



Use case based on Sentinel Asia's SOP in Vietnam

7th Joint Project Team Meeting of Sentinel Asia STEP3 (JPTM2019)

*Bangkok, Thailand
12 - 14 November 2019*

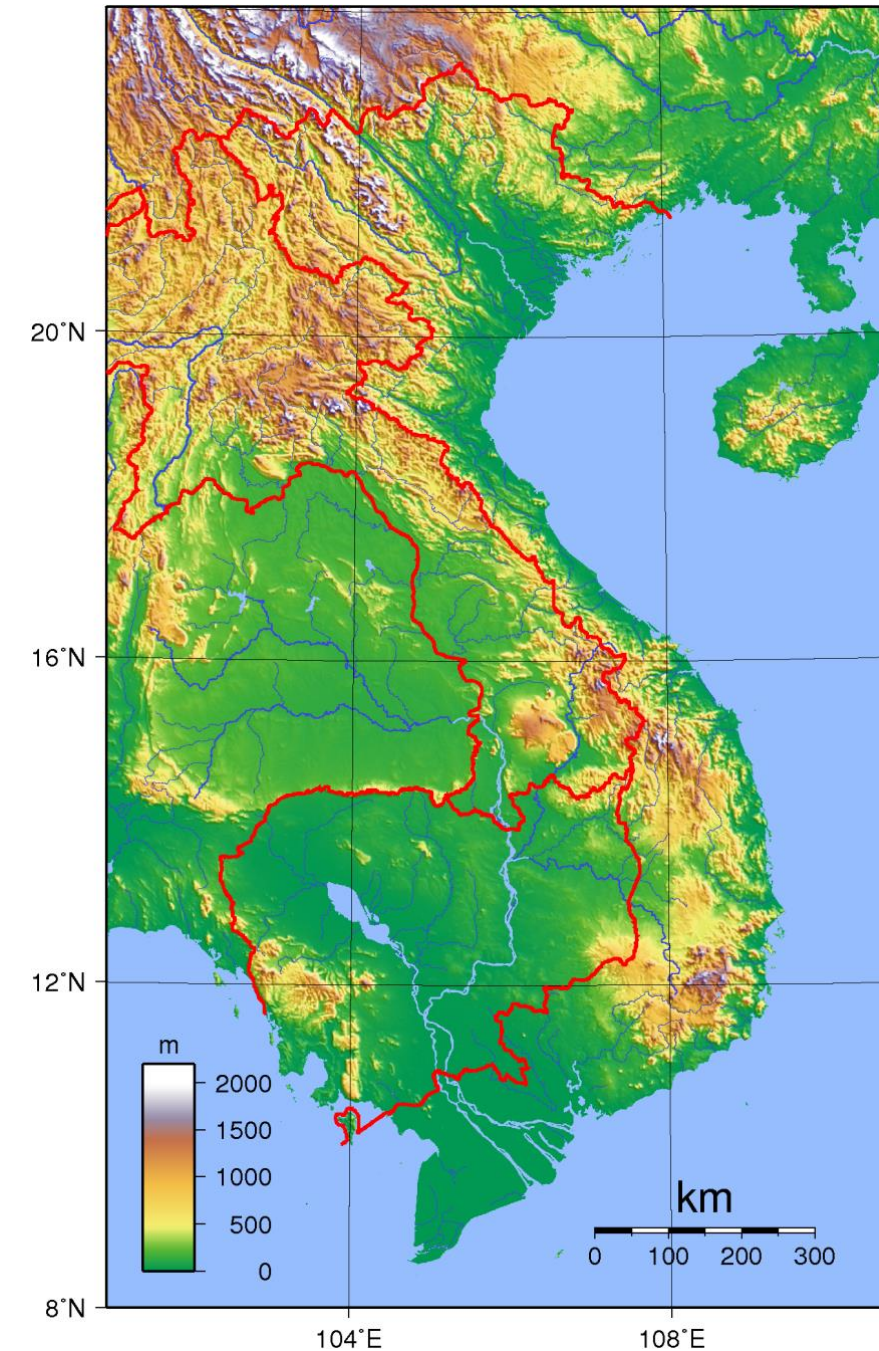
*Nguyen Quoc Dinh
Vietnam Institute of Geosciences and Mineral Resources (VIGMR)
Nguyen Quoc Phi
Hanoi University of Mining and Geology (HUMG)*

CONTENTS

- 1. Sentinel Asia's SOP in Vietnam**
- 2. A good use case for disaster management**
- 3. Efforts to improve disaster preparedness**

Sentinel Asia in Vietnam

- ❖ Sentinel Asia have been very active in Vietnam since 2015/2016
- ❖ Signed MOUs, provided training courses, organize the 4th JPTM and many other activities
- ❖ Thank you for the great contribution, DPNs/DANs have provided data for emergency tasks in Vietnam



Sentinel Asia in Vietnam

❖ Emergency Observation

Request (EORs)
















✓ 2017: 12

✓ 2018: 6

✓ 2019: 2 (3)

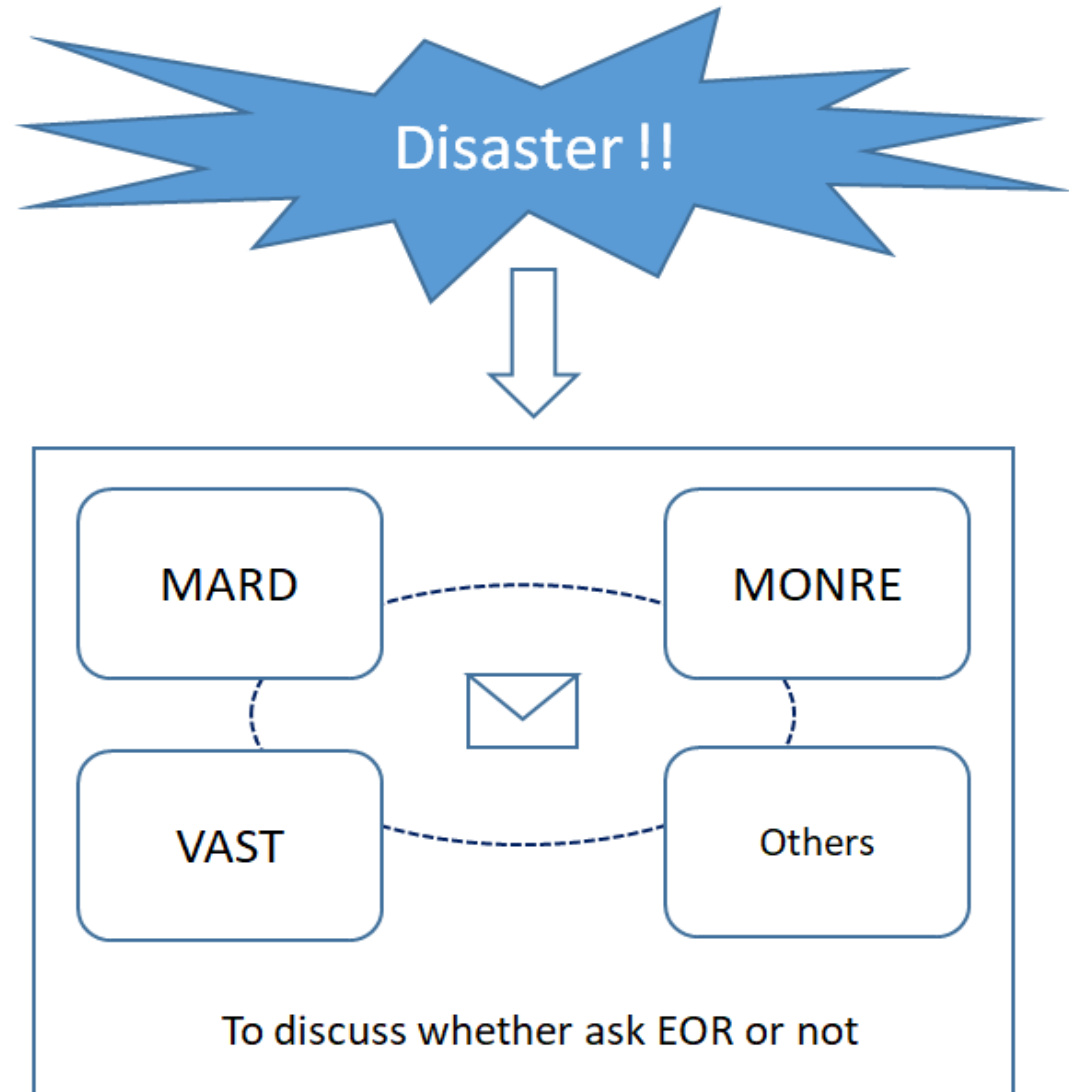
No	Activation date	Number of scenes received			Number of VAPs received		Activation agency
		ALOS-2	THEOS	RESOURCE SAT	Map	RGB image	
1	17/7/2017	6	1		5		MONRE
2	25/07/2017		7	2	1		MONRE
3	03/08/2017	3		2			MONRE
4	23/08/2017	4		1		2	MARD
5	15/09/2017	12	6	1	1	6	MARD
6	09/10/2017	6	7		3	3	MONRE
7	11/10/2017				2		MONRE
8	17/10/2017	9			3		MONRE
9	01/11/2017		4		1		MONRE
10	04/11/2017	6	16	1	4	3	MONRE
11	19/11/2017	4			2	2	MONRE
12	25/12/2017	4	10	1		4	MARD

Sentinel Asia in Vietnam

Emergency Obs. ID	Occurrence Date	Country	Disaster Type	Product	WEB-GIS	Detail	Disaster Inf.	Status
ERVNMN000057	05/Sep/2019	Vietnam	Flood			link	ADRC	Active
ERVNMN000054	24/Jun/2019	Vietnam	Flash flood			link	ADRC	Active
ERVNMN000053	24/Nov/2018	Vietnam	Typhoon			link	ADRC	Active
ERVNMN000052	18/Nov/2018	Vietnam	Typhoon			link	ADRC	Active
ERVNMN000051	17/Sep/2018	Vietnam	Typhoon			link	ADRC	Active
ERVNMN000050	27/Aug/2018	Vietnam	Flood			link	ADRC	Active
ERVNMN000049	18/Jul/2018	Vietnam	Flood			link	ADRC	Active
ERVNMN000048	23/Jun/2018	Vietnam	Flood			link	ADRC	Active

Sentinel Asia in Vietnam

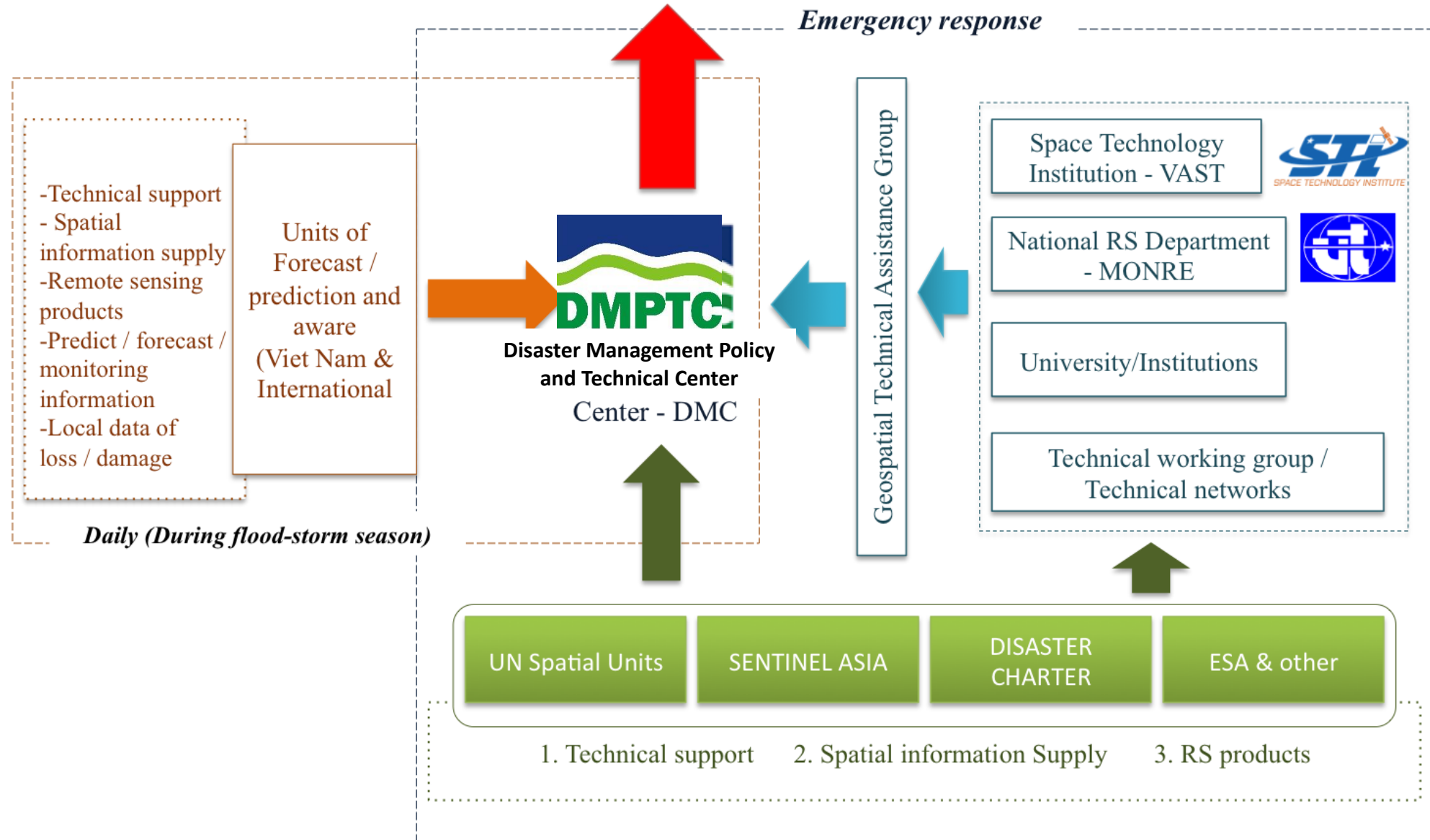
- ❖ Current Standard Operation
Procedure (SOP) for big disasters
- ❖ From 7/2017 to 10/2019
 - ✓ Floods: 15/20
 - ✓ Typhoons: 4/20
 - ✓ Flash floods: 1/20





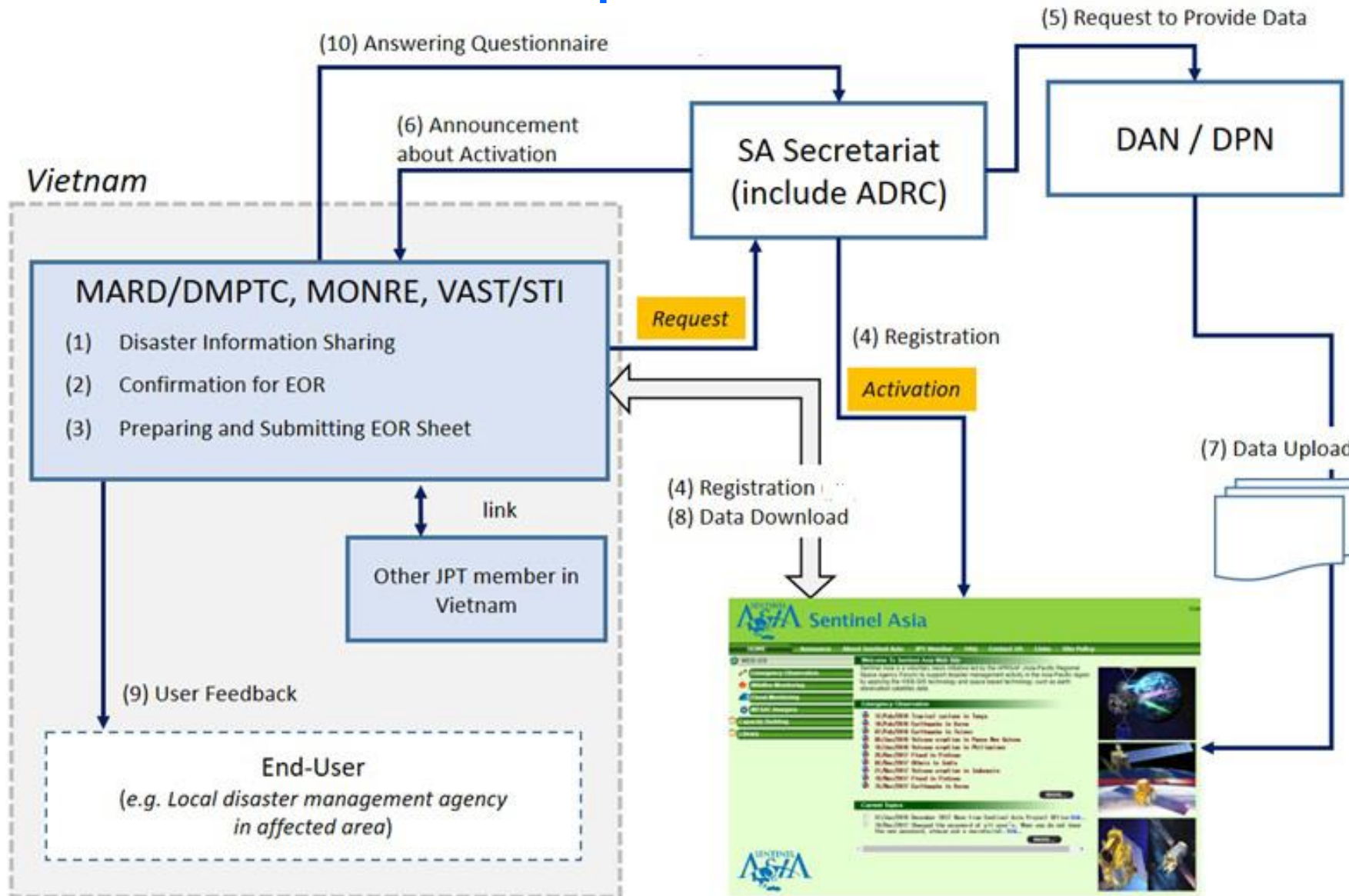
Standing Office of National Committee for Disaster prevention and Control

❖ Disaster management focal point



SOP for Vietnam 3/2018 (version 1.0)

Operation flow



Fill up the EOR Sheet

- ✓ Name and organization
- ✓ Contact Person
- ✓ Planned end-user
- ✓ Purpose of the Request

Requester (your name and organization)	
Your name	Ms. *****
Your organization	MONRE / VAST
	Membership: <input checked="" type="checkbox"/> JPT member <input type="checkbox"/> ADRC member
Your phone	+84-*****
Your cellular phone	+84-*****
Your fax	
Your E-mail	
Other E-mail(s) for n	

Contact Person	
※Fill in below in case different from the Requester	
Name	*****
Organization	*****
Phone	+84-*****
Cellular phone	*****
E-mail	
Other E-mail(s) for n	

Disaster Management Organization	
ADRC is the first point of contact in the Sentinel Asia EOR process. Local information by Disaster Management Organizations (DMOs) is quite essential to undertake the first evaluation of an EOR and judges the Sentinel Asia framework is suitable to assist. To proceed the EOR process, ADRC may contact with DMOs. Please provide following information.	
Organization Name	()
E-mail	*1
Other relevant information	(i)

Planned end-user of the observed information
Please provide us information, to the best of your knowledge, as to which organization (e.g. Disaster Management Organization), agency, or community will utilize the satellite image. ADRC may ask some questions to concerned organization, if needed.
<input type="checkbox"/> The information/image shall be used only for our organization
Please state your role in the organization during disaster response ()
<input checked="" type="checkbox"/> The information will be provided to other relevant organization/s.
Please fill in the name of the organization(Fire department in affected area)

- ✓ Types of Disasters
- ✓ Time limit for information to be uploaded on the SA WEB-portal
- ✓ Date of Occurrence / Details, news source
- ✓ Place of occurrence / Request area

Submitting EOR Sheet

Submit an EOR sheet to:

By E-mail : sarequest@adrc.asia (ADRC)

: z-sentinel.asia@ml.jaxa.jp (Secretariat of SA)

By FAX : +81-78-262-5546 (ADRC)

The screenshot shows the Sentinel Asia website interface. The top navigation bar includes links for HOME, Announce, About Sentinel Asia, JPT Member, FAQ, Contact US, Links, and Site Policy. The left sidebar contains menu items: WEB GIS, Emergency Observation, Wildfire Monitoring, Flood Monitoring, MTSAT Imagery, Capacity Building, Library, and Emergency Obs. Request (highlighted with a red box). The main content area displays the 'Emergency Obs. Request List' table with columns for Emergency Obs. ID, Status, Occurrence Date (UTC), Country, and Disaster Type. Below the table is the 'Emergency Obs. Request Information' form, which includes fields for Emergency Obs. ID, Disaster Type (set to Flood), Country (set to Japan), Occurrence Date (07/09/2017), Time (12:00), GLIDE Number, ADRC URL, User ID (adrc0001), Name (ADRC), Organization (ADRC), Phone (+81-78-*****), Cellular Phone (+81-80-*****), Fax Number (+81-78-*****), E-Mail 1 (mi-adrc@*****), E-Mail 2 (mi-ikeda@*****), E-Mail 3, E-Mail 4, and Observation Term (UTC) with From and To dropdowns.

The screenshot shows the 'Questionnaire on Emergency Observation Request' form. The title is 'Questionnaire on Emergency Observation Request.' Below the title, there is a note: 'Sentinel Asia would like requesters to give an important feedback to improve the system be great if you could help our work.' A red asterisk indicates a required field. The form asks: 'Which of the following emergency response activities were work using with satellite images and value added product (Multiple choice) *'. The activities listed are: Search, Rescue Operation; Damage Assessment; Evacuation Order and Guidance; Estimating Life Supporting Materials (e.g. Food, Water, Medicine, etc); Health and Medical Support; Coordination with National and International Supporters or Donors; Information Sharing through Media; and その他: _____.

Another section asks: 'What do you expect Sentinel Asia for your work ? (Multiple Choice) *'. The options are: Disaster Response; Pre-Monitoring; Early Warning; Hazard Map; Education and Training; Recovery Monitoring; Capacity development of various stakeholders; Capacity development of communities in building resilience; and その他: _____.

A final section asks: 'Which of the following natural disaster do you expect for disaster risk reduction for Sentinel Asia? (Multiple Choice) *'. The options are: Earthquake; Tsunami; Tropical Cyclone (Typhoon, Hurricane and Cyclone); and Flood.

❖ New OPTEMIS system: Emergency Request Form (or EOR)

Sentinel Asia 4.0.0

Emergency Request Form
Request Satellite Data

Requester

Name * Nguyen Quoc Phi
Organization * Vietnam Institute of Geosciences and M
Memberships * JPT membe

Phone +84 9
Cellular Phone +84 9
Fax
Email * nguyenguocphi@gmail.com

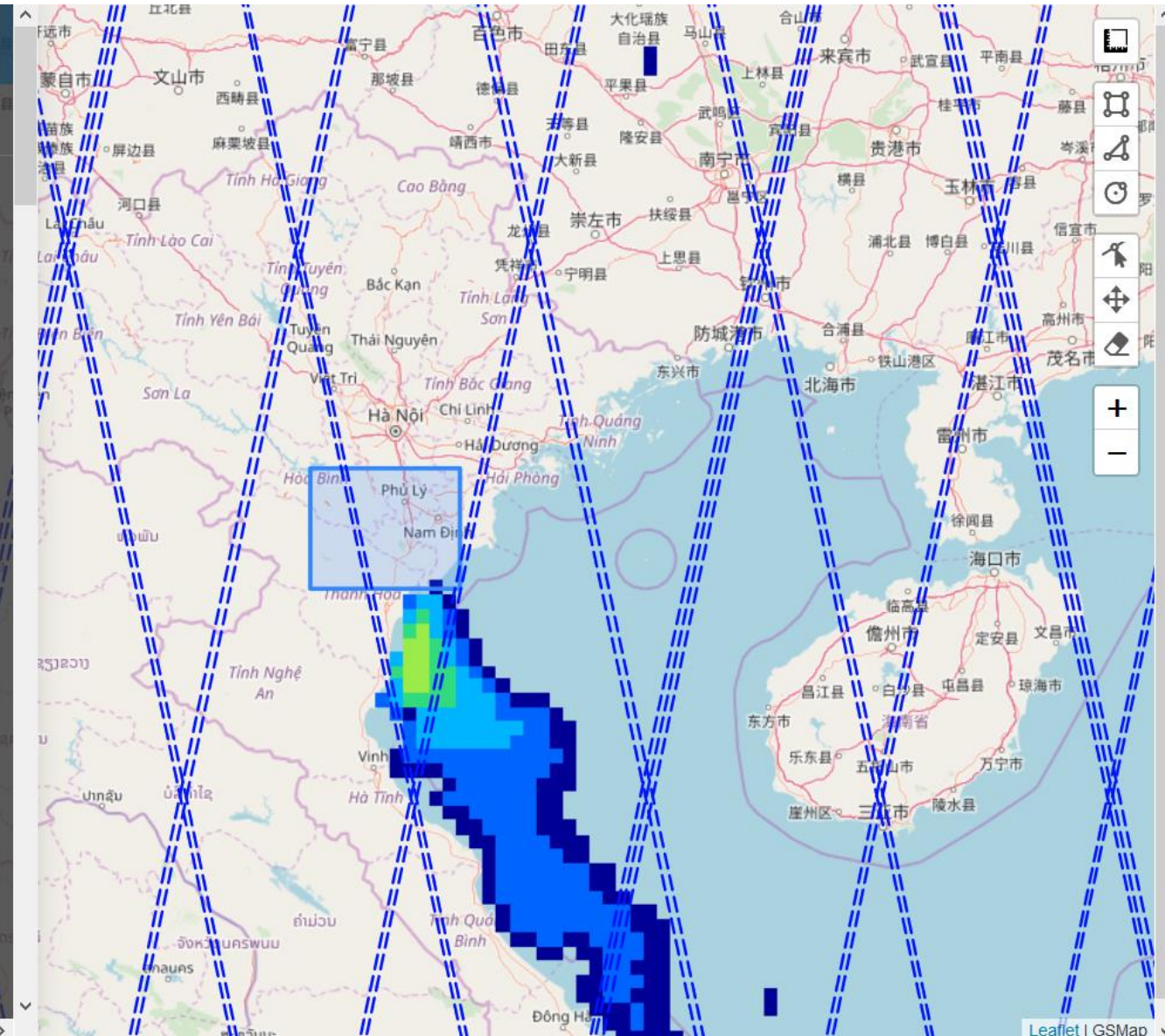
Email Notification (use commas to separate multiple email)
eg. example1@email.com, example2@email.com

Add Contact Person

Disaster Management Organization

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Organization	Email	Other relevant information



Sentinel Asia in Vietnam

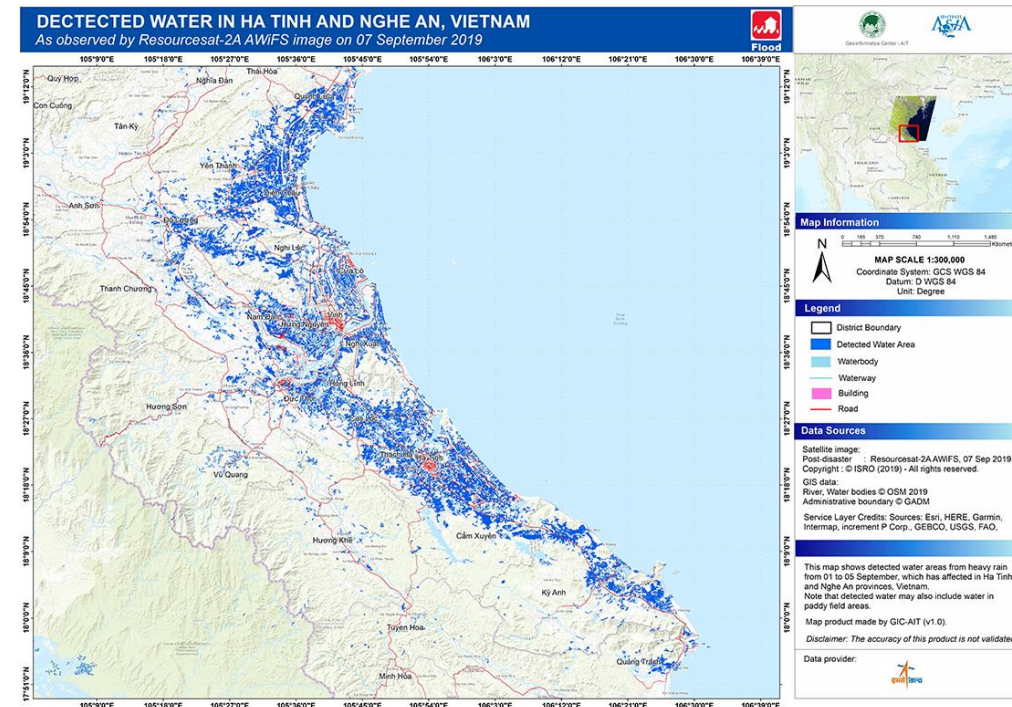
❖ Quick response for Emergency Observation Request (EORs), providing timely map/image (~4 days)

➤ Flash flood in Vietnam Lai Chau province

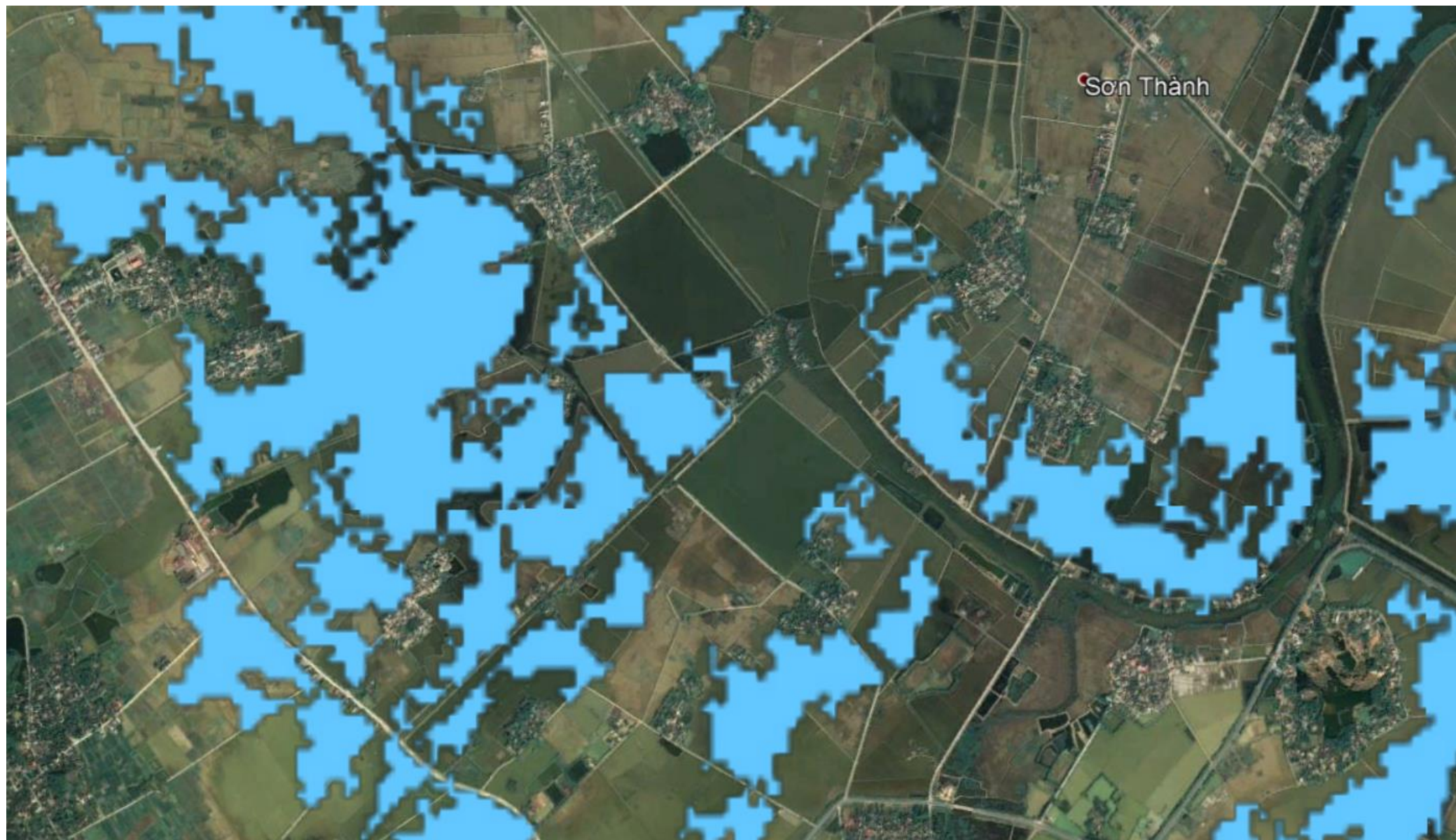
- ✓ Occurrence date (UTC): 2019-06-24
- ✓ SA activation date (UTC): 2019-06-25
- ✓ ALOS-2 PALSAR-2 (2019-06-28)

➤ Heavy rain from 1st to 5th September 2019

- ✓ Occurrence date (UTC): 2019-09-01
- ✓ SA activation date (UTC): 2019-09-05
- ✓ Flood map (2019-09-10)



❖ Provide with various data types: shape files, geotiff, kmz → Ready to use



















CONTENTS

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- 2. A good use case for disaster management**
3. Efforts to improve disaster preparedness

A use case in Nghe An province, Vietnam

- ❖ Tropical storm Son Tinh (July, 2018) (Attapeu dam collapse, Laos)
- ❖ Emergency Observation Request was issued

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ERVNMN000051	17/Sep/2018	Vietnam	Typhoon			link	ADRC	Active
ERVNMN000050	27/Aug/2018	Vietnam	Flood			link	ADRC	Active
ERVNMN000049	18/Jul/2018	Vietnam	Flood			link	ADRC	Active
ERVNMN000048	23/Jun/2018	Vietnam	Flood			link	ADRC	Active

Storm track (from 13 to 25, July, 2018)

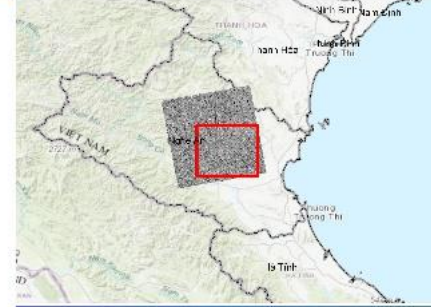
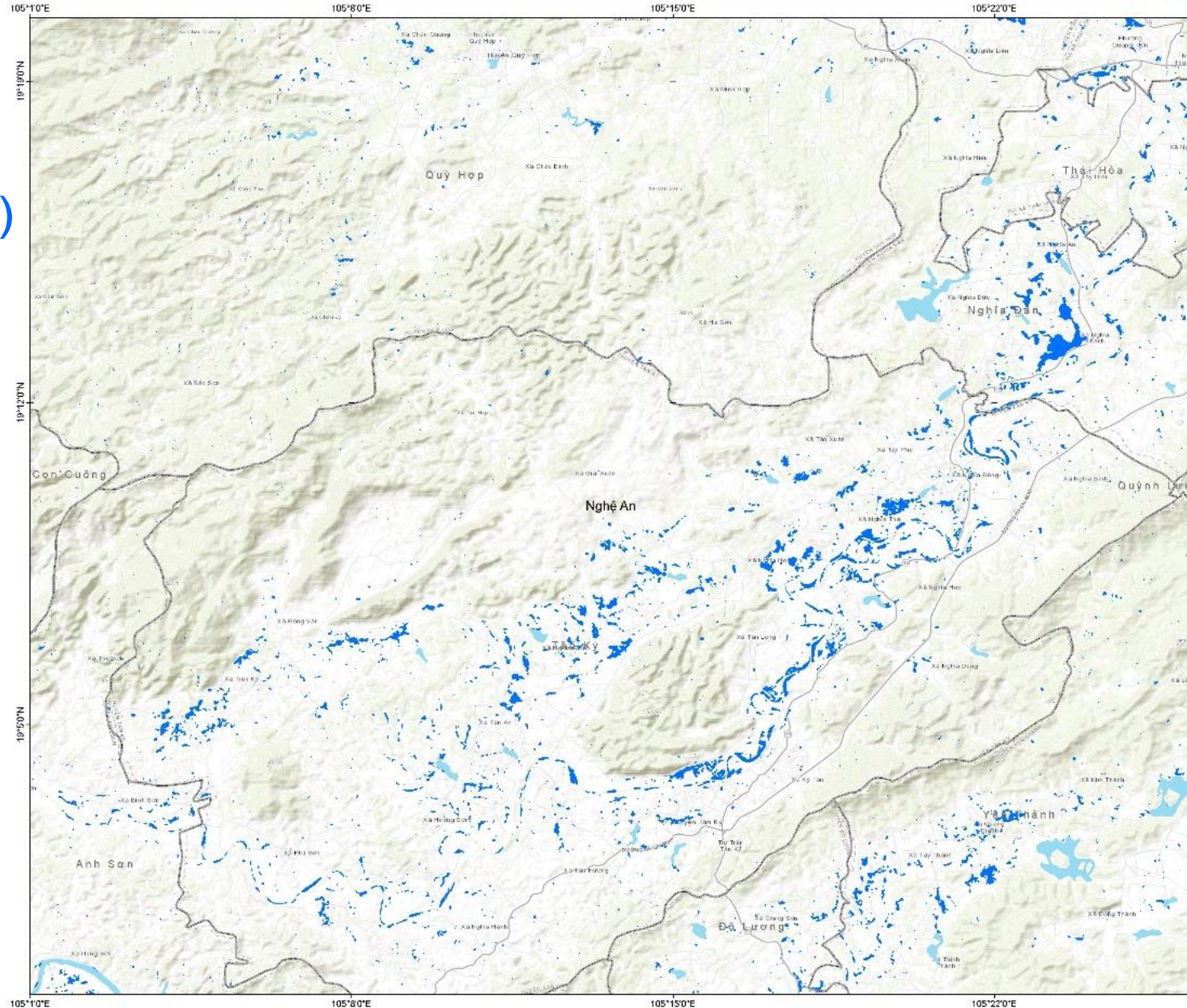


FLOODING IN HUYEN DISTRICT, NGHE AN, VIETNAM

As observed by ALOS-2 image on 28 July 2018



❖ Flood in Nghe An province (18-7-2018)



Map Information

0 2 4 6 8
Kilometers

MAP SCALE 1:75,000 at A1 PRINT
Coordinate System: GCS WGS 84
Datum: D WGS 84
Unit: Degree

Legend

- Province Boundary
- District Boundary
- Waterbody
- Flood Proxy Map

Data Sources

Satellite image:
Pre-disaster : ALOS-2, 23 March 2018
Post-disaster : ALOS-2, 28 July 2018
Copyright : © JAXA (2018) - All rights reserved.

GIS data:
River, Water bodies © OSM 2018
Administrative boundary © GADM

Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO,

Description

This map shows possible flooding areas from heavy rain, which has affected Huyen District and surrounding, Nghe An Province. Note that the detected-water may also include water in paddy area.

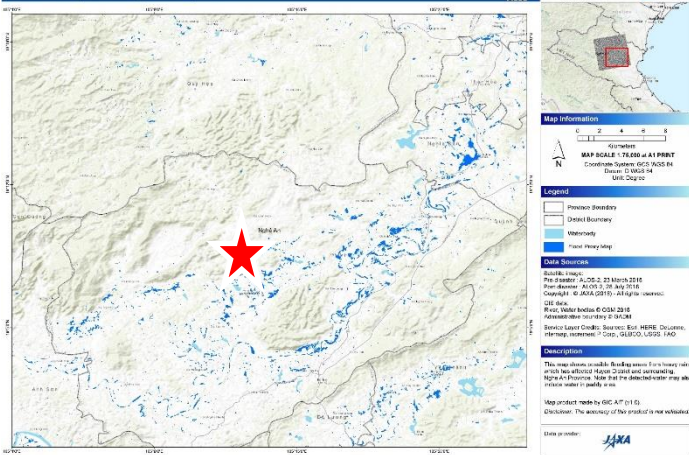
Map product made by GIC-AIT (v1.0).
Disclaimer: The accuracy of this product is not validated.

Data provider:

A use case in Nghe An province, Vietnam

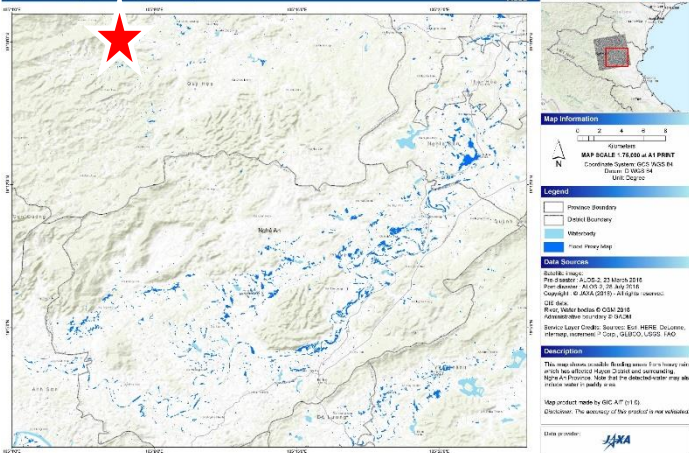
- ❖ Rains + flood discharge from hydro power plants
- ❖ Most of the counties were affected





Tan Hop commune, Tan Ky county





Chau Cuong commune, Quy Hop county



❖ The storm has cut off access to several areas



❖ 4 communes (Chau Hong, Chau Tien, Chau Cuong, Chau Thanh) in Quy Hop county were totally disconnected by roads

















A use case in Nghe An province, Vietnam

- ❖ Tropical storm Son Tinh (19-21, July, 2018):
 - ✓ Caused severe floods and debris flows, killed 36 people, several missing
 - ✓ More than 5,000 houses were damaged, swept away or collapsed
 - ✓ ~ 82,000 hectares of crops were damaged
 - ✓ nearly 17,000 animals were killed

- ❖ Nghe An province: only 1 injured

A use case in Nghe An province, Vietnam

❖ A month later: Storm Bebinca (17-21, August, 2018)

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ERVNMN000049	18/Jul/2018	Vietnam	Flood			link	ADRC	Active
ERVNMN000048	23/Jun/2018	Vietnam	Flood			link	ADRC	Active

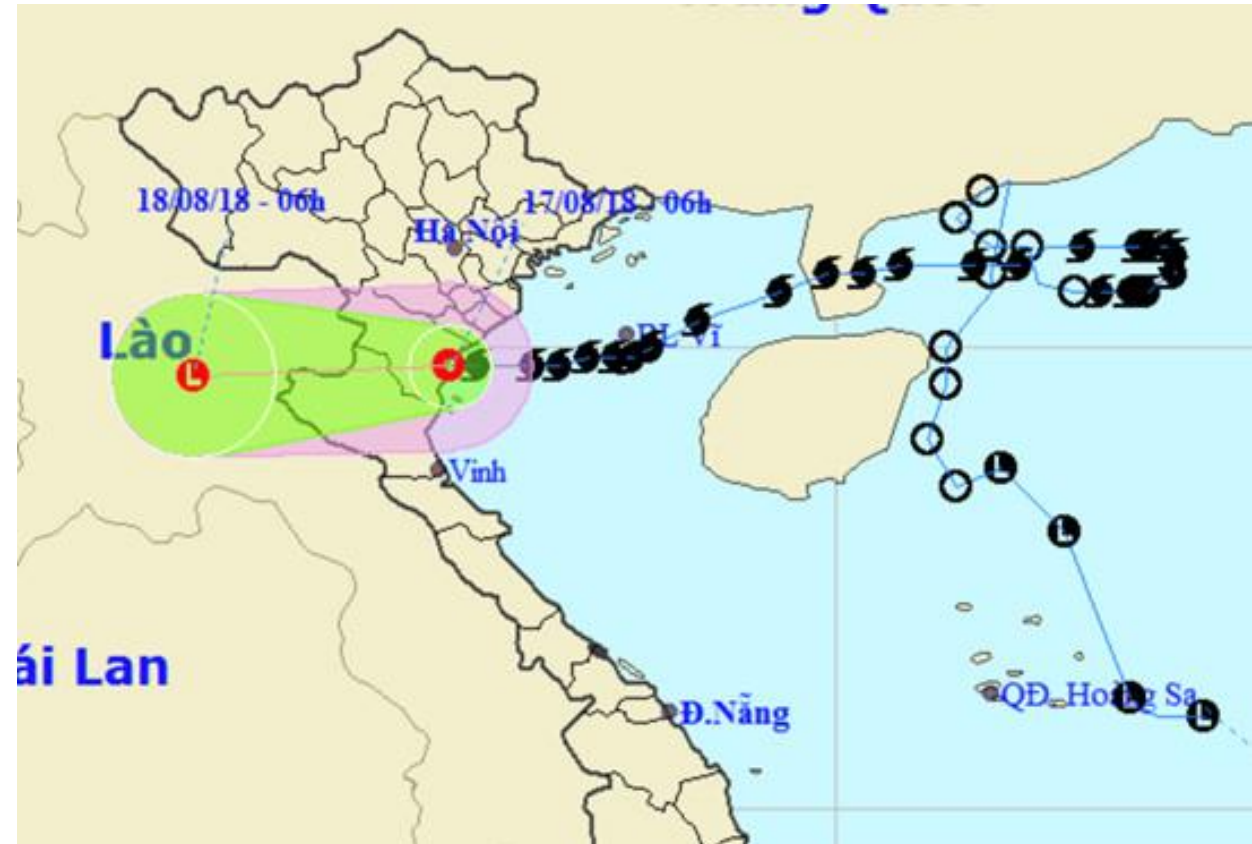
Storm track





A use case in Nghe An province, Vietnam

- ❖ Storm Bebinca (17-21, August, 2018):
 - ✓ Landfall in Vietnam → The storm was weakened into a tropical depression
 - ✓ Nationwide: 10 people died, 3 missing
- ❖ Nghe An province: 6 deaths, over 2,000 houses were damaged/collapsed



A use case in Nghe An province, Vietnam

❖ SA's maps and other EO products:

- ✓ Estimate the number of affected households/people
- ✓ Find priority areas for relief supplies

❖ In Vietnam, natural disaster prevention and control are carried out under the “four on-the-spot” motto:

- ✓ Command on the spot
 - ✓ Manpower on the spot
 - ✓ Means and supplies on the spot
 - ✓ Logistics on the spot
- ➔ Communities themselves are first responders

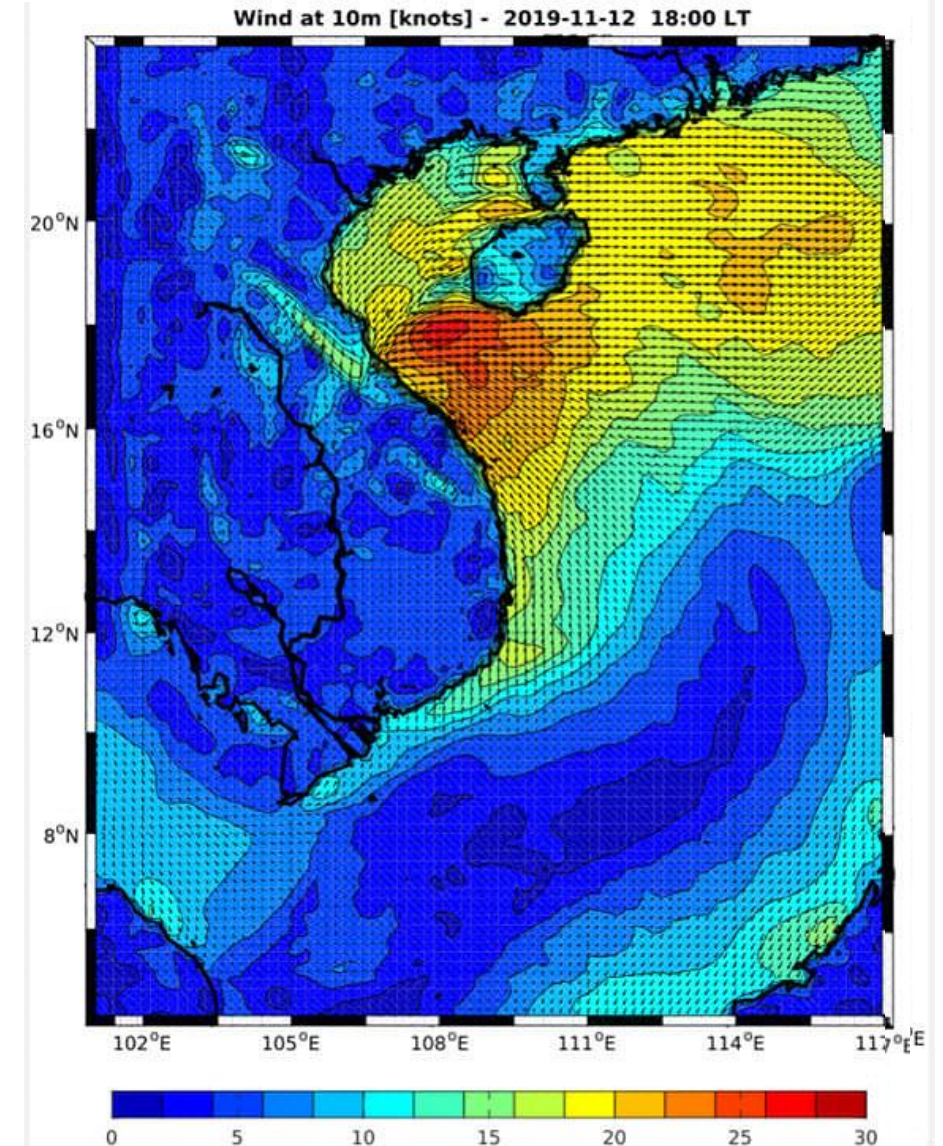
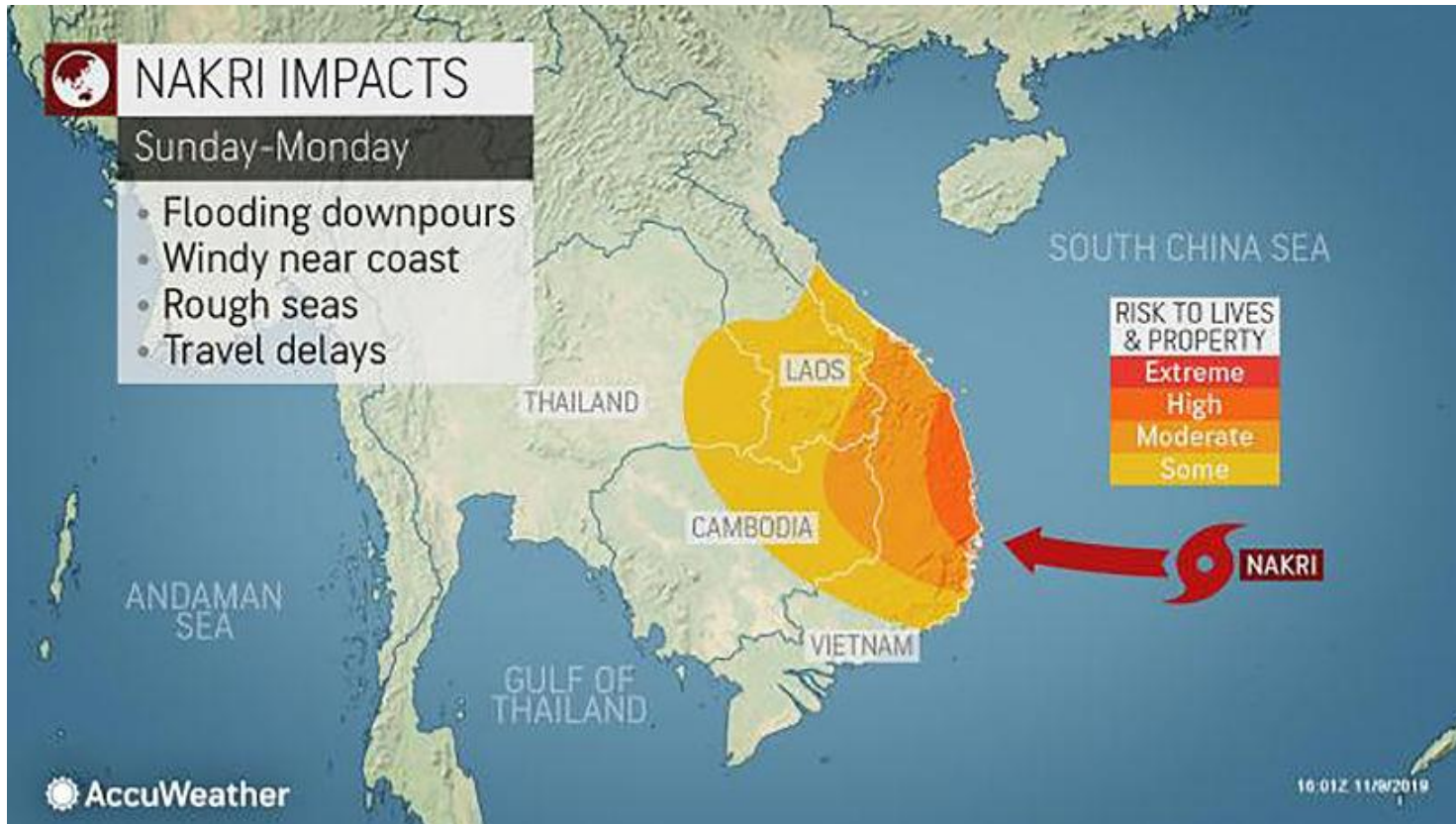


CONTENTS

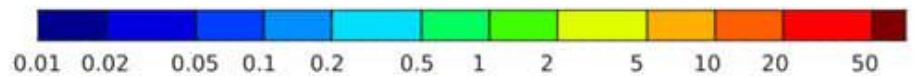
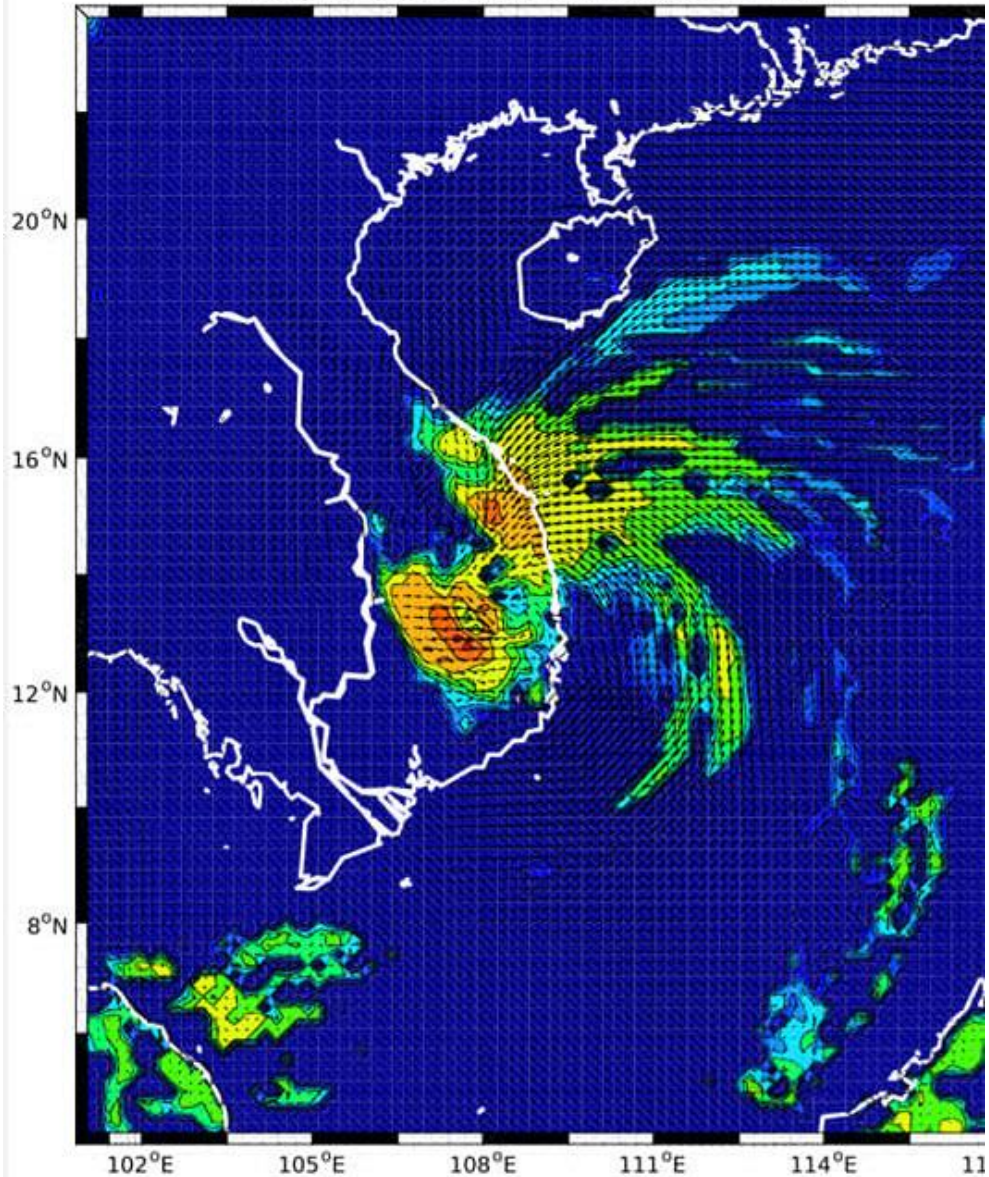
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Looking beyond

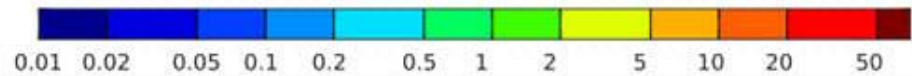
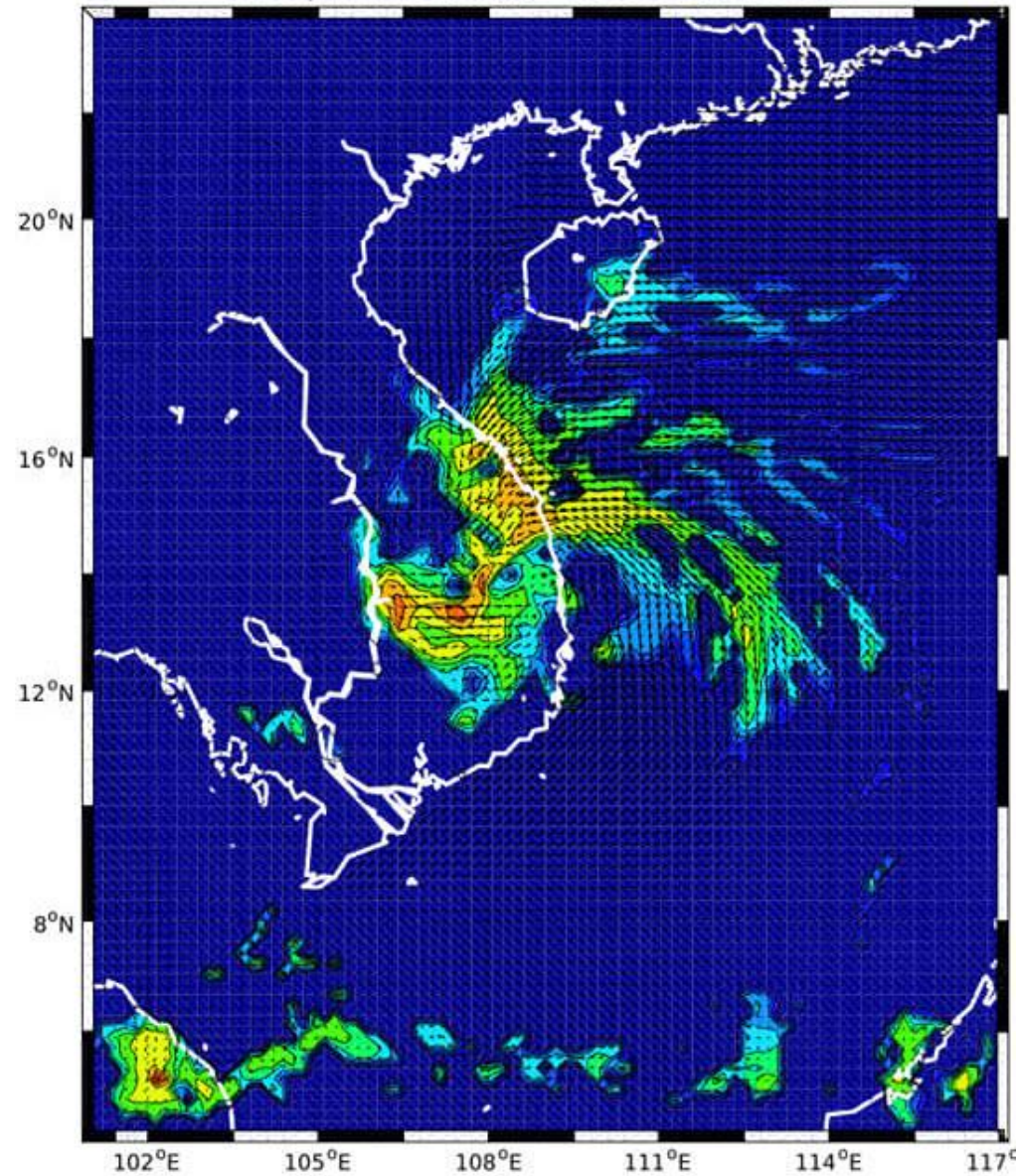
- ❖ Nakri storm (10-13/11/2019): Category 5, wind speed as high as 120kph at its epi-center



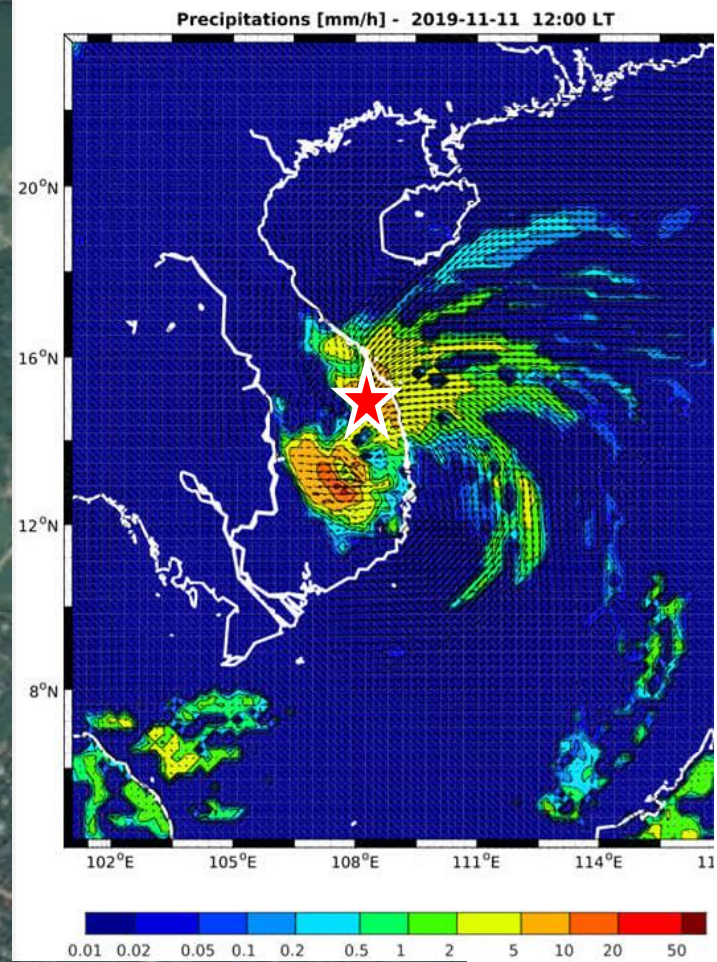
Precipitations [mm/h] - 2019-11-11 12:00 LT



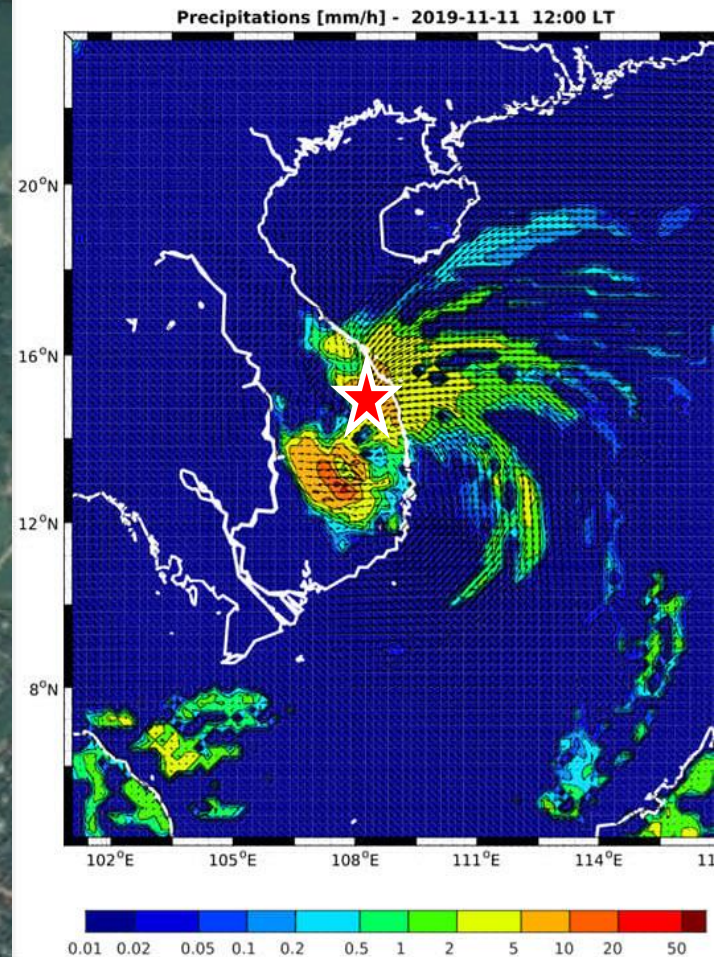
Precipitations [mm/h] - 2019-11-11 18:00 LT



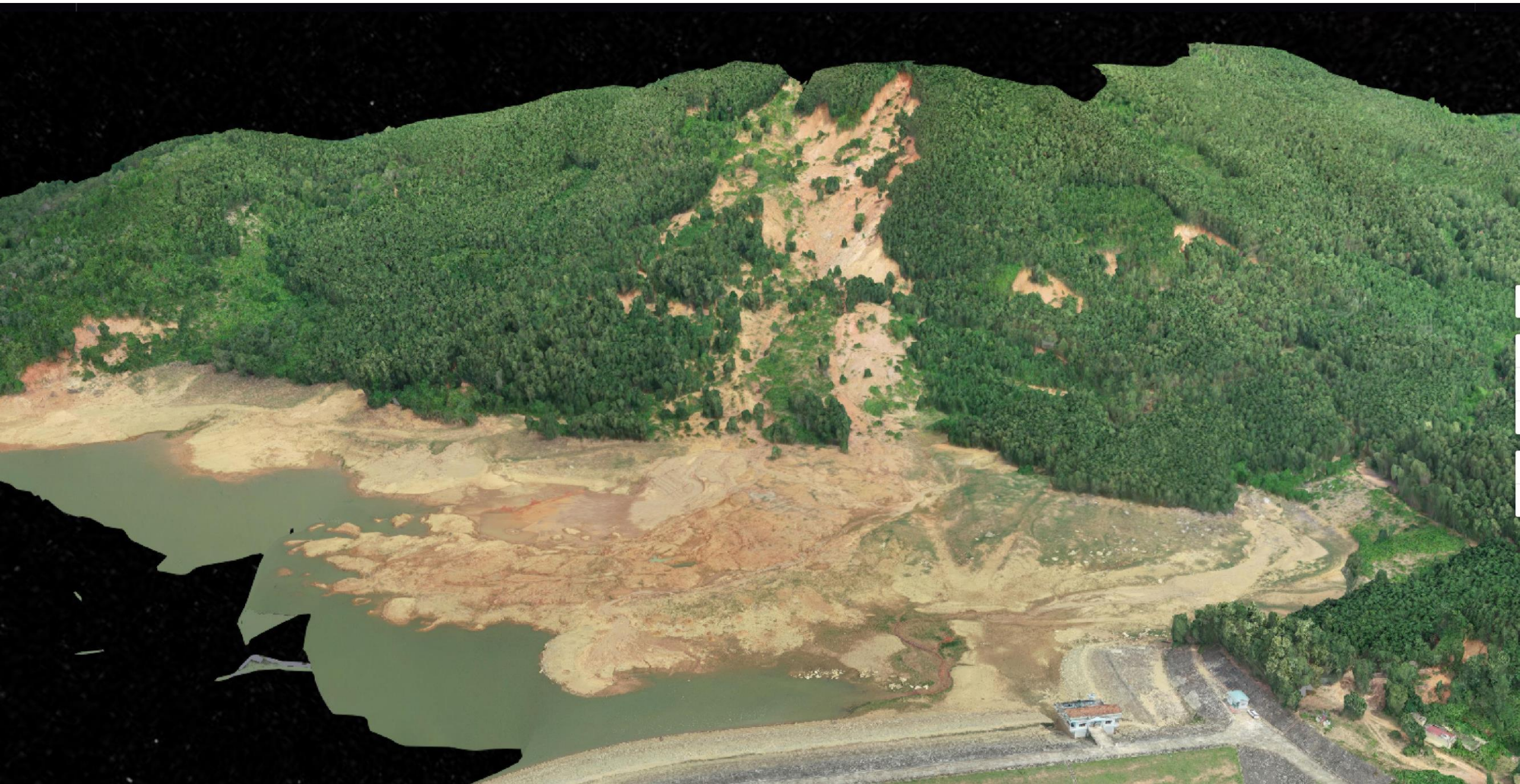
Van Hoi dam



Landslide (2016~)



- ✓ Generated big waves, ~15-20m high, overflow the dam
- ✓ Destroyed flood outlets and the breakwaters after the dam

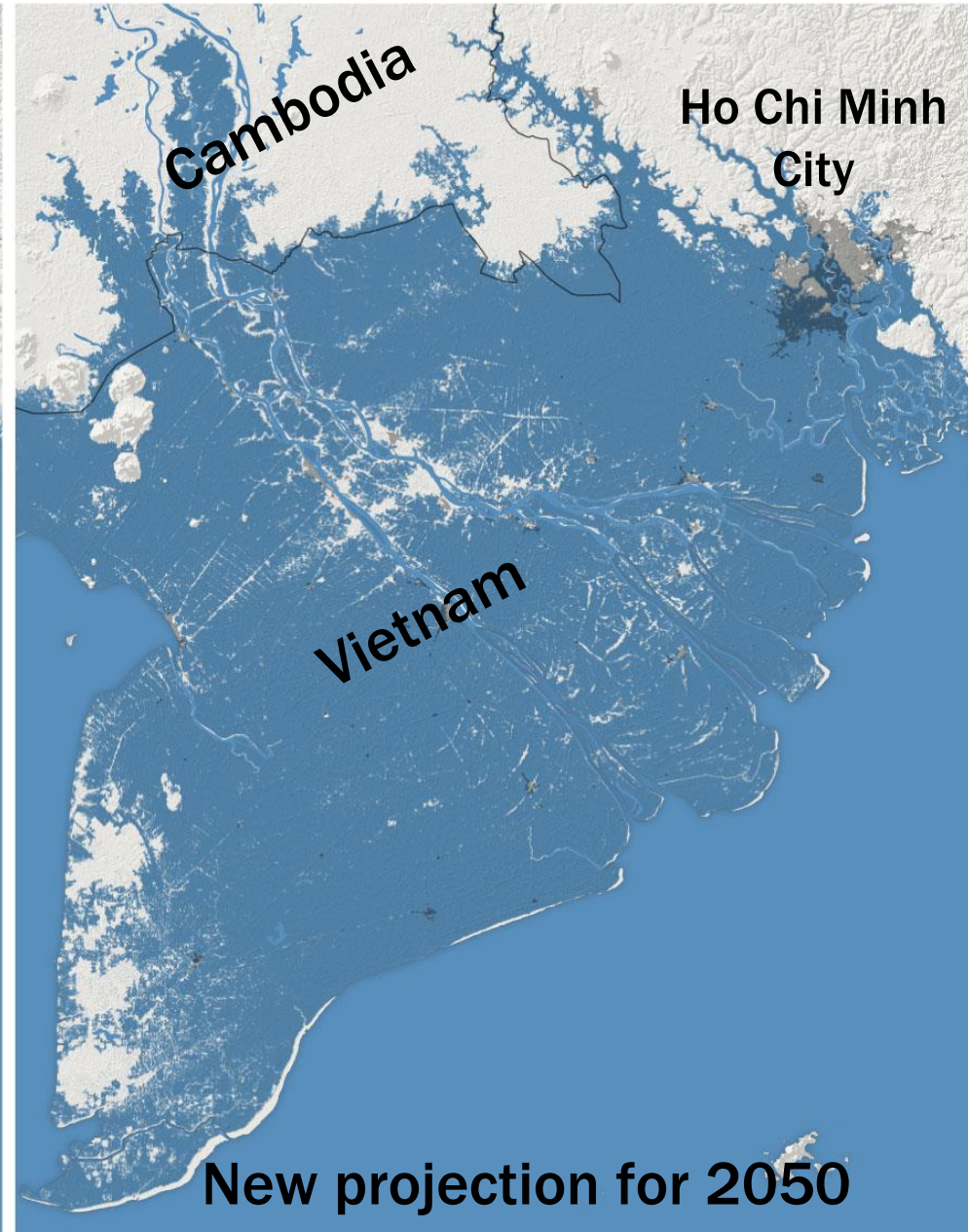
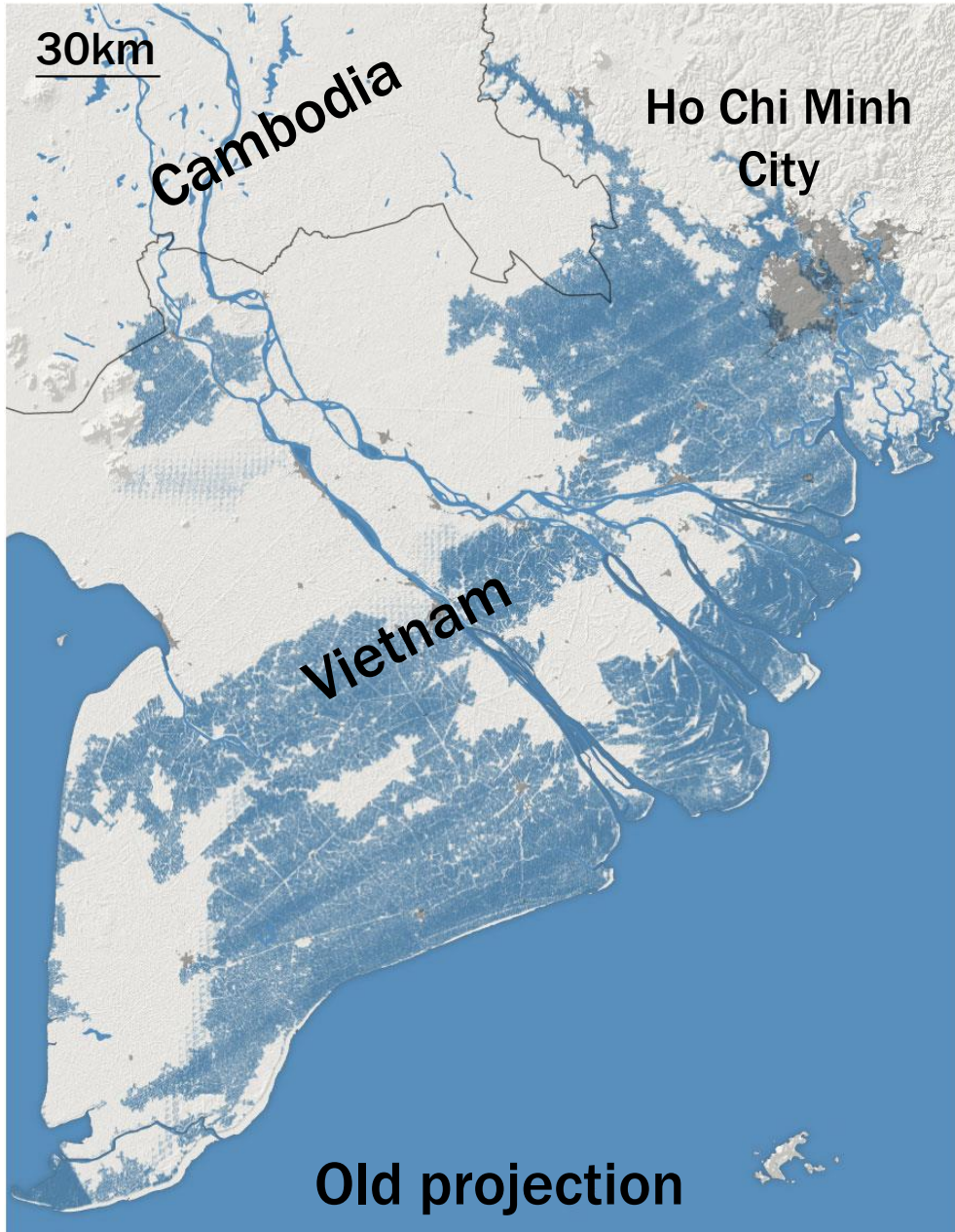


@Pham Van Tien, 2019

■ Land under water
at high tide

■ Cities

@Climate Central, 2019



2m sea
level rise

❖ Heavy rain from 2nd to 3rd
August 2019



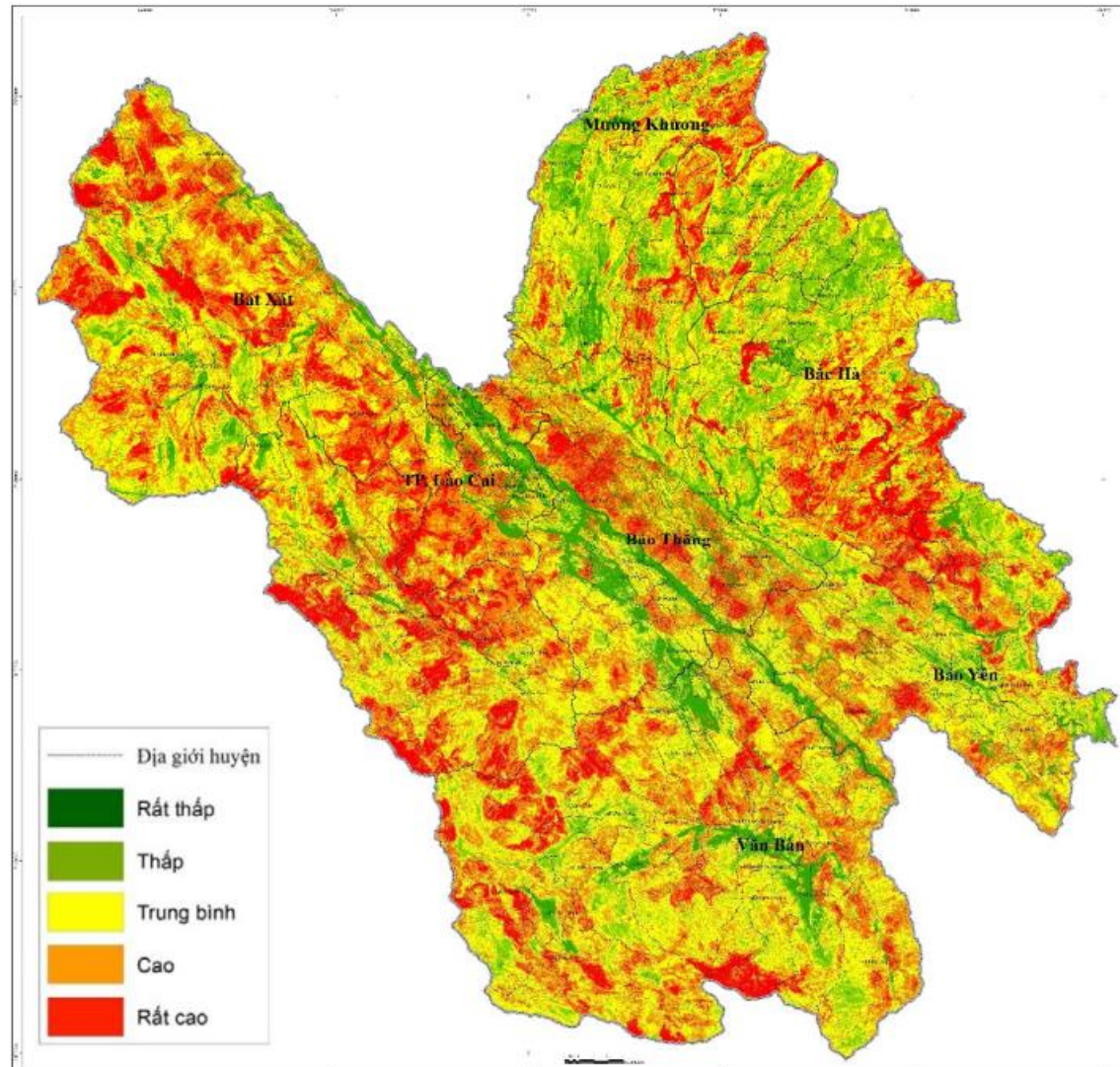
❖ Flash flood/debris flow swept 20
houses and killed 17 people in 1
village

Looking beyond

- ❖ We are very successful for big disasters: Floods, volcanos, earthquakes
 - ➔ Debris flows/landslides, much smaller in size but very devastating events, more critical for human loss

- ❖ Research Institute/University: Human resources, time
 - Continuous training of young professionals: Online videos (e-learning)
 - Bring mini projects back: Mini projects are very handful for practical use as research topics (Master students)

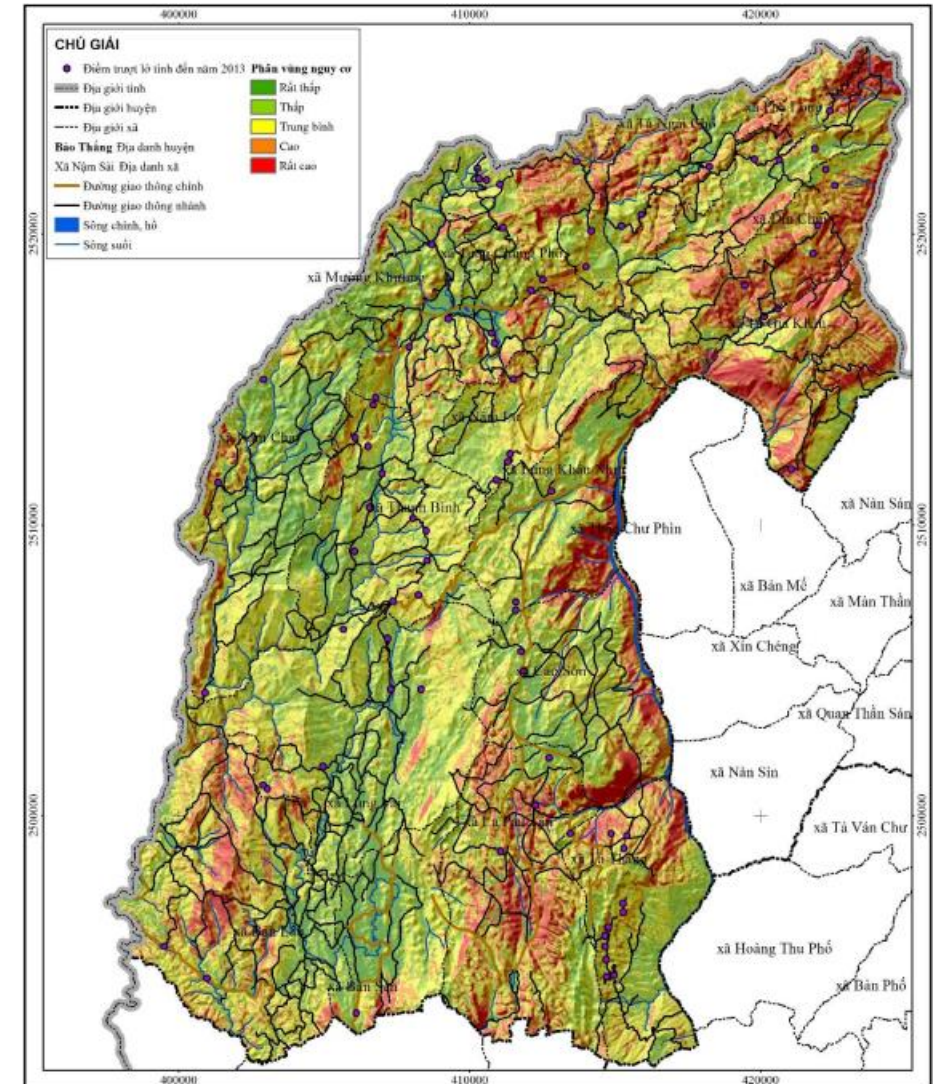
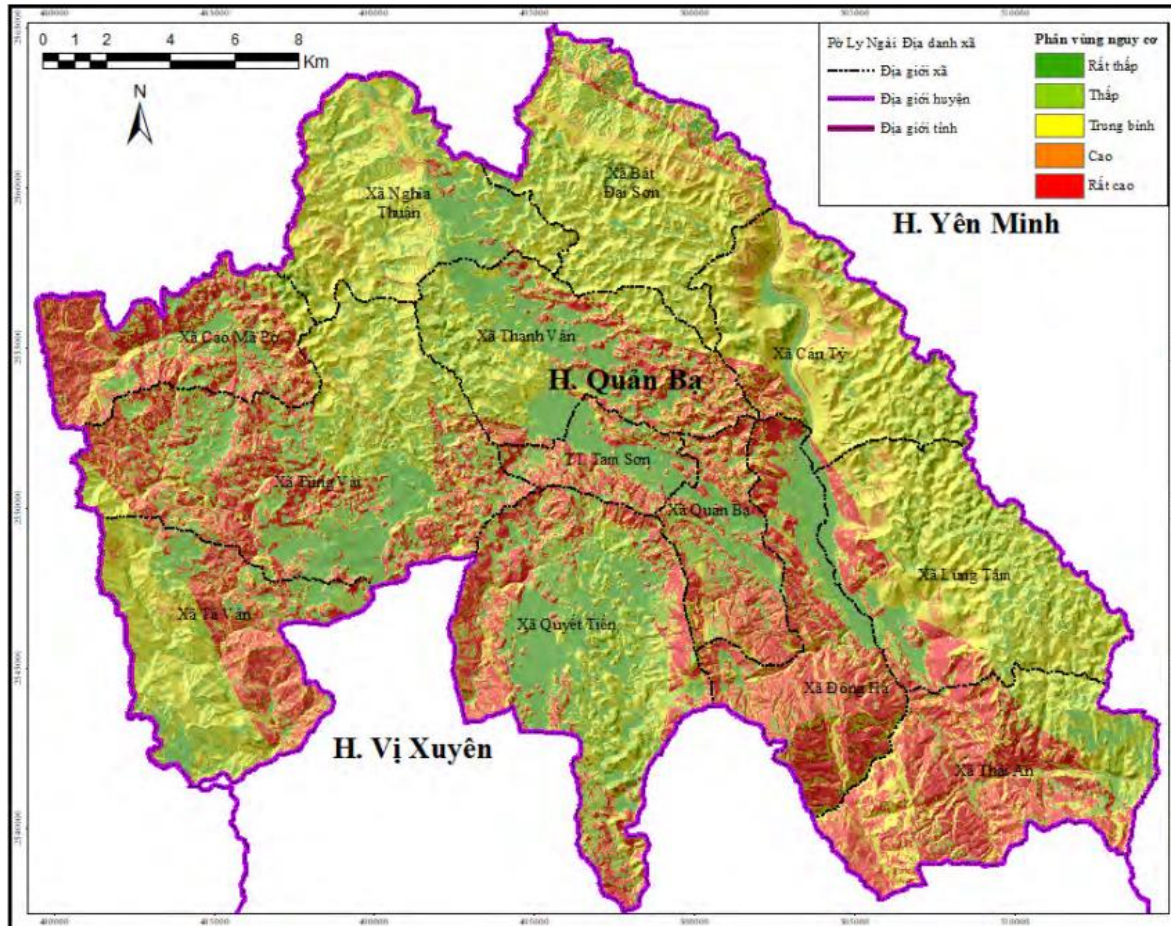
Landslide investigations



Landslide hazard map of Lao Cai province (1:50.000)

Landslide investigations

- 1:10,000 scale for specific areas
(220 communes)

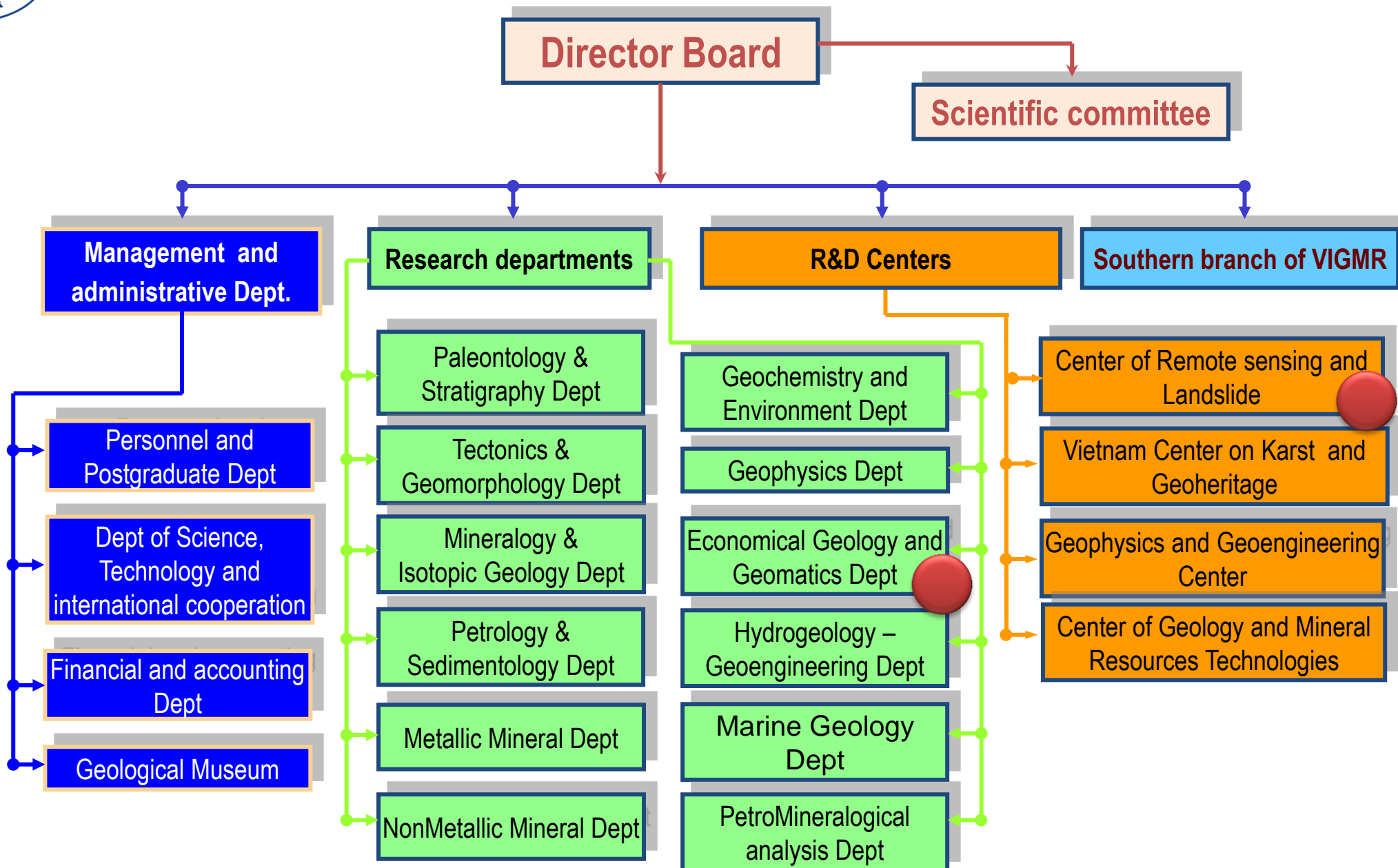


Looking beyond

- ❖ Improve the usage of SA's information by easier way to access to archived data
 - ❖ Local DAN/researchers can prepare pre-disaster scenario for critical sites (dams, hazard prone areas, economic hubs)
 - ❖ Support rapid analysis, otherwise, the information will not be emergency anymore
- ❖ Get the product usage at community level: by community needs, not only the authorities
 - ✓ Map scale, more details, understandable information
 - ✓ Ground validation for the final products: Local assessment for field verification, information from social media (FB, Zalo, Viber, etc.)



VIGMR Organization





On-going projects in VIGMR



Geohazards: Investigation, assessment, and warning zonation for landslides in the mountainous regions of Vietnam (~ USD 30 millions, 2012-2020) .

Objectives

The establishment of a **standard national database** on landslides, and generation of **landslide hazard maps** at scales of 1:50,000 and 1:10,000 for 37 mountainous provinces

The design of an **Early Warning System** for landslides, and implementing that in a number of landslides prone areas

Developing **community based Landslide mitigation network** in the whole country

Responsible for Landslide and Debris flow forecast on National TV when there is tropical typhoons or heavy rainfalls.

International cooperation for capacity building and technology transfer



COOPERATION and CONTRIBUTION to SENTINEL ASIA



- **Existing international cooperation on landslide and geohazards:**
 - ICL (Japan), NGI (Norway), BGS (England), ITC (Holland), NTU (Taiwan), DMR (Thailand)
- **VIGMR is willing to be DAN (requirements)**
 - Share experiences with other countries
 - Open to new cooperation
- **Areas of cooperation**
 - New technologies (48-hour rainfall forecast, high resolution RS image)
 - Capacity building
 - **Land subsidence in Mekong Delta**



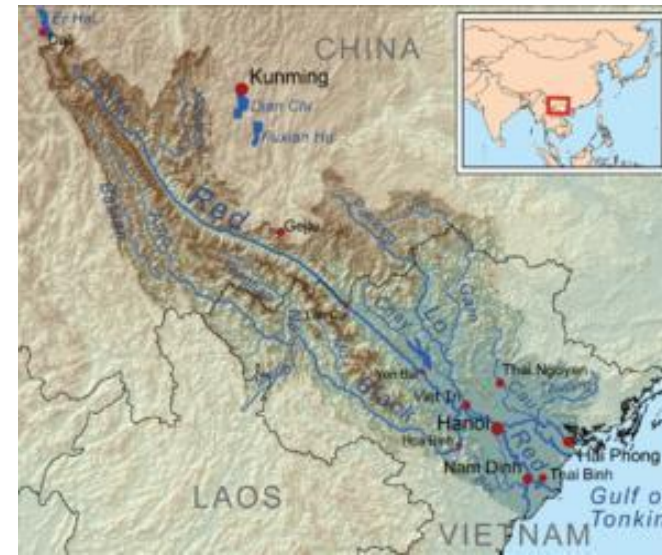
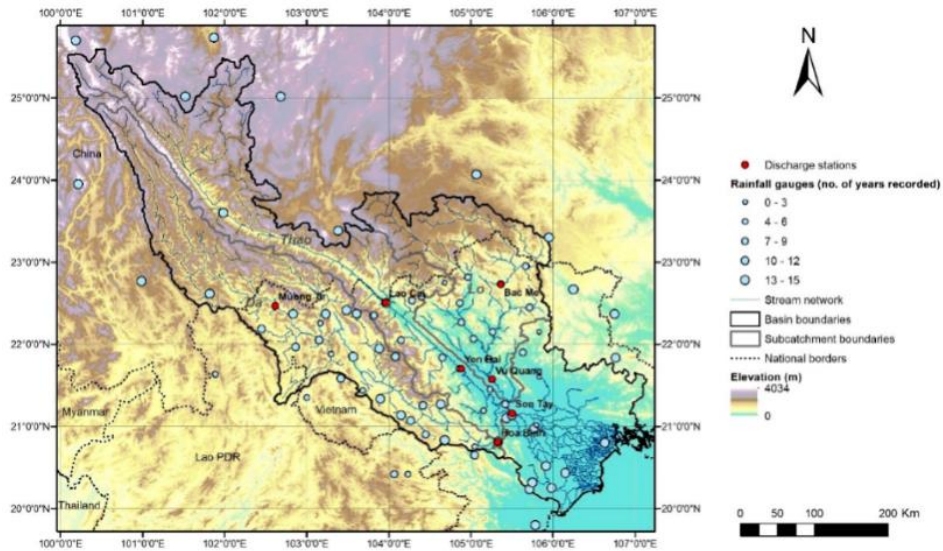
Faculty of Environment Hanoi University of Mining and Geology (HUMG)

❖ Willing to
become a
member



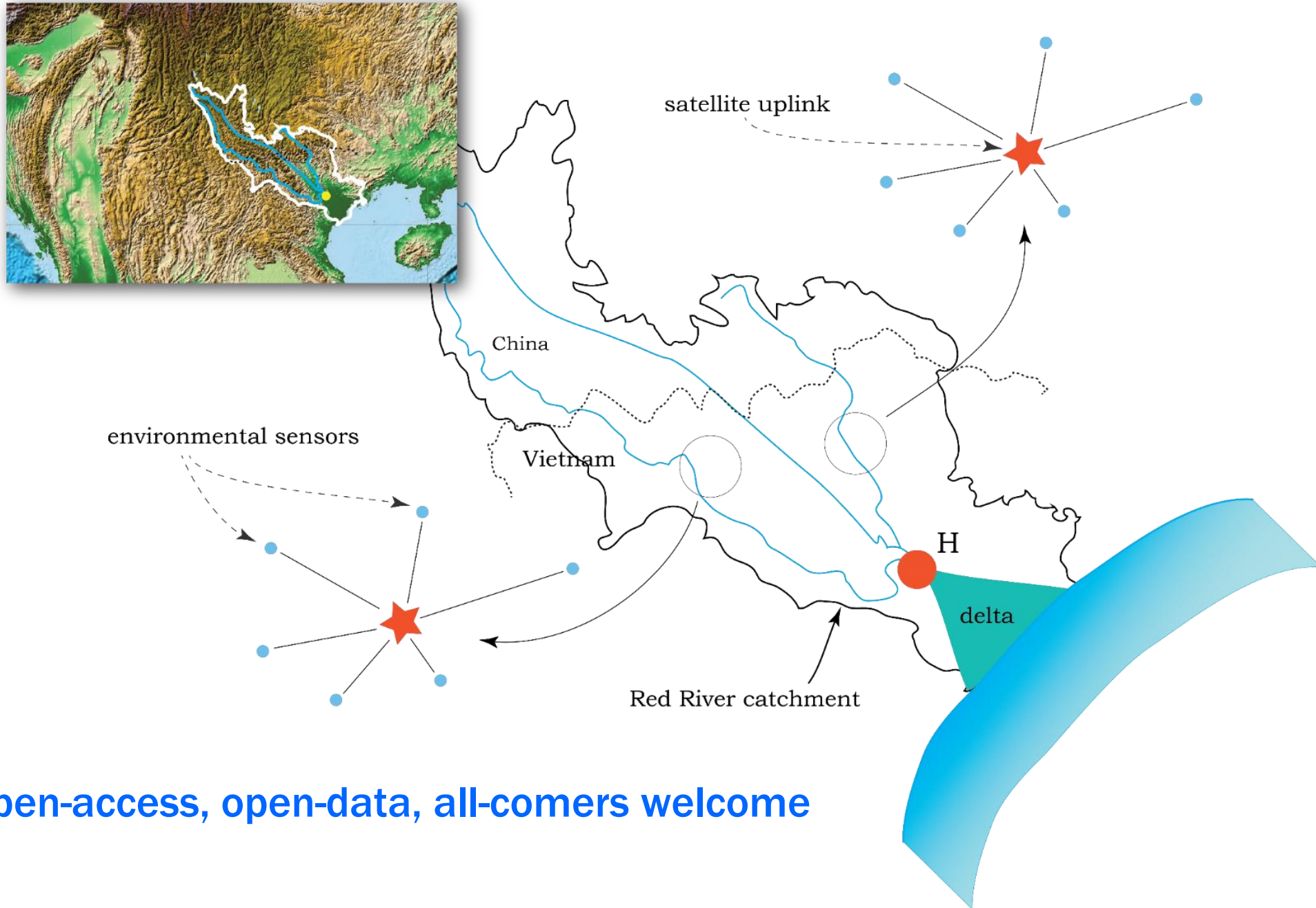
Multi-hazards and Resilience (MHR) Observatory for Hanoi region

VIGMR (VN) - BGS (UK)



Red River catchment
(shaded areas)

- ❖ Multi-hazards and resilience in hyper-expanding cities and their catchments
- ❖ Community based networks for disaster inventory
- ❖ Capacity building for disaster response, especially at commune level



❖ Open-access, open-data, all-comers welcome

<http://viww.vaci.org.vn>

VACI - Global Waterhub for Vietnam and the region

VIETNAM IN INTERNATIONAL WATER WEEK - VACI2020

Conference - Exhibition - Business Connect - Social Networking

A Special Edition for Vietnam's ASEAN Chairmanship 2020

Hanoi, 22nd - 25th March 2020



**WORLD
WATER DAY**
MARCH 22



Vietnam International
WATER
Week 22-25 March, 2020
Hanoi, Vietnam



Water, Environment and Ecosystem Services (HIW 1-5)

❖ Celebrate 10 year anniversary (2010-2020)

➤ *The 3rd Conference on Environmental Management and Natural Resources Development (EMNR 2020)*

✓ **Time:** March 25th, 2020

✓ **Location:** HUMG

<http://env.edu.vn/EMNR2020>



CONFERENCE ON ENVIRONMENTAL MANAGEMENT AND NATURAL RESOURCES DEVELOPMENT - EMNR 2020 -

Hanoi, 25 March 2020

Announcement and Call for Papers

With environmental degradation and climate change being the foremost challenges confronting human civilization, the protection of the environment and its sustainable management have become one of the top priorities. The 3rd Conference on Environmental Management and Natural Resources Development (EMNR 2020) aims to bring together engineers, scientists, researchers, students, managers and other professionals in order to address and discuss emerging environmental issues, especially in environmental management and natural resources development.

The year 2020 also marks the 10th anniversary of the Faculty of Environment (3/2010-3/2020), Hanoi University of Mining and Geology (HUMG). The EMNR 2020 is a special milestone of very successful EMNR series of conferences and is organized to commemorate this historic event. The Organizing Committee of the EMNR 2020 is honored to invite you to participate and contribute to the success of this remarkable event. The EMNR 2020 Conference will provide an opportunity to learn about the latest methodologies and best practices in solving the hot issues in environmental management and natural resources development.

Main themes

The suggested topics are inclusive of but not limited to:

- ❖ Current Issues in Environmental Management and Natural Resources Development
- ❖ Emerging Technologies for Environmental Protection and Monitoring
- ❖ Environmental Impact Assessment and Sustainable Geo-Resources Management
- ❖ Recycling and Waste Treatment Technology
- ❖ Environmental Hazard and Risk Assessment
- ❖ Environmental Modelling and Management Tools
- ❖ Environmental Education and Communication
- ❖ Environmental Security and Safety Issues

Important dates

Abstract submission: 15th October, 2019

Abstract notification: 30th November, 2019

Full text submission: 15th January, 2020

Program announcement: 30th February, 2020

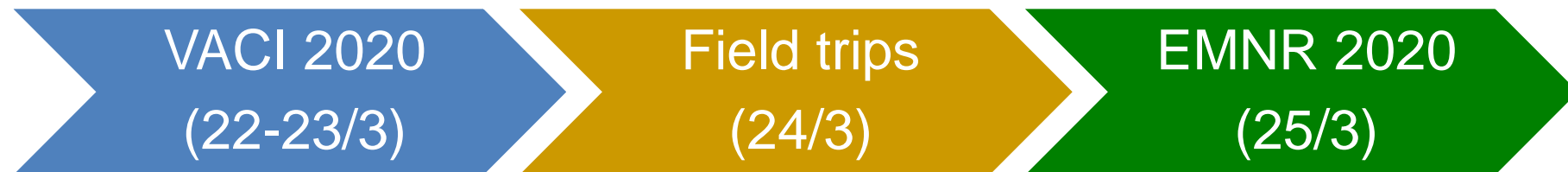
Registration: 10th March, 2020

Conference: 25th March, 2020

Timeline

❖ Events:

- VACI 2020: *March 22-23rd*
- Field trips (Ha Long & Trang An): *March 24th*
- EMNR 2020: *March 25th*



- *Save your time & check your calendar!*
- Discussion, exchange ideas and networking!



Thank you!