



Decision Support System for Flood Management for Bangkok Metropolitan Administration , Thailand



Mr.Arsa Sukkhung

**Director of Drainage Information System Division
Drainage and Sewerage Department**

Project Background and Objectives



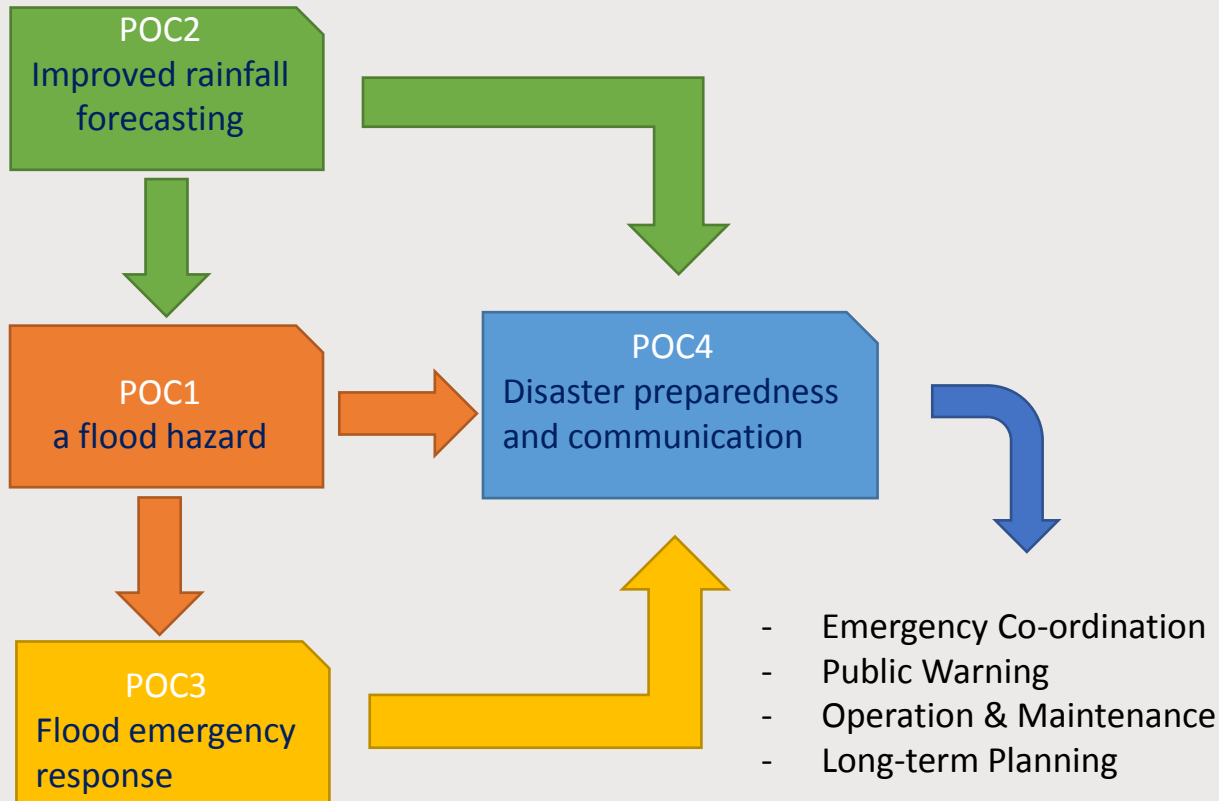
- ① Bangkok is subject to intense localized rainfall resulting in flooding, traffic disruption and economic losses
- ② Bangkok Metropolitan Administration (BMA) is responsible for urban resilience, including flood management
- ③ BMA are seeking a new Decision Support System (DSS) for flood management to:
 - ✓ Help predict, prepare and respond to flooding with proactive and evidence-based approach
 - ✓ Combine the latest digital technologies with hydraulic models to enhance existing flood management practices
 - ✓ Inform and justify flood management decision-making

Desired outcomes and impacts



- ① Support the development of a Management Information System (MIS) to more effectively forecast floods taking into account climate change and expected rainfall.
- ② Optimizing the Flood Control Centre to accurately predict the impact of a forecast flood to areas within the metropole with a high level of geographical granularity.
- ③ Improving BMA's institutional capacity by putting decision support systems in place that will institutionalize the knowledge of experienced personnel.
- ④ Providing evidence-based data to improve building regulations and protect green areas within BMA that have high water retention to increase the metropole's resilience to floods.

Project Scope and Current Status



Proof of Concept 1

Development of a flood hazard

A Flood Model was developed for Lat Phroa study area to produce spatial flood information that can be presented as web-based, digital or printed maps.

Proof of Concept 2

Improved rainfall forecasting

- Further enhance the radar-derived Quantitative Precipitation Estimate (QPE) fields with local monitoring using a Vertical Profiling Radar (VPR) system
- Delivering operational radar nowcasting (Quantitative Precipitation Forecast – QPF)

Proof of Concept 3

Flood emergency response

We will use the flood model outputs developed in POC1 to provide recommendations on flood emergency response procedures in the Lat phrao study area.

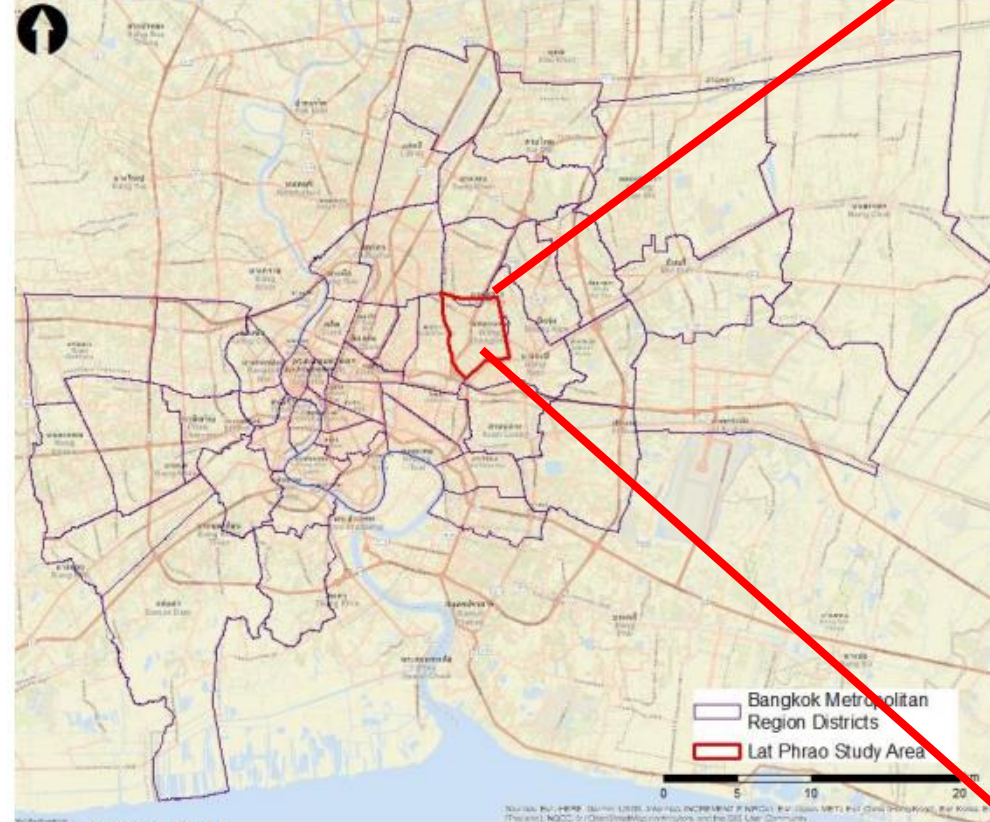
Proof of Concept 4

Disaster preparedness and communication

The results from POC 1 and 2 will be integrates into a web-based DSS application on the Moata platform.

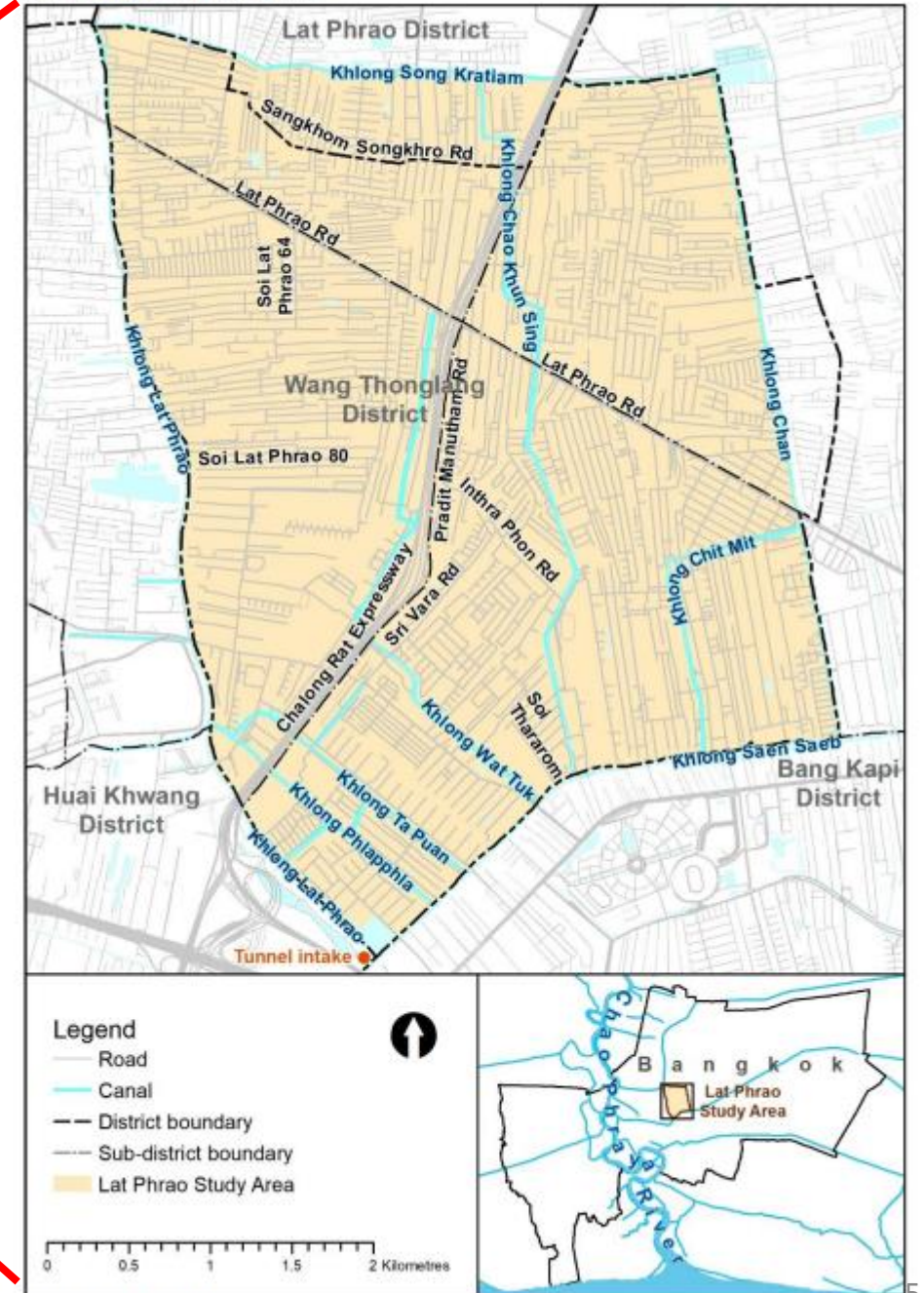
Project Scope and Current Status

Map 1.1: Lat Phrao study area



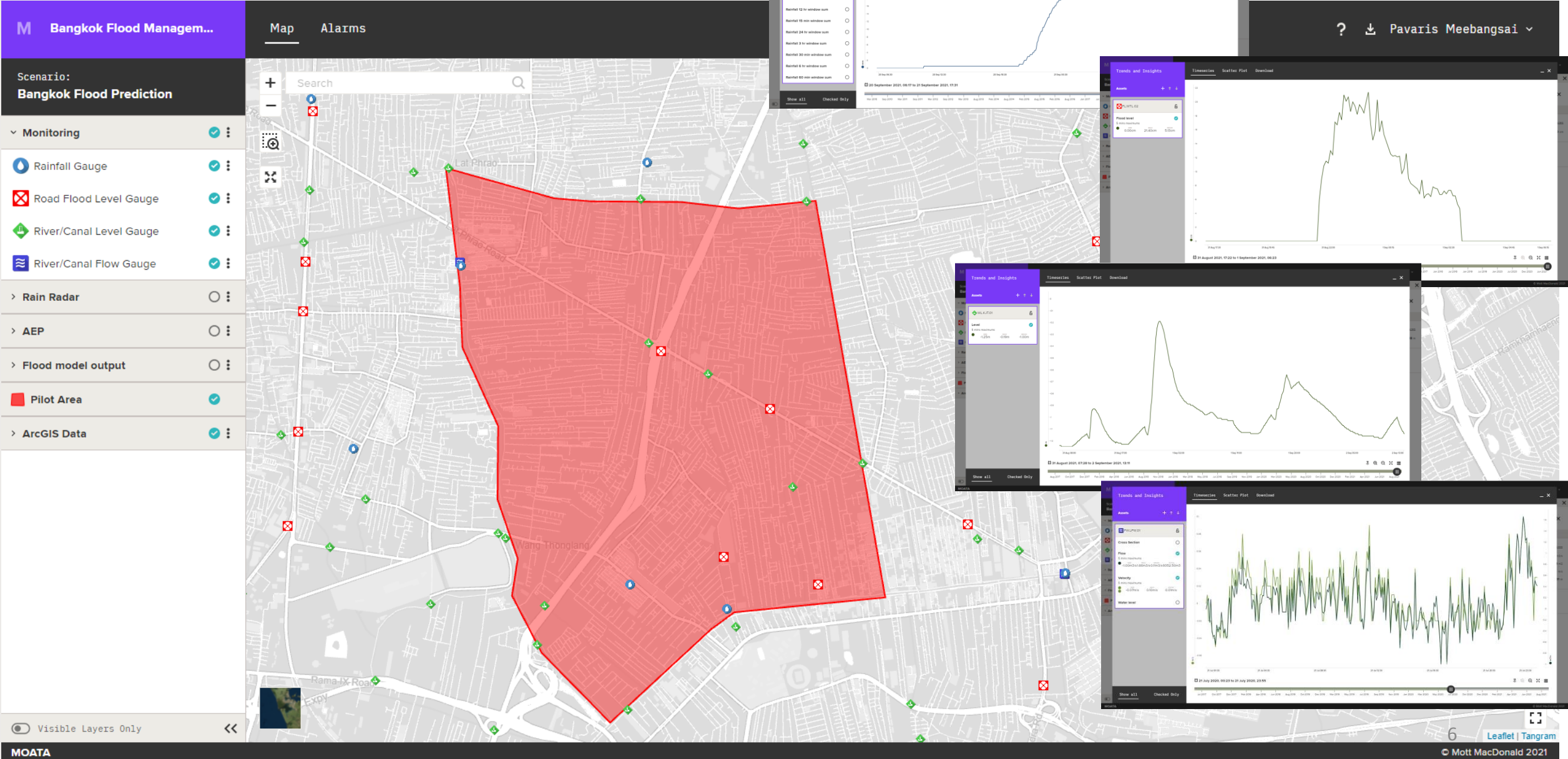
Source: Mott MacDonald

Map 2.1: Lat Phrao study area



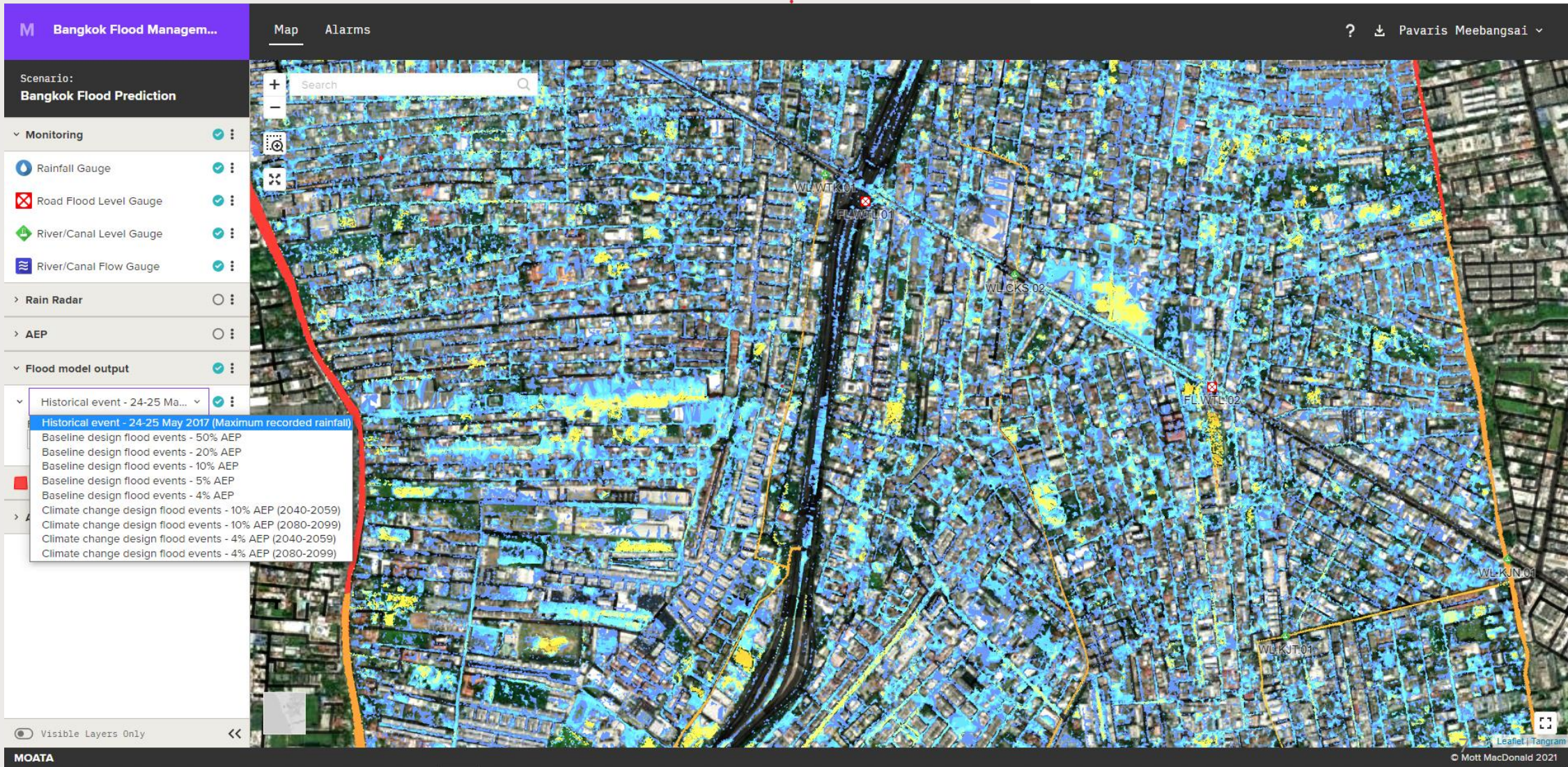
Source: Mott MacDonald

Project Scope and Current Status



Project Scope and Current Status

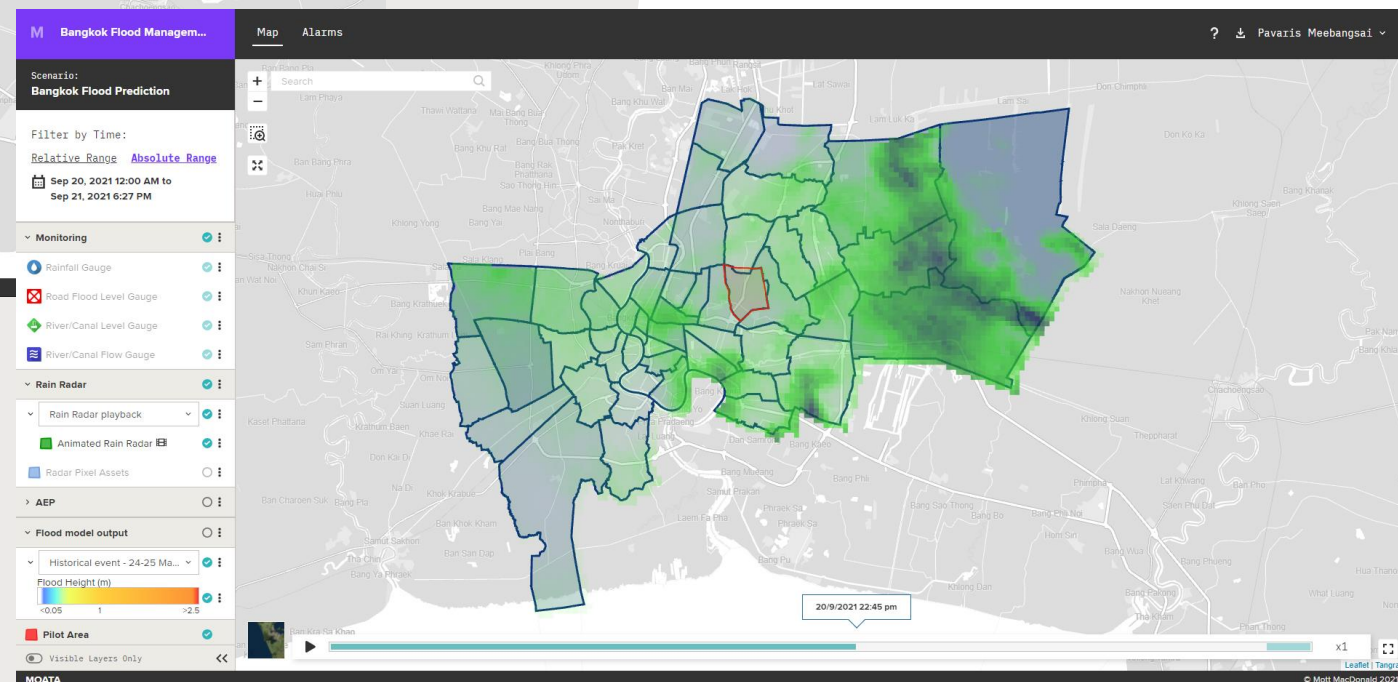
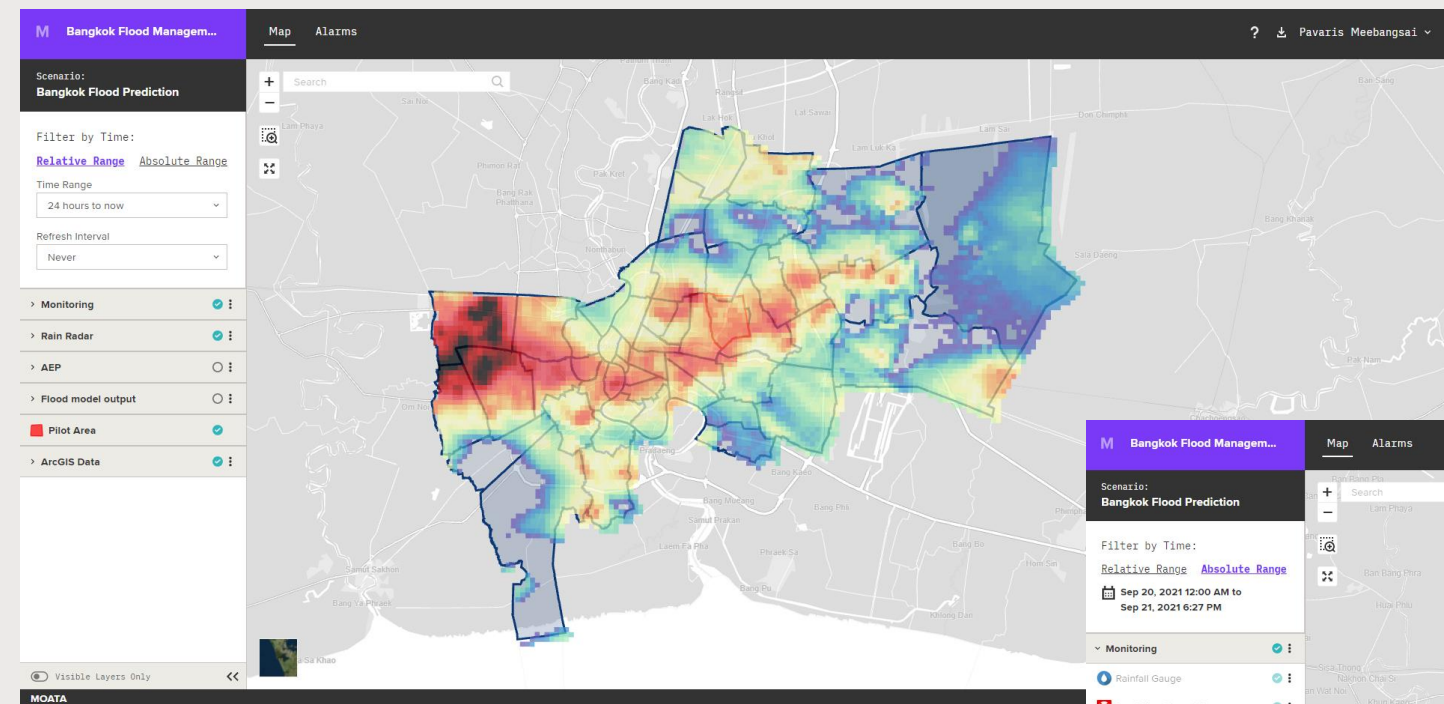
Flood Model Output



Project Scope and Current Status



rainfall estimation and forecasting (QPE/QPF) by a Vertical Profiling Radar (VPR) system

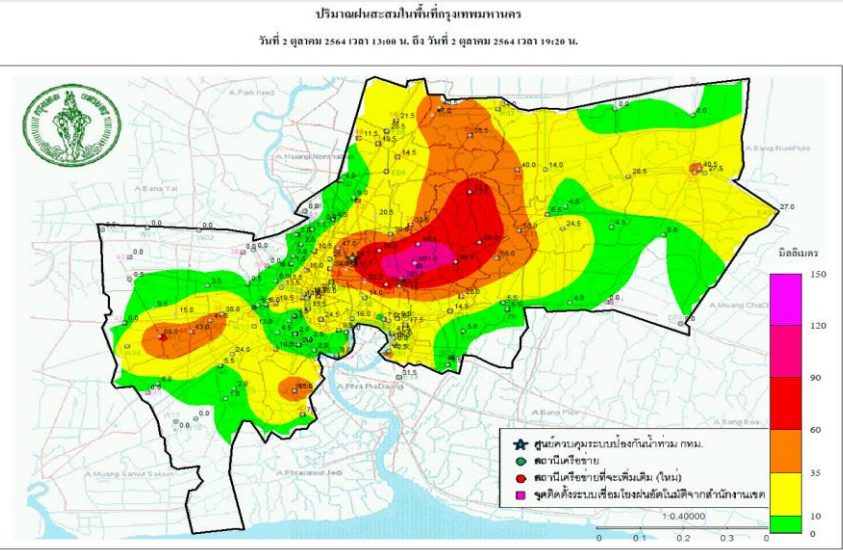


Project Scope and Current Status

Heavy Rainfall in Ladphrao area

Date 02 Oct 2021

Time 13:00 – 20:00



ศูนย์ควบคุมระบบป้องกันน้ำท่วมกรุงเทพมหานคร
กองสารสนเทศระบายน้ำ สำนักการระบายน้ำ กรุงเทพมหานคร
โทรศัพท์ ๐๒-๒๕๕-๕๕๕๕ โทรสาร ๐๒-๒๕๖-๐๒๐๐ EKK_BEST BKK.BEST
http://dds.bangkok.go.th E-mail: ddsbma@gmail.com

Summary of the rain situation on 2nd October 2021 (13.00 – 19.40)

Top 5 highest Rainfall (millimeter: mm.)

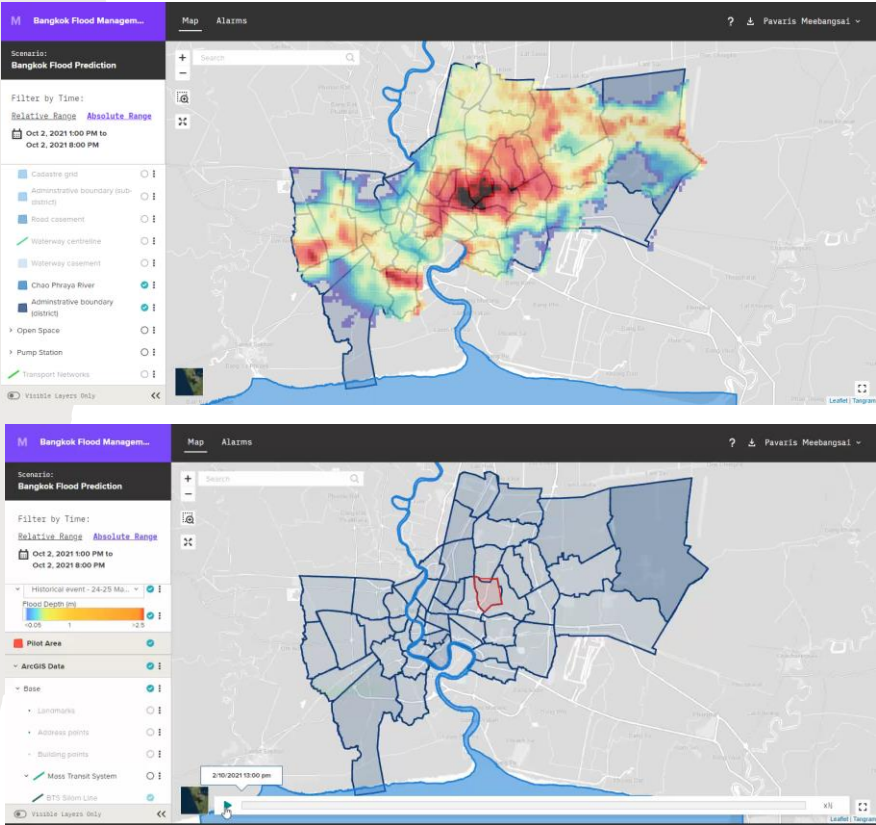
1. Khlong Chao Khun Sing Pumping station, Wang Thonglang District	101.0 mm.
2. Khlong Samsen – Saen Saep Pumping Station, Huai Khwang District	101.0 mm.
3. Bang Kapi District Office	90.0 mm.
4. Wattana District Office	79.5 mm.
5. Klong Lam Chala – Nawamin Road, Khan Na Yao District	72.5 mm.

Top 5 intensity Rainfall (millimeter per hour: mm./hr.)

1. Khlong Chao Khun Sing Pumping station, Wang Thonglang District	130 mm./hr.
2. Department Drainage & Sewerage, Din Daeng District	120 mm./hr.
3. Khlong 13 Water Gate, Nong Chok District	120 mm./hr.
4. Huai Khwang District Office	108 mm./hr.
5. Phayathai District Office	108 mm./hr.

Flood Reports

- Dindaeng District**
 - Huai Khwang Market, Pracha Songkhro Road
 - Tiam Ruam Mit Intersection, Ratchadaphisek Road
 - Soi Inthamara 53, Prachasuk Road
 - Din Daeng Tunnel, Din Daeng Road
- Wang Thonglang District**
 - Soi Ladphrao – Khlong Chao Khun Sing, Ladphrao Road
- Bueng Kum District**
 - Soi Nawamin 77 – Soi Nawamin 95, Nawamin Road
- Bang Kapi District**
 - Green Sport Company, Srinakarin Road
 - Soi Ramkhamhaeng 39 – Soi Ramkhamhaeng 65, Ramkhamhaeng Road

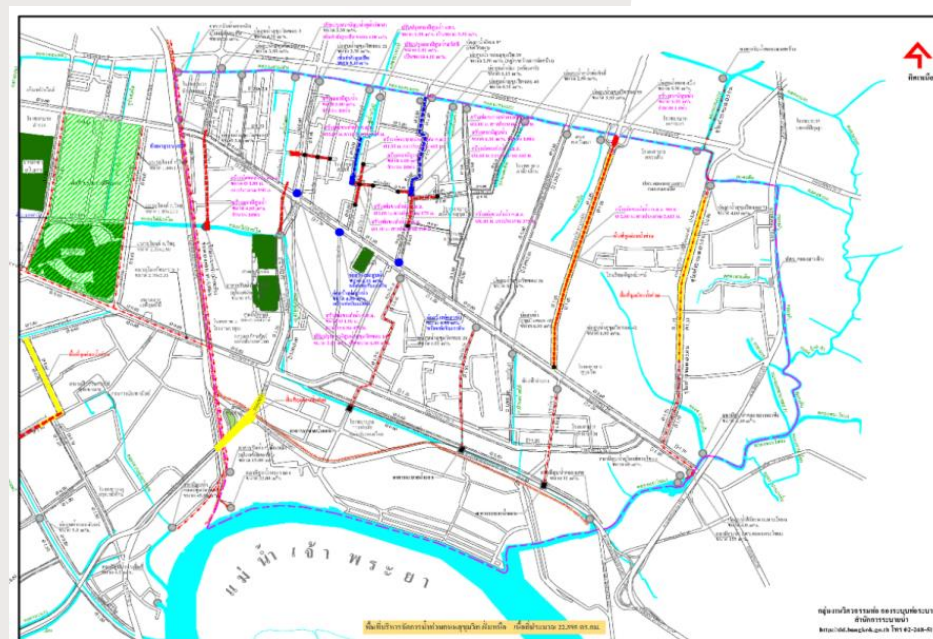


Reported by BMA

Challenges and Opportunities



- The climate change effects, uncertainly rainfall
- Personal capacity / Expert for flood modeling



Lessons learned and key risks



- Capacity building for official staffs in flood modeling.
- Flood modeling for water management in Bangkok area.
- Implementation plans/projects for flood management and forecasting system to warning people.
- Considering hydraulic data in flood control center and suggestion data which could increase.
- Flood emergency plan & Communication system for warning peoples.



Thank You.