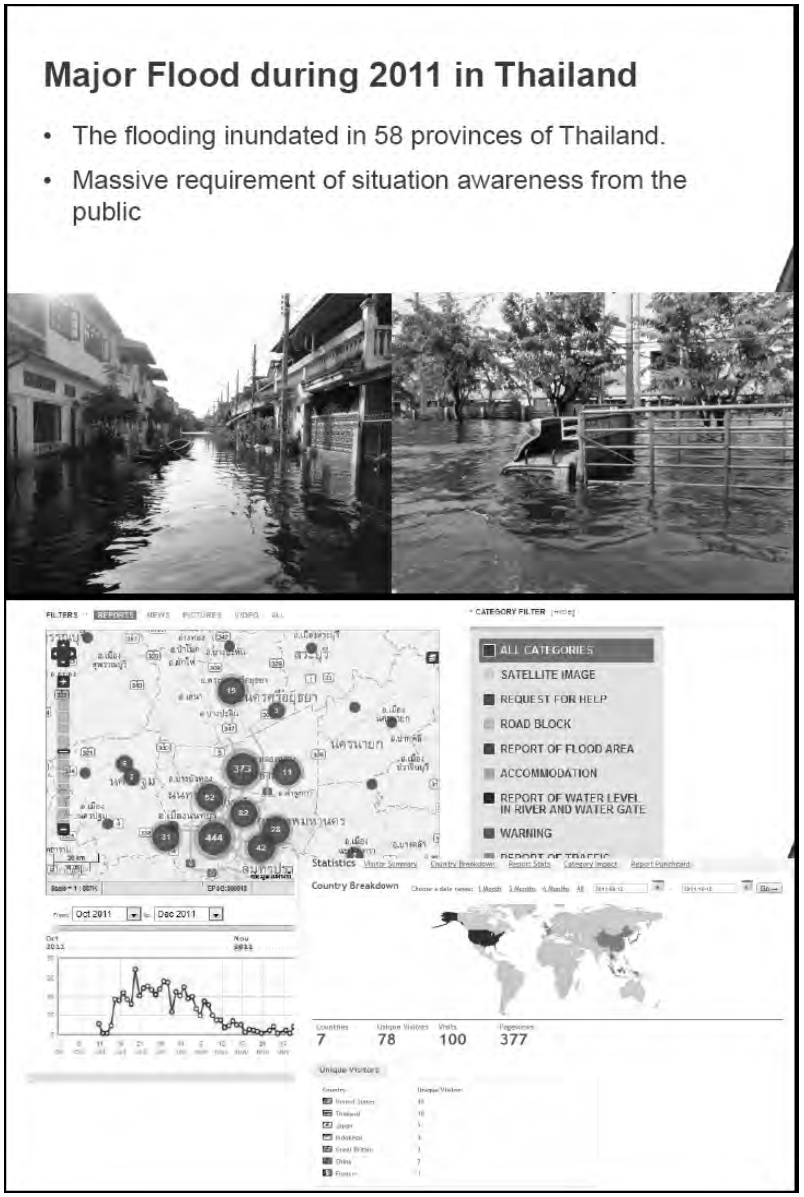
DEVELOPMENT OF FLOOD INUNDATION MODELING USING SENSOR NETWORK AND OGC WEB SERVICES

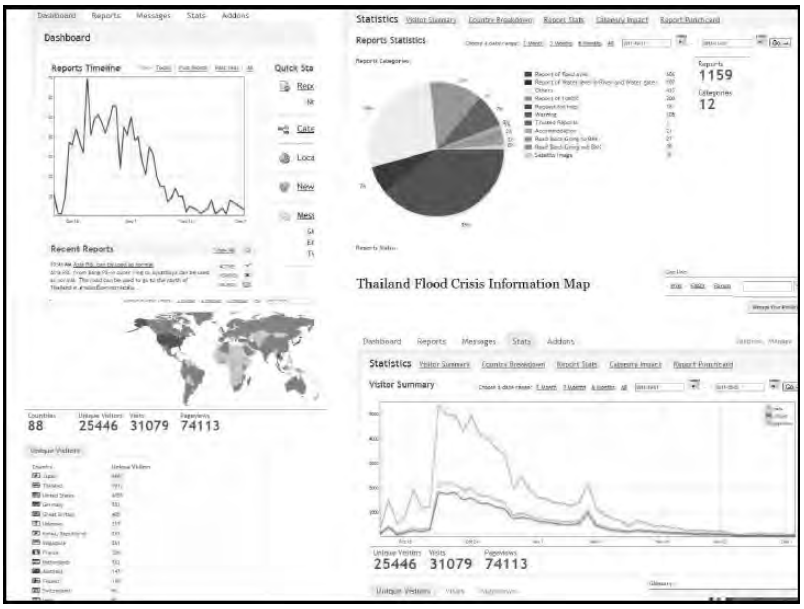
Sarawut Ninsawat
Asian Institute of Technology (AIT)

ABSTRACT

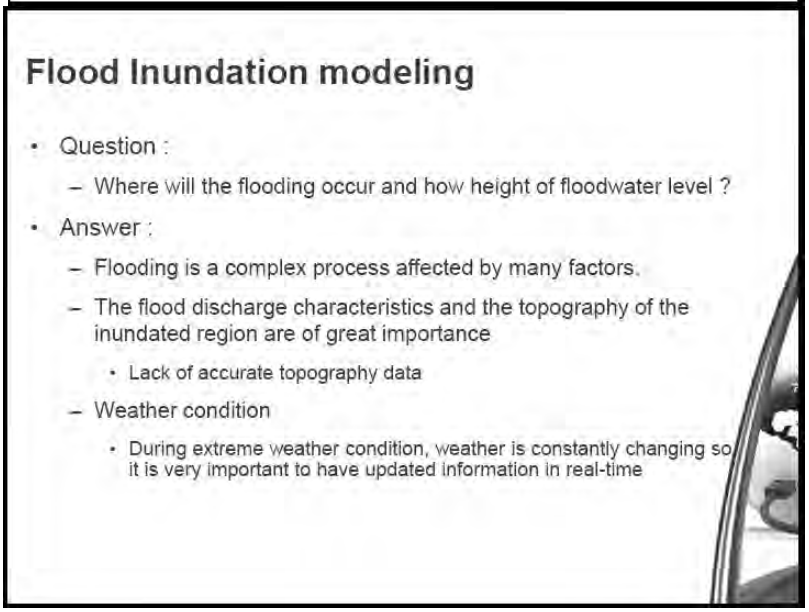
With recent major floods occur during the 2011 in Thailand, there is massive requirement of situation awareness from the public, people want to know where is the heavy rain occurring, where will the flooding occur and how height of floodwater level. Flooding is a complex process affected by many factors in which the flood discharge characteristics and the topography of the inundated region are of great importance. Additionally, during extreme weather condition, weather is constantly changing so it is very important to have updated information in real-time. This study aimed at the development of a near real-time flood inundation modeling using Sensor Network and standard OGC Web Services.


Development of Flood Inundation modeling using Sensor Network and OGC Web Services
By:
Dr. Sarawut Ninsawat
Remote Sensing & Geographic Information Systems (RS&GIS) FoS
School of Engineering and Technology (SET)
Asian Institute of Technology (AIT)
ASIAN INSTITUTE OF TECHNOLOGY
1959


Major Flood during 2011 in Thailand
• The flooding inundated in 58 provinces of Thailand.
• Massive requirement of situation awareness from the public
ALL CATEGORIES
SATELLITE IMAGE
REQUEST FOR HELP
ROAD BLOCK
REPORT OF FLOOD AREA
ACCOMMODATION
REPORT OF WATER LEVEL IN RIVER AND WATER GATE
WARNING
Statistics
Country Breakdown
Countries 7
Unique Visitors 78
Visits 100
Pageviews 377


Dashboard
Reports Timeline
Recent Reports
Countries 88
Unique Visitors 25446
Visits 31079
Pageviews 74113
Statistics
Reports Statistics
Reports 1159
Categories 12
Thailand Flood Crisis Information Map
Visitor Summary
Unique Visitors 25446
Visits 31079
Pageviews 74113


Encourage for Crowd-sourcing by NECTEC
• Training / demonstration for using Crowd-sourcing
– Ushahidi system on Iphone, Ipad, Android and web browsers
• Report of inundated
– Maximum water level photo competition
– Expected 30,000 reports
• Ipad 2 and Black berry for winner
– More if more sponsor
• Tentative schedule start from Feb 1st


Flood Inundation modeling
• Question :
– Where will the flooding occur and how height of floodwater level ?
• Answer :
– Flooding is a complex process affected by many factors.
– The flood discharge characteristics and the topography of the inundated region are of great importance
• Lack of accurate topography data
– Weather condition
• During extreme weather condition, weather is constantly changing so it is very important to have updated information in real-time

Sensor Network

- With the prices of networkable sensing devices dropping.
  - the volume of information begin collected by networked sensors has increased dramatically in recent years.
- In "The Economist" argued that in coming years communications chips will embedded in a host of everyday objects,
  - which are able to communicate with other devices, serviced and upgraded remotely through computer networks.

Real-time Data Acquisition System

PICNIC

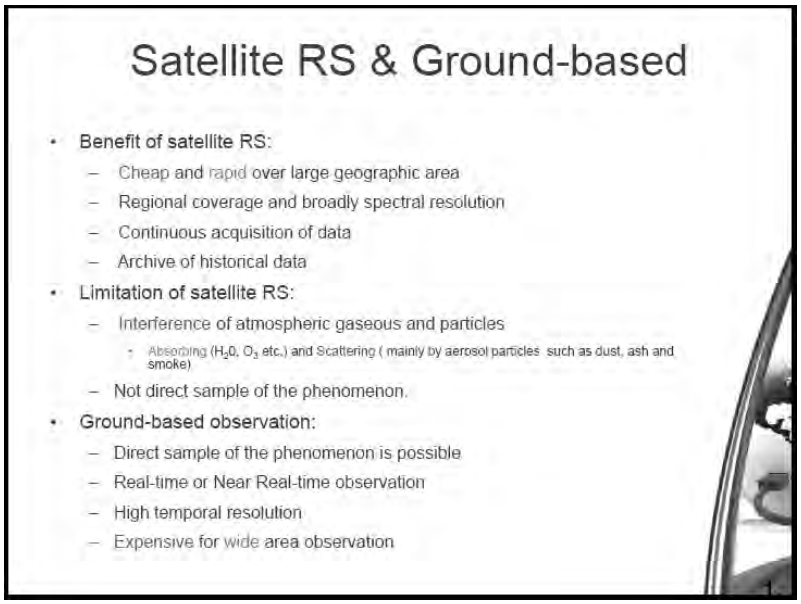
Field Server

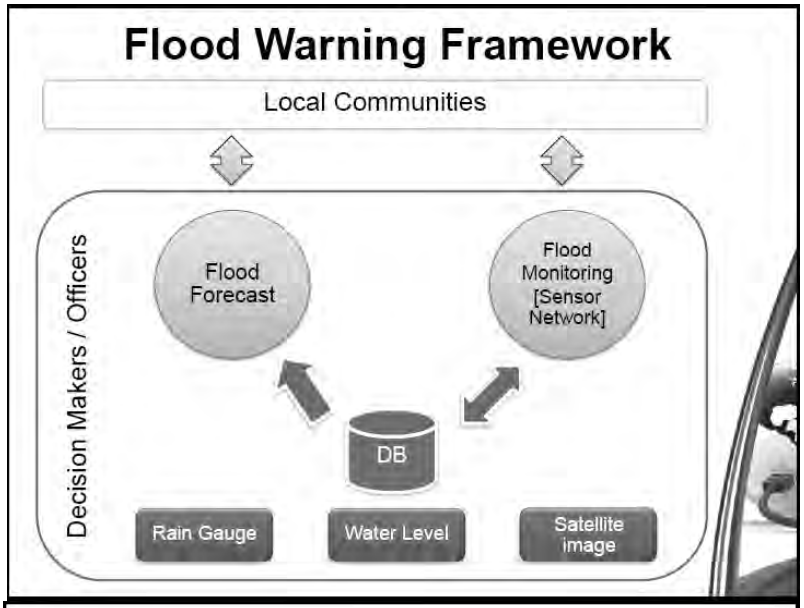
Live E!

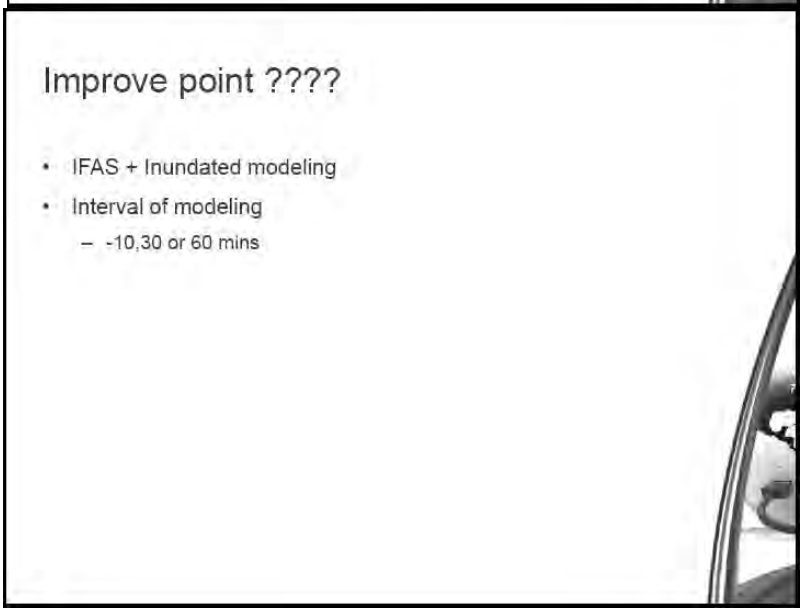
(Figure from
http://model.job.affrc.go.jp/FieldServer/)

GSMaP

- Global Satellite Mapping of Precipitation
- JAXA/EORC offers hourly global rainfall maps in near real time.
  - About four hours after observation
- Passive microwave radiometer data
  - TRMM/TMI, Aqua/AMSR-E, ADEOS-II/AMSR, DMSP/SSMI(F13, 14, 15)
- Resolution 0.25x0.25deg and 0.1x0.1deg
- 1996 up to now


Satellite RS & Ground-based
• Benefit of satellite RS:
– Cheap and rapid over large geographic area
– Regional coverage and broadly spectral resolution
– Continuous acquisition of data
– Archive of historical data
• Limitation of satellite RS:
– Interference of atmospheric gaseous and particles
- Absorbing (H_2O, O_3 etc.) and Scattering (mainly by aerosol particles such as dust, ash and smoke)
– Not direct sample of the phenomenon.
• Ground-based observation:
– Direct sample of the phenomenon is possible
– Real-time or Near Real-time observation
– High temporal resolution
– Expensive for wide area observation


Flood Warning Framework
Local Communities
Decision Makers / Officers
Flood Forecast
Flood Monitoring [Sensor Network]
DB
Rain Gauge
Water Level
Satellite image


Improve point ????
• IFAS + Inundated modeling
• Interval of modeling
– -10,30 or 60 mins

State of Problems

- Lack of comprehensive framework with ease of use to the end-users
  - To utilized satellite remote sensing image and observation from available sensor network.
  - Accessing observation from various type sensor system in a common manner
- Data sharing problem
  - Ownership -> Budget concerns
  - Versioning of data
  - Lack of infrastructure and skills
- Huge amount of effort from user such as
  - Prepare, analyze and process both of datasets to achieve final results.
  - High requirement of user skills and sufficient computer support system.
    - Data acquire
    - Data preparation
      - » Map projection, Mosaic, Overpass time etc.

Satellite Field Integrator (SFI)

- Design to reduce the onerous tasks of
  - Data gathering
  - Manipulating
  - Processing

- Supports heterogeneous data formats in both remote sensing and sensor observation data
- Scalability to handle the increasing number of datasets currently available.
- Support for distributed data source
- Offers a robust, on-demand processing service

Open Geospatial Consortium (OGC)

- Open Geospatial Consortium (OGC)
  - Non-profit, international voluntary consensus standards organization
  - Industry, government, and university members
- Over 406 members worldwide – over 30 countries & 5 continents
  - 186 European members
  - 50 Asia-Pacific members - Japan, Republic of Korea, Australia, China, Taiwan and etc

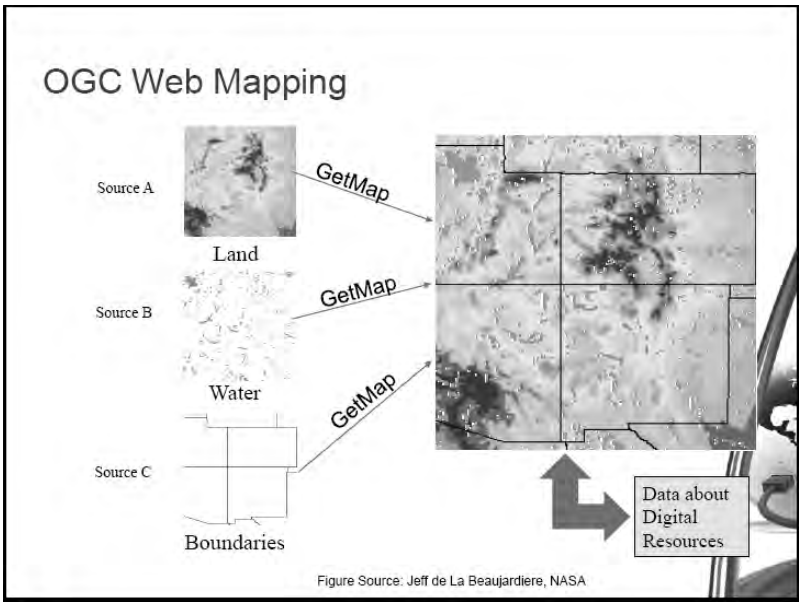
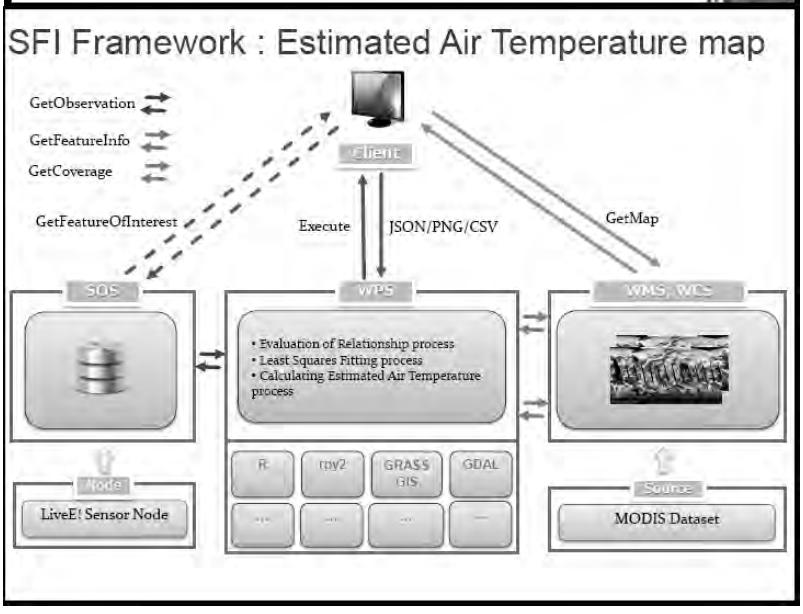
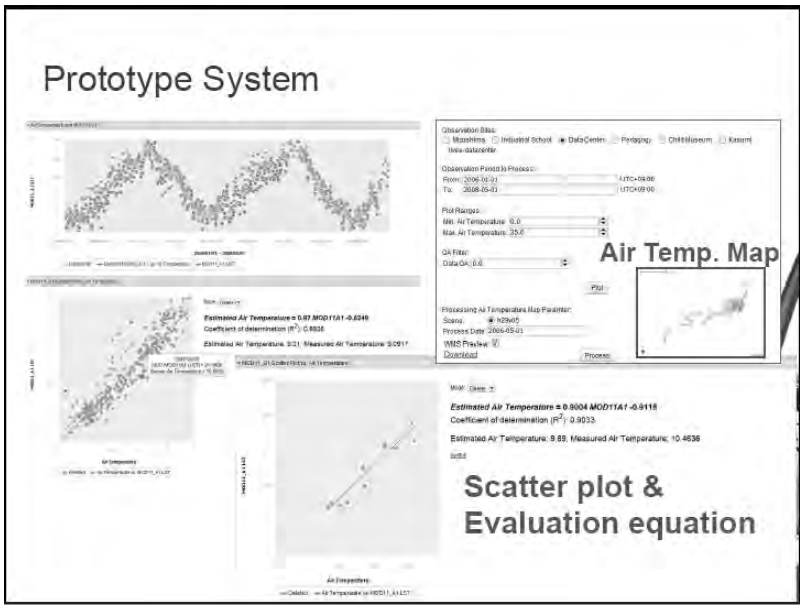
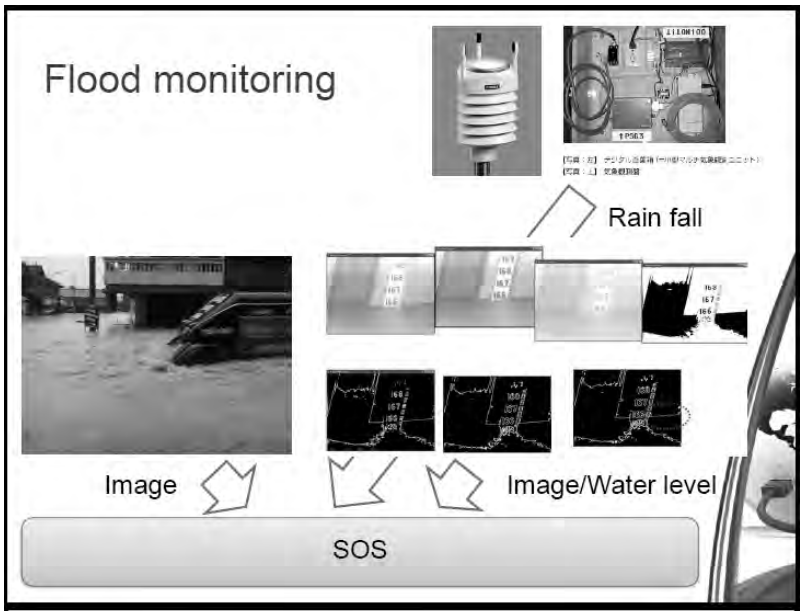
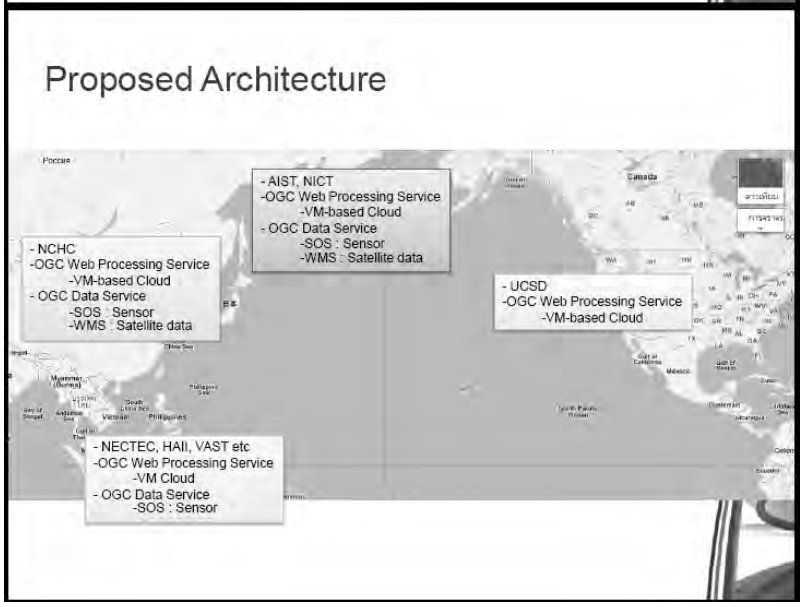

OGC Web Mapping
Source A
Land
GetMap
Source B
Water
GetMap
Source C
Boundaries
GetMap
Data about
Digital
Resources
Figure Source: Jeff de La Beaujardiere, NASA


Image Map and Feature or Coverage access
• Image map
– Just an image of data
– Easy for sharing
– Good for Visual Interpret
• Decision Makers
• Feature or Coverage
– Real data
– Further Analysis or Processing
– Lack of available service
– ownership


SFI Framework : Estimated Air Temperature map
GetObservation
GetFeatureInfo
GetCoverage
GetFeatureOfInterest
Client
Execute
JSON/PNG/CSV
GetMap
SOS
WPS
WMS, WCS
• Evaluation of Relationship process
• Least Squares Fitting process
• Calculating Estimated Air Temperature process
R
rpy2
GRASS GIS
GDAL
Node
LiveE! Sensor Node
Source
MODIS Dataset


Prototype System
Air Temp. Map
Scatter plot &
Evaluation equation


Flood monitoring
Rain fall
Image
Image/Water level
SOS


Proposed Architecture
- AIST, NICT
-OGC Web Processing Service
-VM-based Cloud
- OGC Data Service
-SOS : Sensor
-WMS : Satellite data
- NCHC
-OGC Web Processing Service
-VM-based Cloud
- OGC Data Service
-SOS : Sensor
-WMS : Satellite data
- UCSD
-OGC Web Processing Service
-VM-based Cloud
- NECTEC, HAII, VAST etc
-OGC Web Processing Service
-VM Cloud
- OGC Data Service
-SOS : Sensor

Conclusions

- Comprehensive web-based GIS system framework enabled
  - Based on various open standards of OGC specifications
- Assimilation of sensor observation data and satellite image
  - Wider area, More accuracy, Reasonable cost
- Location-based service (LBS) must be integrated
  - More data -> More accurate modeling
  - Time-critical application (e.g. disaster)
    - Information must be easy for interpretation and limit to scope of interest
    - Provide more accurate information
- Augmented Reality (AR)

Augmented Reality (AR)

Use of Area-mail System in Kagawa Prefecture during Typhoon Talas(No.12) in 2011

Miho Ohara

USE OF AREA-MAIL SYSTEM IN KAGAWA PREFECTURE DURING TYPHOON TALAS(NO.12) IN 2011

Miho Ohara
The University of Tokyo, ICUS

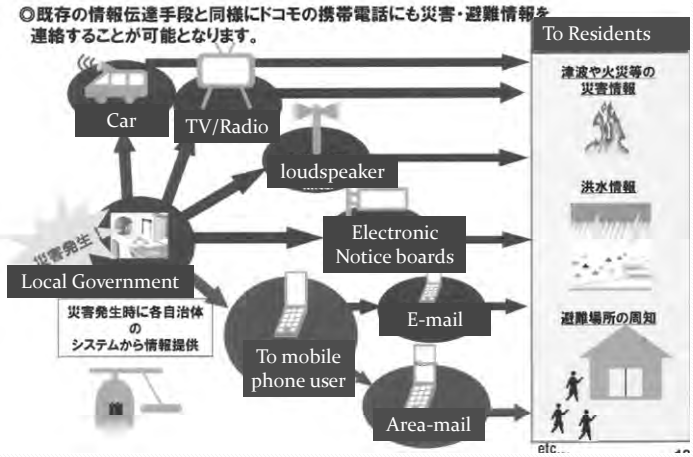
ABSTRACT

Typhoon No.12 hit western Japan between September 2nd and 4th, 2011. Recently, some local governments adopt area-mail system as a tool for distributing warnings and evacuation instructions in case of natural disasters. It is the system for sending messages to the mobile phone users when they are located inside specified area. Kagawa prefecture had heavy rain due to Typhoon No.12 and it faced dangers of land slides and floods. Kagawa Prefecture and several local governments sent mails for warning and evacuation calls by area-mail system. In this research, how area-mail system was used in these area were surveyed and ways for better use of the system was discussed.

Use of Area-mail System in Kagawa Prefecture during Typhoon TALAS(No.12) in 2011

Miho OHARA, ICUS

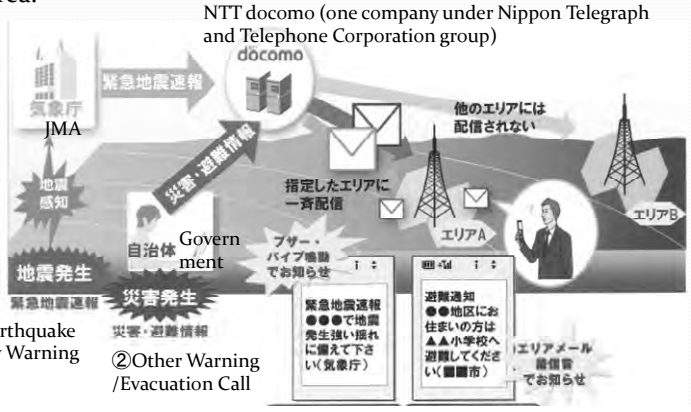
Ways for informing disaster warnings



Area-mail system

The system to provide disaster warnings /evacuation instructions to mobile phone users by mail when they are inside designated area.

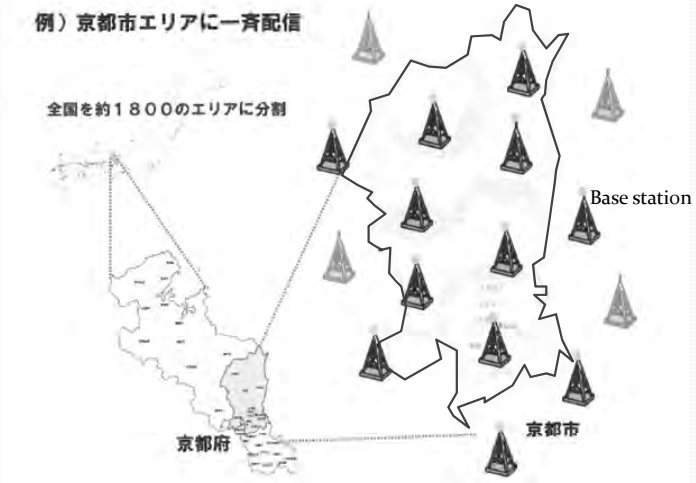
NTT docomo (one company under Nippon Telegraph and Telephone Corporation group)



①Earthquake Early Warning

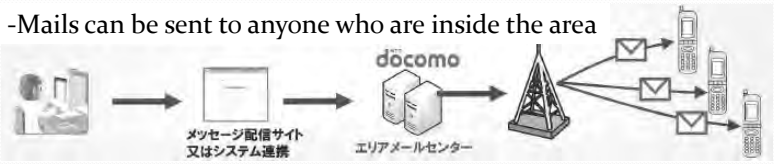
②Other Warning /Evacuation Call

Area-mail system



Merits of the system

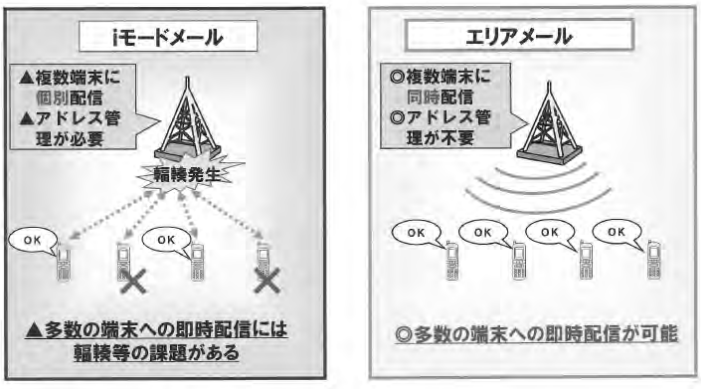
-Mails can be sent to anyone who are inside the area



-Not only residents but also tourists/commuters can get mails.
-It can send information to the people who can not get information by TV or loudspeakers.
-No need to resister mail addresses.
-It can alert a lot of people at the same time.
-Available mobile phone will expand in this year. (NTT Docomo + sofybank, au, etc.)

Difference between ordinary line and area-mail

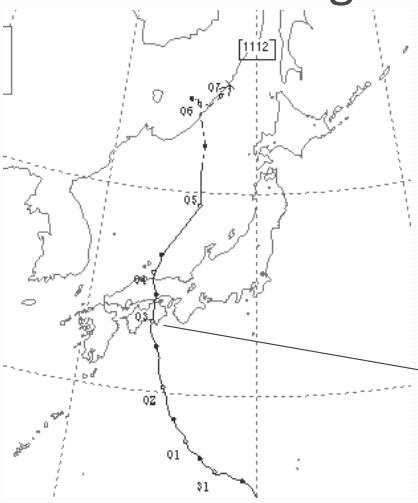
Area-mail doesn't become full due to one-way communication.



Information sent by area-mail

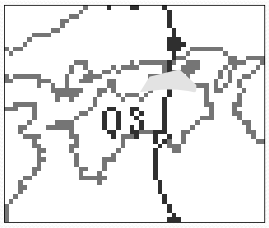
Disaster	Information
Earthquake	Earthquake Early Warning (from Japan Meteorological Agency)
Evacuation	Evacuation preparation advisory, evacuation advisory, evacuation order
	Alert area information
Flood	Flood warning of designated river
Landslide	Landslide warning information
Tsunami	Tsunami advisory, tsunami warning, large-scale tsunami warning
Volcano	Eruption warning
Earthquake	Prediction information of Tokai Earthquake
Terrorism	ballistic missile information, Information of air strike, guerrilla attack, terrorism.

Situation in Kagawa Prefecture



Path of Typhoon No.12 (Typhoon TALAS)

Maximum Cumulative rainfall: 667mm
Maximum rainfall per hour : 66mm (21-22:00 on Sep. 2)
Maximum instantaneous wind speed: 33.4m/s



System of Kagawa Prefecture

-Kagawa Prefecture adopted Area-mail system in August 2011.
-6 cities and 8 towns in Kagawa Prefecture also adopted the system as of the Typhoon No.12.

-Prefecture send information in case prefecture can get earlier than cities/towns or the area covers more than two cities/towns .
-Other information should be sent by cities/towns .

-For the citizens without NTT docomo users, there is another mail service to deliver warning information. But it require registration by citizen themselves. It cannot cover visitors outside Kagawa Prefecture.

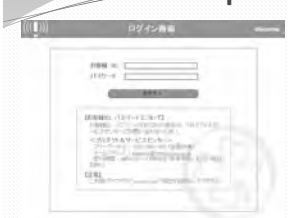
Mails sent by Kagawa Prefecture

Date	Time	All the area	Takamatsu-City	Marugame-City, Mannou-Town
Sep. 2	18:28	Landslide warning information		
	21:45	La		
	23:41			
Sep. 3	0:03			
	2:35			
	3:18			
	11:12	La in		
	12:20	La		
	15:46	La in		

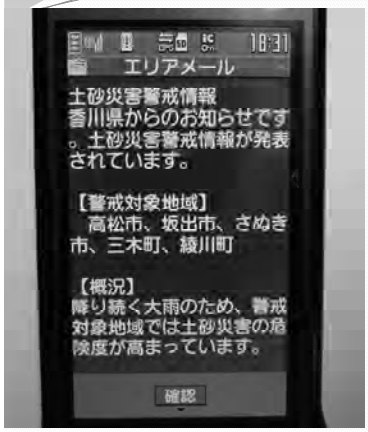
Mails sent by City or Town

-9/2 17:00 Evacuation advisory to some area in Miki-cho,
-9/3 0:30 Evacuation advisory to some area in Ayagawa-cho.

How to input information



Landslide warning information

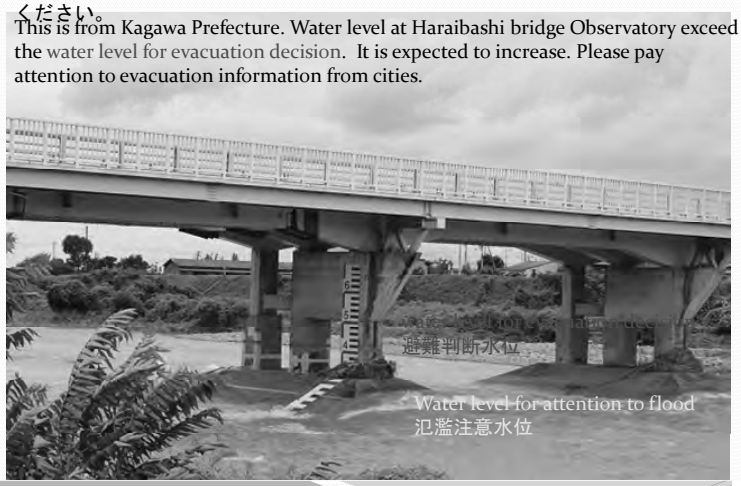


香川県からのお知らせです。土砂災害警戒情報が発表されています。
【警戒対象地域】
高松市、坂出市、さぬき市、三木町、綾川町
【概況】
降り続く大雨のため、警戒対象地域では土砂災害の危険度が高まっています。
【とるべき措置】
渓流や崖の近くなど土砂災害の発生しやすい地区にお住まいの方は、早めの避難を心がけるとともに、市町から発表される避難勧告などの情報に注意してください。

Doki-river

香川県からのお知らせです。土器川の祓川橋水位観測所では、避難判断水位に到達しました。水位はさらに上昇する見込みです。市町からの避難情報に留意してください。

This is from Kagawa Prefecture. Water level at Haraibashi bridge Observatory exceed the water level for evacuation decision. It is expected to increase. Please pay attention to evacuation information from cities.



Limitations

-Some of old mobile phones are not available.
-Mails can not be delivered if power of the mobile phones are off.

-

http://www.losttechnology.jp/k-tai/

Limitations

-Some of old mobile phones are not available.
-Mails can not be delivered if power of the mobile phones are off.

-It was the first mail from Kagawa Prefecture. People's understanding is insufficient.
-Proper evacuation should be done following the instruction.

Number of evacuated people

9月の台風による県内の避難状況(県まとめ)

■台風12号

	避難勧告世帯(人)	避難世帯(人)
さぬき市	2532世帯(7038人)	35世帯(105人)
東かがわ市	170世帯(383人)	1世帯(1人)
三木町	1万1240世帯(2万8967人)	36世帯(76人)
綾川町	2232世帯(6021人)	4世帯(40人)

■台風15号

東かがわ市	5039世帯(1万2699人)	69世帯(110人)

Lists of the local governments

(only East-Japan)

愛知県	名古屋市、豊橋市、岡崎市、一宮市、半田市、碧南市、刈谷市、豊田市、安城市、西尾市、犬山市、常滑市、小牧市、稲沢市、東海市、大府市、知多市、尾張旭市、高浜市、日進市、弥富市、みよし市、あま市、大治町、蟹江町、阿久比町、東浦町、南知多町、美浜町、武豊町、幸田町
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滋賀県	大津市
京都府	京都府、京都市、福知山市、舞鶴市、城陽市、木津川市、井手町
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奈良県	生駒市
和歌山県	和歌山県
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2011年10月27日現在

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2011年10月27日現在

The local government uses of social media at the time of the Kii peninsula flood

Tetsuya Ishikawa

THE LOCAL GOVERNMENT USES OF SOCIAL MEDIA AT THE TIME OF THE KII PENINSULA FLOOD

Tetsuya Ishikawa
The University of Tokyo, ICUS

ABSTRACT

In the beginning of September, 2011, typhoon 12 caused serious damage in Kii peninsula. while the disaster, some local governments used social media for distributing disaster information. In a time of disaster the local government uses of social media still has few examples. Thus the effect and present problem is not clarified. This presentation reports The local government uses of social media at the time of the Kii peninsula flood and clarify the effect and present problem.

1

THE LOCAL GOVERNMENT USES OF SOCIAL MEDIA AT THE TIME OF THE KII PENINSULA FLOOD

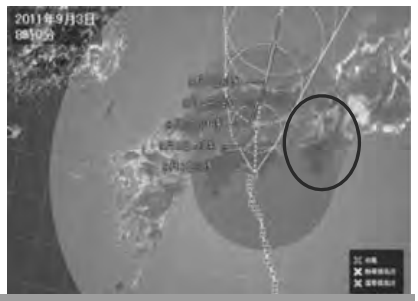
Master's course student
Ishikawa Tetsuya

2

Background

In the beginning of September, 2011,
typhoon No.12 caused serious damage in Kii peninsula.
while the disaster,
some local governments used social media
for sending disaster information.
That the local government used social media
in a time of disaster still has few examples.
Thus the effects and problems is not clarified.
This presentation reports the local government ,
Shingu city and **Nachikatsuura town**
uses of social media
at the time of the Kii peninsula flood
and clarify the effects and problems.

@Shingu_City **@Nachikatsuura**



3

What's social media?

Every user = info. sender & taker

Share of … Movie Photo Knowledge

facebook twitter

Friend's news Realtime information

In a time of disaster, **Facebook** and **twitter** can be used very well.

4

functions of social media

sending info. tool

collecting info. tool

communication tool

community tool

5

Social media is used in the time of disaster

Sanin-heavy snow
Haiti earthquake
etc…

I explain the Great East Japan Earthquake and Kii peninsula flood, focused on uses of social media.

6

2011.3.11
The Great East Japan Earthquake

7

Effects as sending information tool

The local government send Information by twitter or facebok,

while the local government were unable to use other information tools for blackout of the office.

岩手県

Iwate pref

Kesennuma city

青森県

Aomori pref and more

8

Effects as collecting information tool

Victims collect the local information for the long-term.

For example, local information are…

Damage & recovery

Aid supply

Evacuation center

9

Effects as communication tool

Many social media users talk radiation therapy team about radiation information through twitter.

question

answer

many people

radiation therapy team

http://twitter.com/team_nakagawa

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Effect as community tool

Reconstruction aid information portal site “Taskeai Japan” recruit through Facebook the workers for handling of disaster information.

2011.9
Kii peninsula flood

Interview survey
Nachikatsuura town and Shingu city
This survey focus on twitter
as local government’s information tool

12

Suspend of network lifeline

	Shingu city		Nachikatsuura town	
9/2				
9/3				
9/4	network lifeline is bad 9/3 ~ 9/7	Shingu city can send information in all days by twitter	network lifeline is bad 9/3 ~ 9/9	N-Town set up twitter account on 9/6 N-town only can send information by twitter 9/6 ~ 9/9
9/5				
9/6				
9/7				
9/8				
9/9				
9/10				

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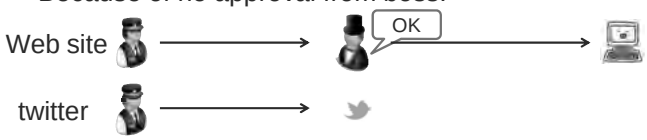
Effects as sending info. tool by local government

Local government send information by twitter more quickly than the other sending tools.

→Because of no approval from boss.



Negative effects

It's difficult to send accurate information for local resident

Because sending information quickly sacrifice accuracy.

Problems as sending info. tool

Local government can't comprehend
how many victims get information by twitter
and where people get information by twitter.

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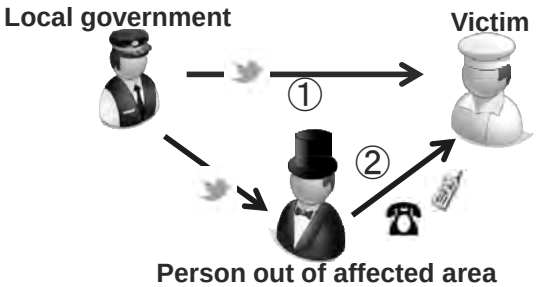
Effects as collecting information tool

twitter has 2 information paths.

①Direct path : Victim get info. from local government by twitter.

②In-direct path : from person out of affected area by other tools.



People can get information when you need by twitter.

Because twitter is text media information tool.

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Effects as communication tool

Response from victims

・Many requests for government action

・Many questions about government action

→One to many communication is easier than phone.
Thus, reply for question by twitter is more efficient than phone.

Response from the other agencies

ex. NHK propose by twitter to Singu city the offer of the broadcast equipment, when the Singu city was unable to use other communication tools .

Problem as Communication tool

Administrative officer can't confirm all the responses from twitter .
Because they are very busy.

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Effect as community tool

Local government announce the volunteer activity by twitter

Administrative officer in Nachikatsuura said that

with message from twitter as an opportunity,
many people join volunteer activity,
and 7,965 people join the volunteer activity 9/7~10/16.

Announce of volunteer information by twitter is useful.
I mean announce out of affected area is useful.

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Feature of each information tool by local government

	inform to target area	announce to the volunteer	Quickness	Media
public radio	◎	×	○	voice
area mail	◎	×	○	text
Site of local government	×	○	○	text
Twitter	×	◎	◎	text

Twitter's features

① Sending information quickly.
② Sending information to non affected area very well.
③ Getting information when you need.
④ Difficulty to send to target area.

Problem of local government's twitter operation

Administrative officer can't comfirm all the responses from twitter .
Because they are very busy.

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Thank you for listening !!

Overview of Flood Management in Japan

Akiyuki Kawasaki

OVERVIEW OF FLOOD MANAGEMENT IN JAPAN

Akiyuki Kawasaki
The University of Tokyo, ICUS
akiyuki.kawasaki@gmail.com

ABSTRACT

Flaws in preparedness and disaster response by governmental agencies were suggested as one of the factors contributing to the damage caused by the 2011 Thai flood. Through a field survey and interviews with relevant authorities, we were able to clarify the emergency response of the Thai government and Bangkok Metropolitan Administration (BMA) focusing on information sharing and coordination. First, the expansion process of the Thai flood and its damage was summarized. Second, the emergency response situation of both the Thai government and BMA and the flood recovery system were investigated. Finally, challenges for improving disaster response in Thailand were discussed.

Overview of Flood Management in Japan:

Focusing on river, rainfall and flood information

Akiyuki Kawasaki

Several slides are inserted from the following presentations at the 1st Joint Seminar of Integrated Water Resources Management Plan for Chao Phraya River by SCWRM & JICA, January 14th 2012:
"JMA's activities against flood-related disasters" by Dr. Akihiko Shimpo, Office of International Affairs, Japan Meteorological Agency (JMA); and "Building Safer Country by Best Mix of Structural and Non-structural Measures including Integrated River Basin Information Handling" by Mr. Omata, Water and Disaster Management Bureau, Ministry of Land, Infrastructure, Transport and Tourism (MLIT).

History of flood control in Tone River basin (400years ago)

Up to 15th Century, Tone River crossed the Kanto Plain from north to south and flew into Tokyo Bay

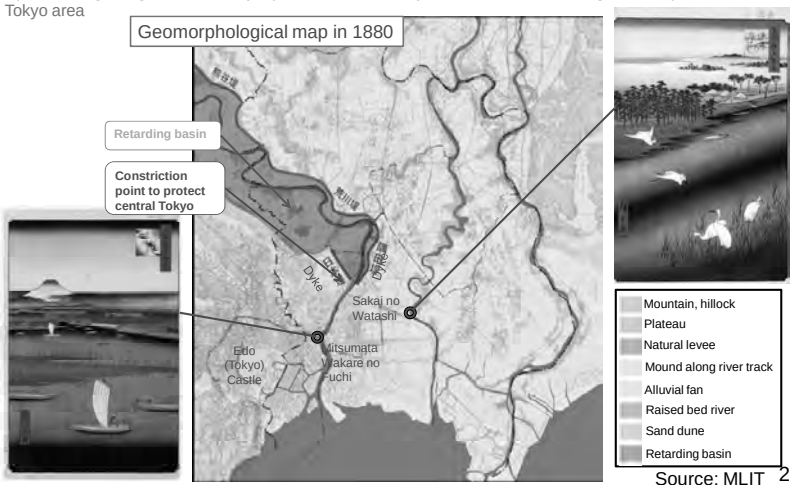
From 1594 to 1654, Tone River was connected to Pacific Ocean by eastward channel

- After the flood in 1910, flood control measures in upper and middle reaches has changed from "flood control allowing inundation" to "sequential levees confinement"
- After this change, the maximum discharge in the Tone River Channel has increased, which became the main challenge of flood control in Tone River Basin

Source: MLIT 1

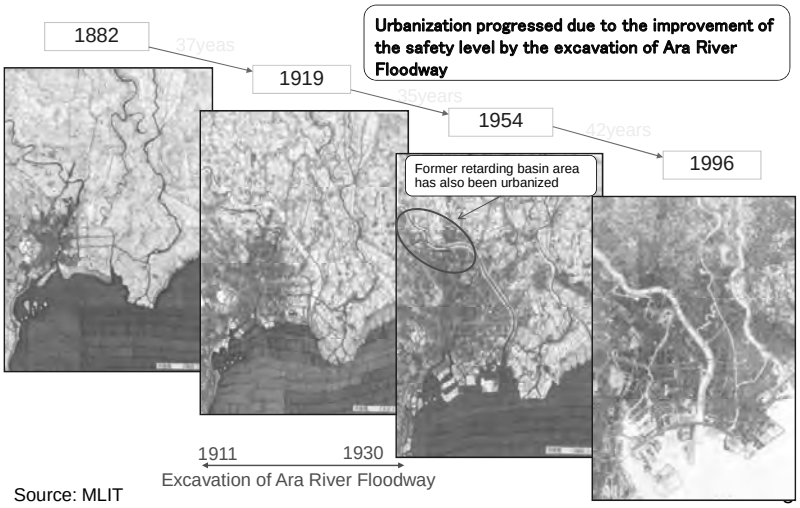
History of flood control in Ara River basin (130years ago)

Up to the beginning of 19th century, upstream area of Tokyo functioned as retarding basin to protect central Tokyo area



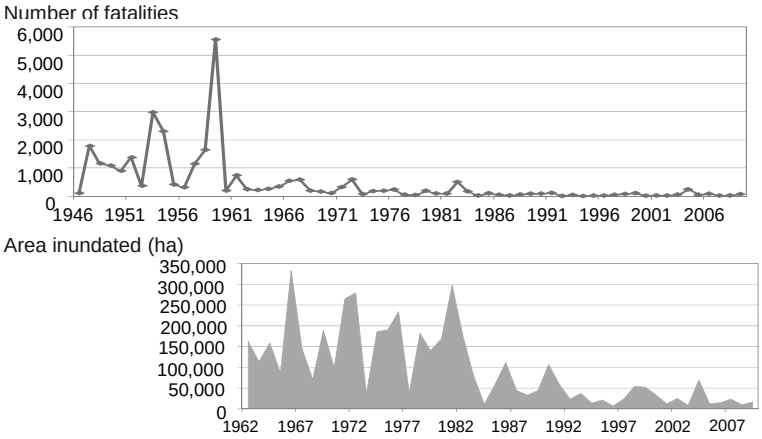
Source: MLIT 2

Japanese metropolitan area has developed with flood defense woks



Source: MLIT

Reduction of flood damages in Japan

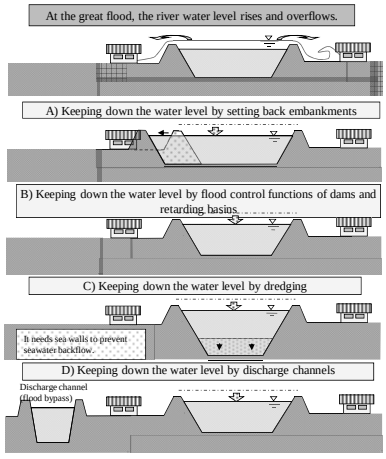


Number of fatalities and inundation area have dramatically been reduced in Japan due to continuous investment in and efforts for flood mitigation.

Source: Water Disaster Statistics, Ministry of Land, Infrastructure Transport and Tourism

4

Structural (Hard) Measures for Flood Mitigation



Flood control principles

Lowering the water level at floods to maintain safe flow of the river

A) Keeping down the water level by setting back embankments (increasing the river width) to increase the river capacity

B) Keeping down the water level in the downstream by pooling the overflowing water at dams and retarding basins to decrease the flow volume

C) Keeping down the water level by dredging (digging down the river bed) to increase the river capacity (It may needs estuary barrages.)

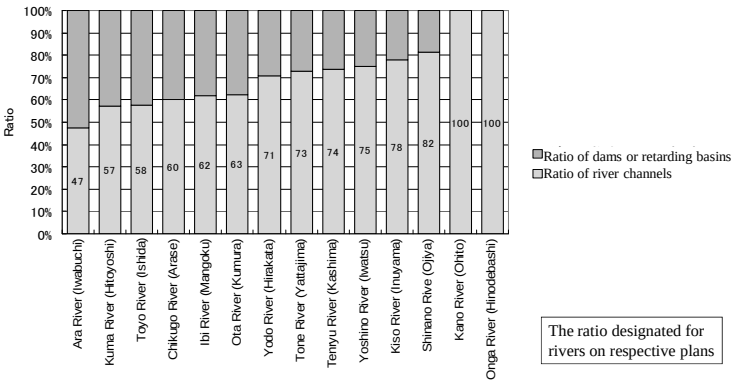
D) Keeping down the water level in the downstream by discharge channels to bypass overflowing water

Source: MLIT

5

Options in Structural (Hard) Measures for Flood Mitigation

Ratio between dams and retarding basins at major rivers of the country



Source: MLIT 6

Sharing of River Information

Since 1977: Collection of real-time precipitation and water level data advanced due to the unified specification of telemeter systems prepared by the national government.
→ System for viewing **real-time river information** was developed at each on-site office.

【Problems】
○The systems used on-site were developed separately at different offices, thus their software, hardware and operational procedures were all different and inconsistent.
○Dedicated software was needed to view the information. Therefore the river administrators had to order a system upgrade to the developers even for small changes.
○Only the river information possessed by the office that developed the system could be browsed.

【Social background】
○Massive human damage caused by Tokai heavy rainfall in 2000, and the severe damage caused by underground inundation by Fukuoka heavy rainfall in 1999
→ Importance of provision and sharing of accurate information was recognized
○Improvement of the information and telecommunications infrastructure due to the advancement of IT technology

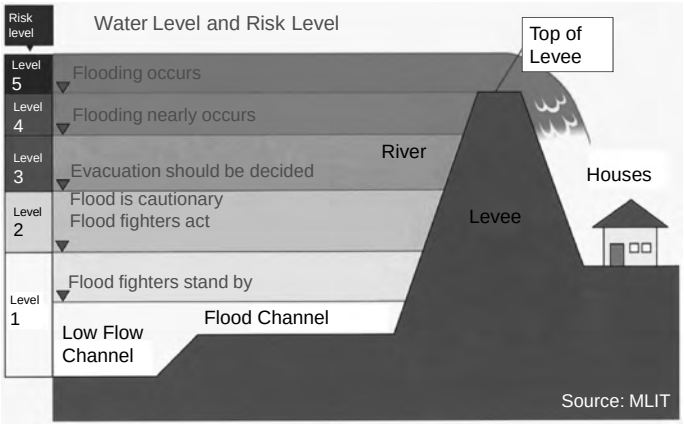
Launching of "Integrated River Information System " for sharing river information nationwide in 2004.

【System features】
○The data collected and provided includes not only the river information Ministry of Land, Infrastructure, Transport and Tourism (MLIT), but also the data possessed by Japan Meteorological Agency (JMA), the prefectural and city governments and the Road Department of MLIT, etc.
○Anyone including the public can browse the nationwide river information through the internet
○The river information can be browsed through the web-based interface, thus not dependent on the system environment.
○By incorporating a common system throughout Japan, total cost was reduced.

Source: MLIT 7

Information Provision for Encouraging Evacuation

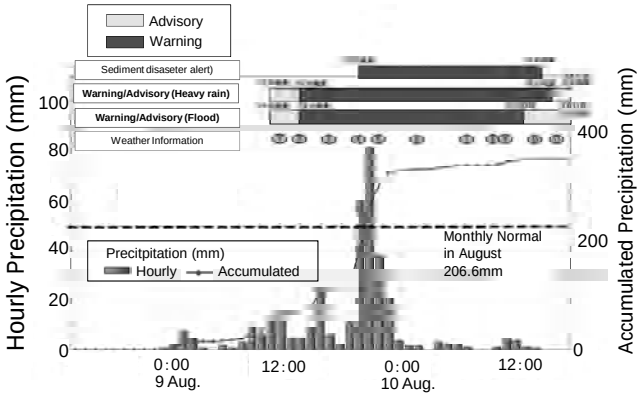
In order to promote smooth evacuation actions reference to water levels for evacuation orders have been established and categorization of water levels based on risk levels have been implemented.



8

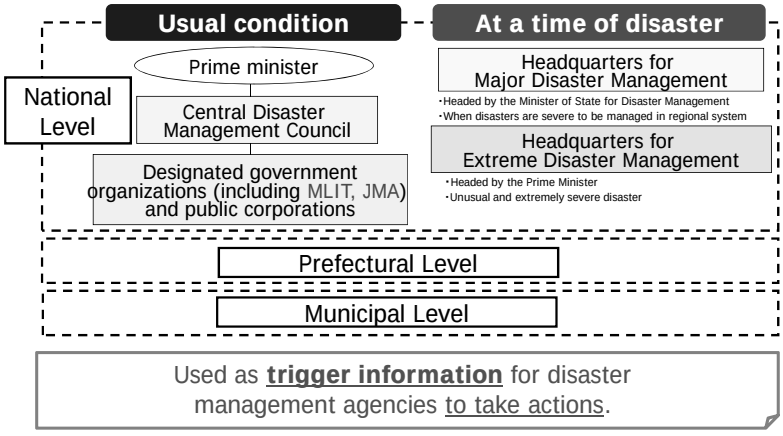
Sharing rainfall information

In case of Sayo town (Hyogo Prefecture) in Aug. 2009 < Etau (0909)>



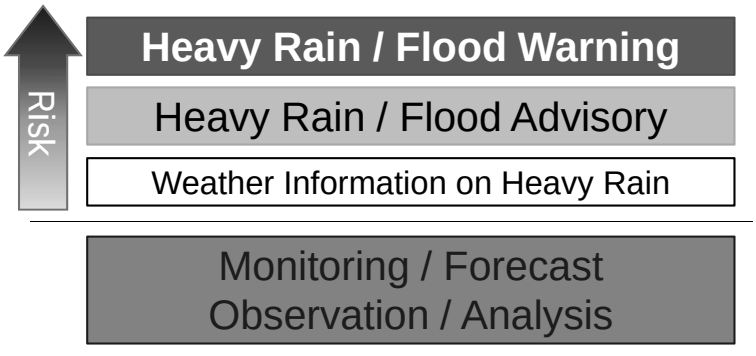
Source: JMA

Overview of disaster management system of Japan



Source: JMA

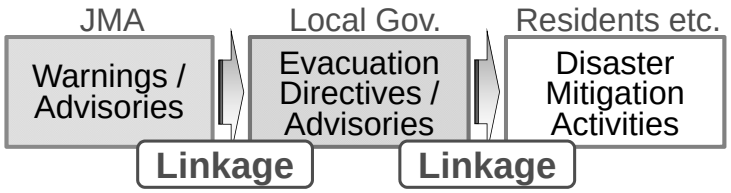
Flood Warnings & Advisories



Source: JMA

Linkage between weather warnings and disaster responses

- It is very important to deliver warnings/advisories to contribute to the disaster responses by central/local governments and residents (end users).
  - Evaculation Directives/Advisories : Local Government
  - Disaster Mitigation Activities: Residents etc.



Source: JMA

Summary

- To carry out effective activities against the flood disasters, it is essential to monitor weather conditions based on observation and forecast in both disaster condition and usual condition.
  →What data is available in Thailand?
- It is essential to deliver warnings/advisories to contribute to the disaster responses by central/local governments and residents (end users).
  →How can we achieve it ? (Target of our FS)
- To make these warnings/advisories more effective, it is useful to determine criteria of warnings/ advisories using historical records of disaster and rainfall information.
  →What is the criteria in Thailand?

Source: JMA

Summary (cont.)

- It should be emphasized that improvements in weather information and warnings/advisories are based on the enhancement of observation systems/networks and the improvements of forecast skills.
  How is the situation in Thailand?
- In addition, it is also important to establish appropriate cooperation and coordination among relevant agencies/organizations.
  - Warnings/Advisories for designated rivers: JMA - MLIT, local gov.
  - Making criteria of Warnings/Advisories: JMA - local gov.

  →How is the status of cooperation among RID, TMD, NDWC, Agri and Hydro Informatic Institute?

Source: JMA

Appendix

Participants

The University of Tokyo	Dr. Haruo Sawada, Prof., ICUS, IIS
	Dr. Miho Ohara, Assoc. Prof., ICUS/CIDIR, IIS
	Dr. Akiyuki Kawasaki, Project Assoc. Prof., ICUS, IIS
	Dr. Daisuke Komori, Research Asst. Prof., IIS (23rd)
	Dr. Shinya Kondo, Project Researcher, ICUS, IIS
	Ms. Salinthip Kungvalchokechai, PhD Candidate, Grad. School of Eng.
	Mr. Makoto Fujiu, PhD, Candidate, Graduate School of Interdisciplinary Information Studies (23rd – 26th)
	Mr. Hirotoshi Kishi, PhD Candidate, Graduate School of Eng. (25th)
	Mr. Tetsuya Ishikawa, Master's course student
Asian Institute of Technology (AIT)	Dr. Sangam Shrestha, Asst. Prof., School of Engineering and Technology
	Dr. Sarawut Ninsawat, Instructor, School of Engineering and Technology
Chiang Mai University	Dr. Manop Kaewmoracharoen, Lecturer, Department of Civil Eng.
Loei Fund for Nature Conservation and Sustainable Development Foundation	Mr. Adisorn Sunthararuk, Representative
	Mr. Akira Kodaka

Schedule

January

22nd Sun

Bangkok → Tokyo

23rd Mon

Work-progress-report presentation and discussion

@ Room Bw601, Institute of Industrial Science, The University of Tokyo

10:00 - 10:20	**Introduction** (Self introduction, Purpose of this workshop) Dr. Akiyuki Kawasaki, ICUS-UT
10:20 – 10:40	**The Chao Phraya flood and flood control measures for future** Dr. Komori Daisuke, IIS, UT
10:20 – 10:40	**Disaster Response in Thailand's Great Flood 2011**, Dr. Manop Kaewmoracharoen, Chiang Mai University
10:40 – 11:00	**Remarks on figuration of internet-based information from a point of view of an end user-A case of the Thailand's great flood 2011-** Mr. Akira Kodaka (Loei Fund for Nature Conservation and Sustainable Development Foundation)
11:00 – 11:20	**Loei Province and the Distribution of Disaster Information in the Loei River Basin**, Mr. Adisorn Suntrarak (Loei Fund for Nature Conservation and Sustainable Development Foundation)
11:20 - 11:40	**TBD** Dr. Sangam Shrestha, AIT
11:40 – 13:00	Lunch
13:00 – 13:20	**Typhoon Talas – quick report from Kii Peninsula, Japan** Dr. Shinya Kondo, ICUS-UT
13:20 – 13:40	**Development of Flood Inundation modeling using Sensor Network and OGC Web Services,** Dr. Sarawut Ninsawat (AIT)
13:40 – 14:00	**Use of Area-mail System in Kagawa Prefecture during Typhoon No.12 in 2011**, Dr. Miho Ohara, ICUS-UT
14:00 – 14:20	**Automatic deforestation monitoring using high temporal resolution remote sensing data** Ms. Salinthip Kungvalchokechai, UT
14:20 – 14:40	**The local government uses of social media at the time of the Kii peninsula flood** Mr. Tetsuya Ishikawa, UT/Chuo Univ.
14:40 - 15:00	**Overview of Flood Management in Japan** Dr. Akiyuki Kawasaki, ICUS-UT

15:00 – 15:15	Break
15:15 – 16:15	Discussion
18:00-20:00	Welcome party at Koan (Japanese restaurant) near Ikenoue Station.

24th Tue

9:00	Meeting at the lobby of Faculty House (Dr. Kondo will come to pick up)
10:00 – 12:00	**Visitation to the Foundation of River & Basin Integrated Communications** http://www.river.or.jp/outline/index.html
12:00 – 13:30	Lunch
13:30 – 14:30	Transfer
14:30 – 16:30	**Workshop and discussion for further study** @ Room Bw601, Institute of Industrial Science, The University of Tokyo
17:00- 18:30	2nd Welcome party@ICUS room

25th Wed

9:15	Meeting at the lobby of Faculty House (Dr. Kondo will come to pick up)
11:00-12:00	**Visitation to Arakawa-Karyu Office in the Ministry of Land, Infrastructure and Transport** http://www.ktr.mlit.go.jp/arage/english/index.html
12:00 - 13:00	Lunch
13:00 – 15:00	**Visiting the Arata Super Embarkment** http://www.ktr.mlit.go.jp/arage/disaster/now/super/shinden.html (Stopping by the top-view observation deck of Tokyo Metropolitan Government in Shinjyuku on the way back Komaba, if possible)
18:00 – 20:00	Joining Niseikai Party at Komaba I Campus

26th Thu

TBD	Meeting at the lobby of Faculty House (Dr. Kondo will come to pick up)
09:00 – 11:00	**Visitation to the Life Safety Learning Center of Tokyo Fire Department** http://www.tfd.metro.tokyo.jp/hp-hjbskan/
12:00 – 13:00	Lunch
13:00 – 14:00	**Sumida River boat Cruise (from Asakusa to Odaiba)** http://www.suijobus.co.jp/cruise/line/as_od_line.html
14:30 – 16:00	**Disaster Prevention Experience-learning Facility@The Tokyo Rinkai Disaster Prevention Park** http://www.ktr.mlit.go.jp/showa/tokyorinkai/english/index.htm

27th Fri

Tokyo → Bangkok

Acknowledgement

This workshop was financially sponsored by Japan Science and Technology Agency (JST) on FY2011 Special Project Formation Investigation: *An investigation on disaster information dissemination system for local community in rural mountainous area in Asia*. We would like to express our great gratitude to their support on our research activities.

謝辞

本ワークショップは、独立行政法人 科学技術振興機構（JST）平成 23 年度特定型課題形成調査【若手 FS】課題：*アジアの山間・農村地域コミュニティの災害対応力向上に向けた災害情報伝達システムの研究*によって支援されました。記して、深謝したします。

Edited by

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Coordinator, RNUS, SET, AIT.

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