



Delivering Smart Flood Management in Bangkok

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Bangkok Flood Management Decision Support System

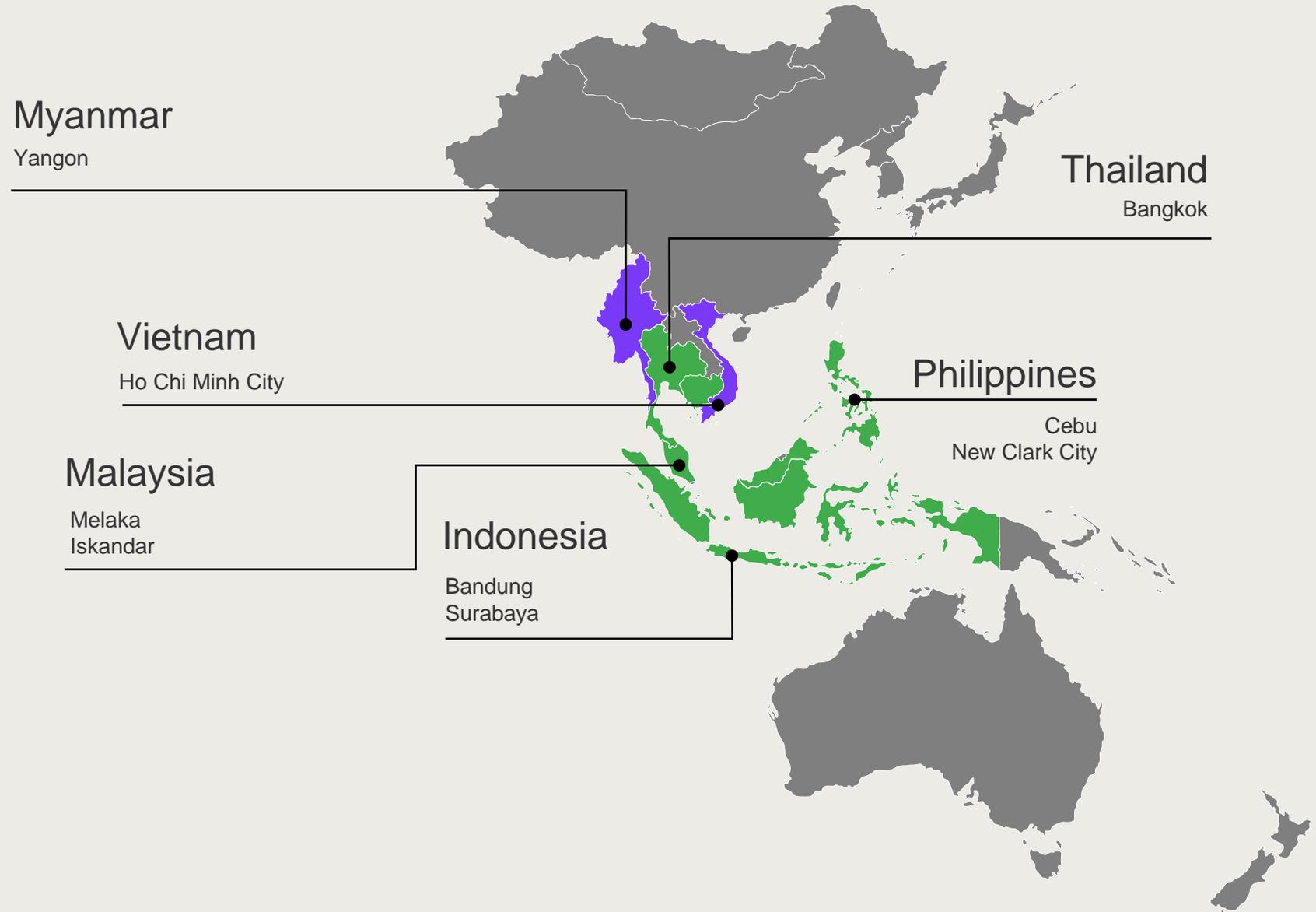
A global first real-time stormwater flood forecasting system that can accurately predict where and when flooding will occur

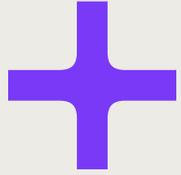


Global Future Cities Programme

South East Asia

- 13 projects
- 9 cities
- 6 countries
- 3 years

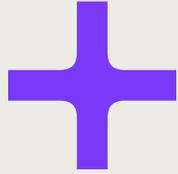




Bangkok flood context

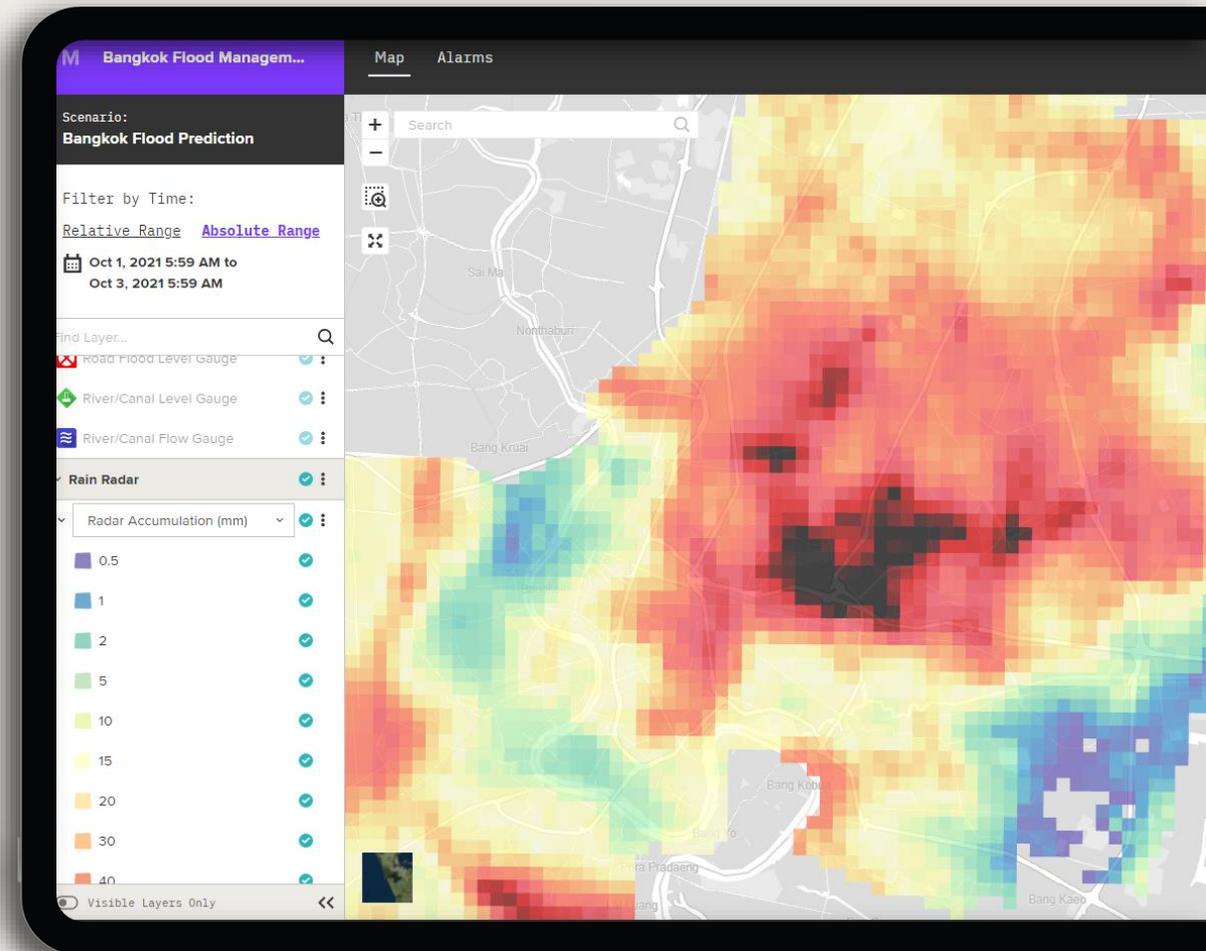
- Intense, highly localised tropical rain events causing frequent stormwater flooding
- Flat and highly urbanised
- Operational response is reactive

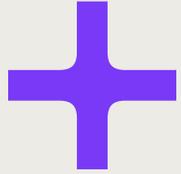




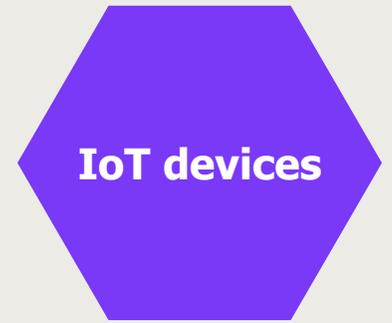
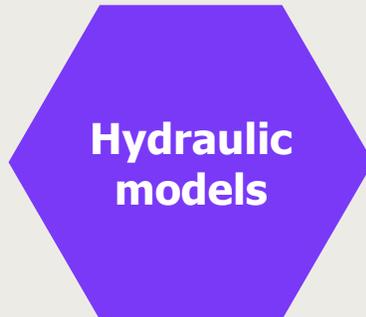
Flood Management Decision Support System

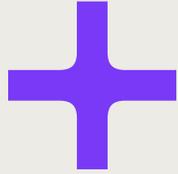
- Targeted rainfall radar network improvements
- Machine learning to overcome the limitations of hydraulic models
- Integration of sensor data, rainfall and flooding predictions and alarming in Moata





Bangkok's current flood management





Flood Management Decision Support System

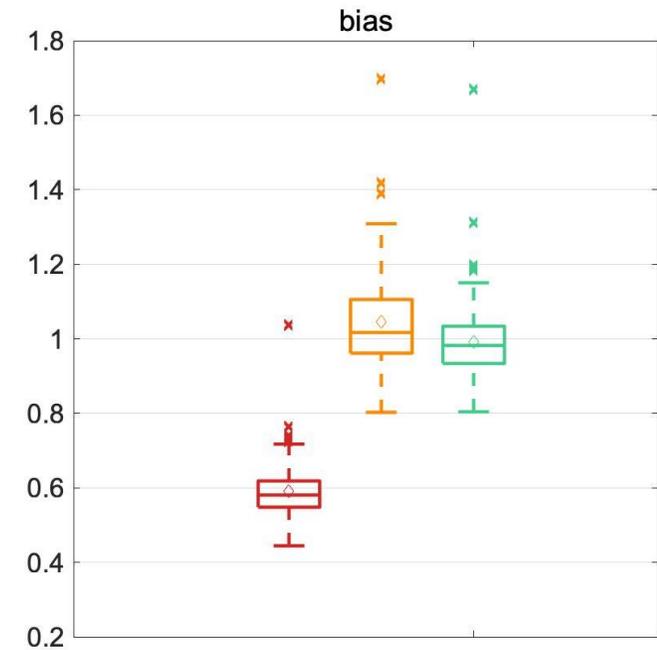
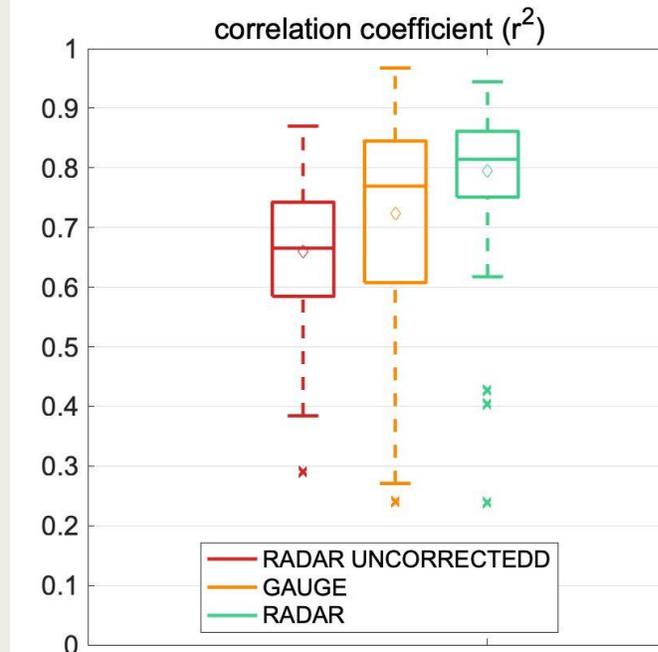
Domain knowledge
Digital expertise

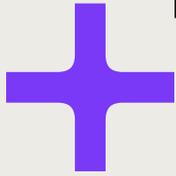




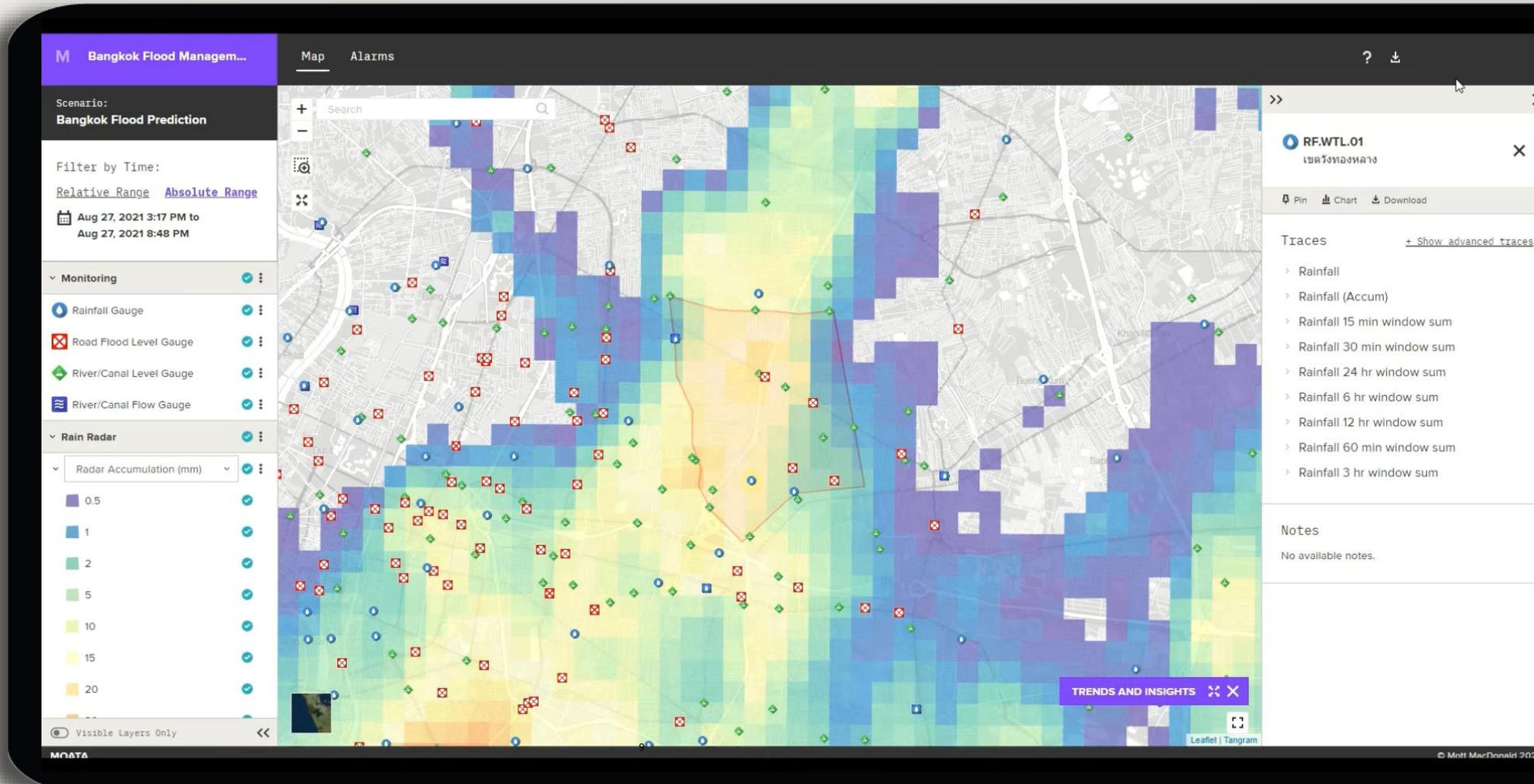
Rainfall radar improvements

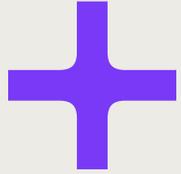
- Vertically profiling radar
- Continuous calibration
- Automatic rainfall maps & animations
- Nowcasting





Rainfall radar in Moata interface

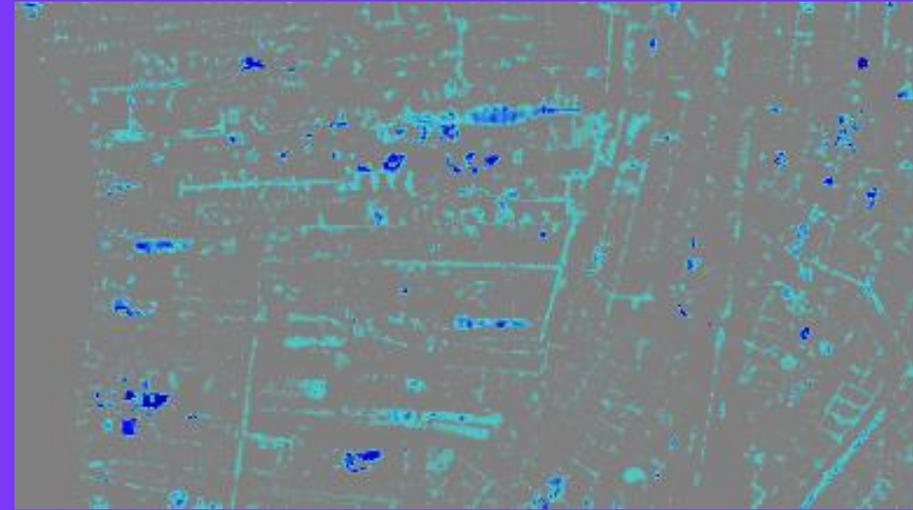




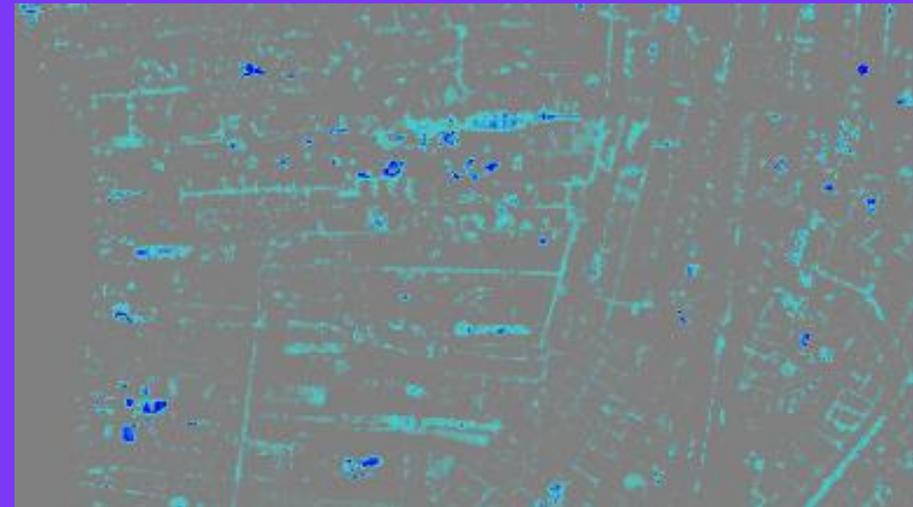
Machine learning surrogate model

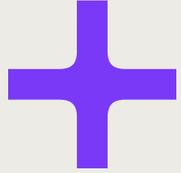
- Real-time stormwater flood forecasting – a global first
- Based on calibrated hydraulic flood model

Machine learning model

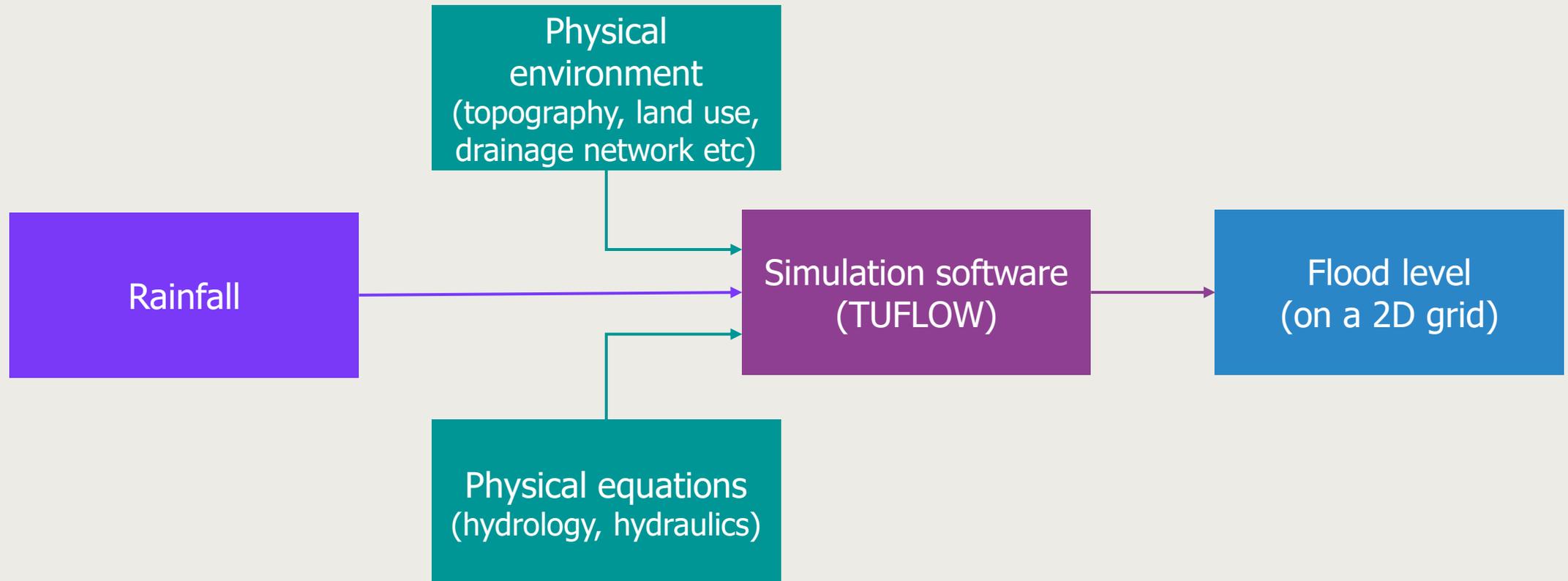


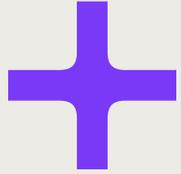
Hydraulic model



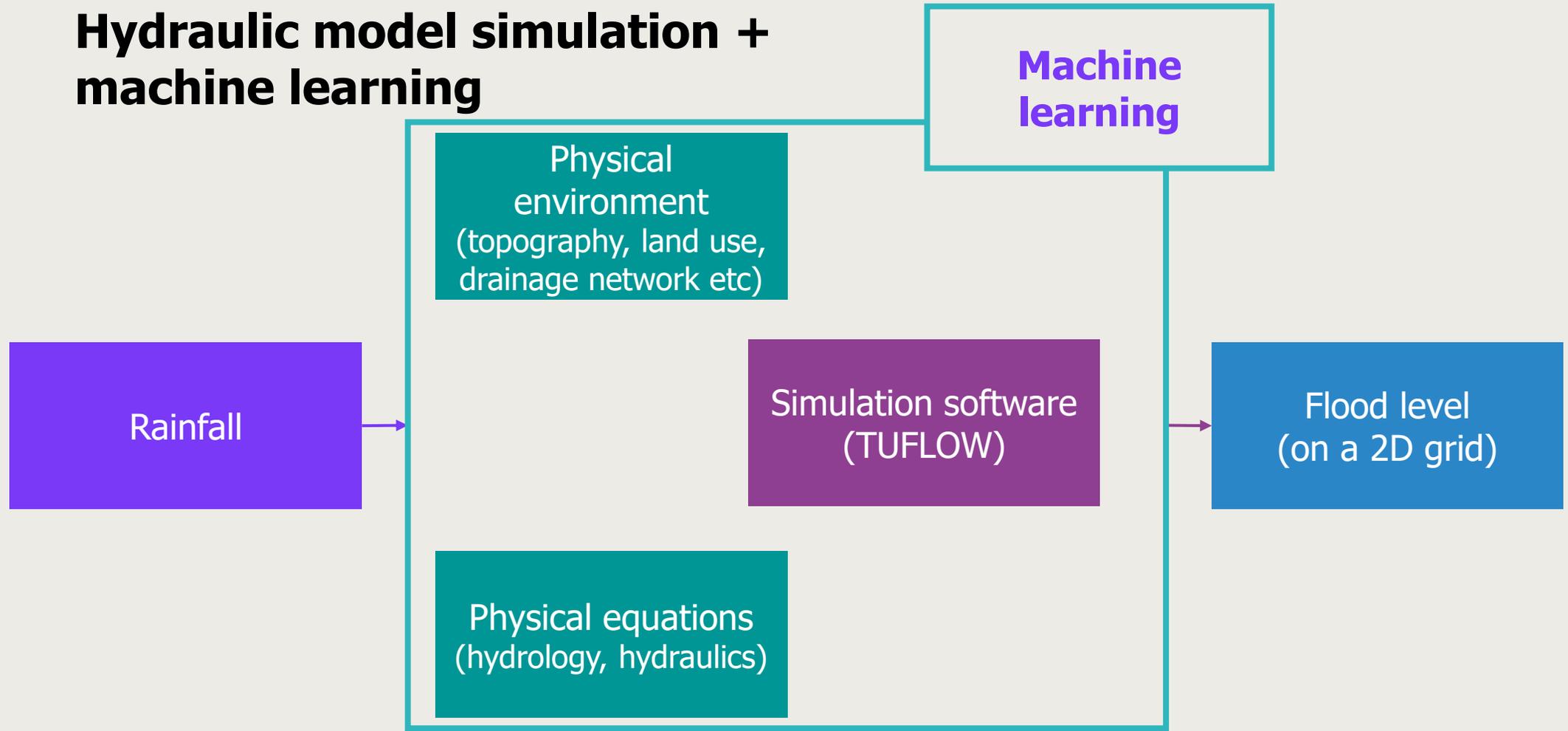


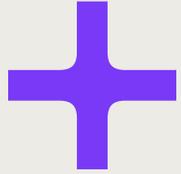
Hydraulic model simulation





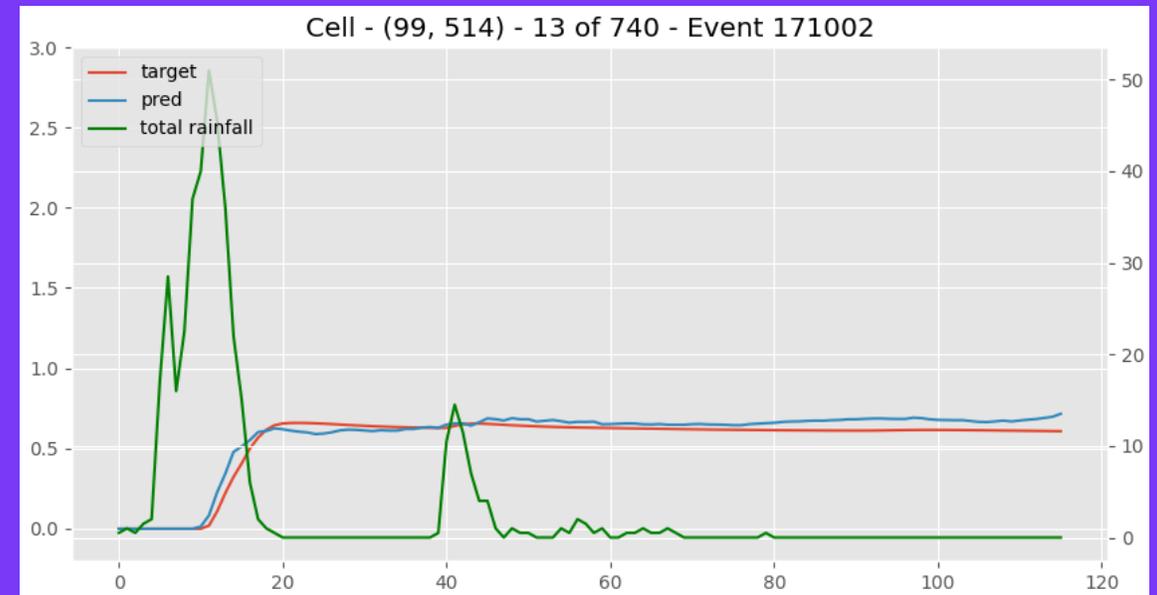
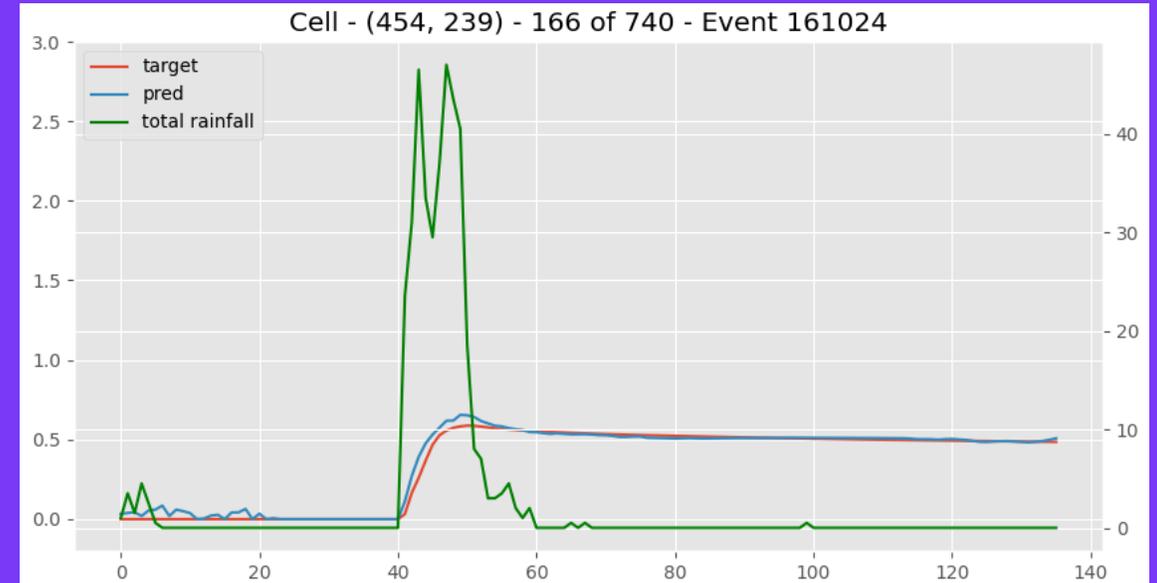
Hydraulic model simulation + machine learning

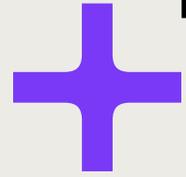




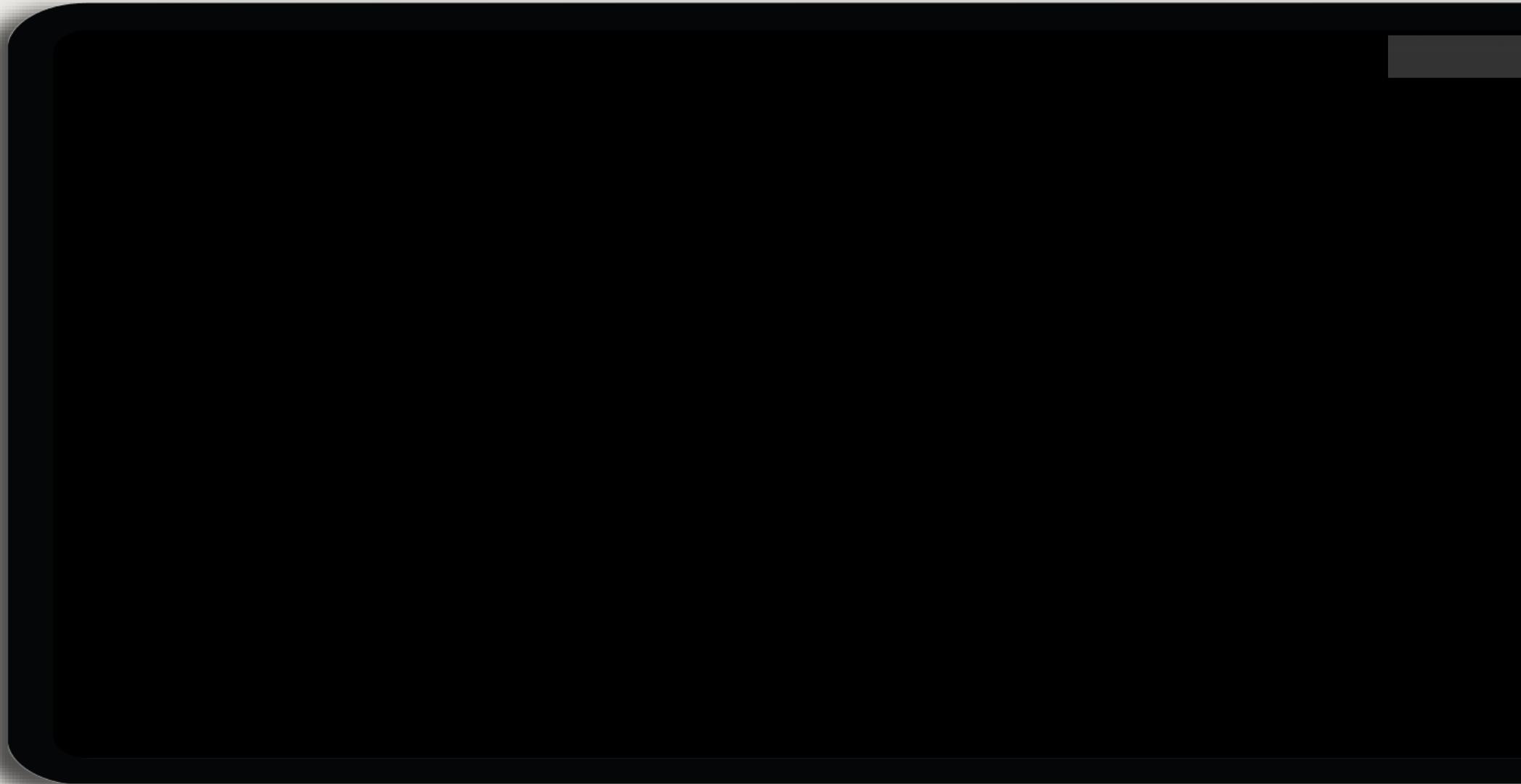
Machine learning surrogate model

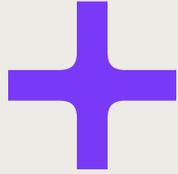
- Flood predictions in 1 second
- Relative error of 2cm
- Outputs every 10 mins





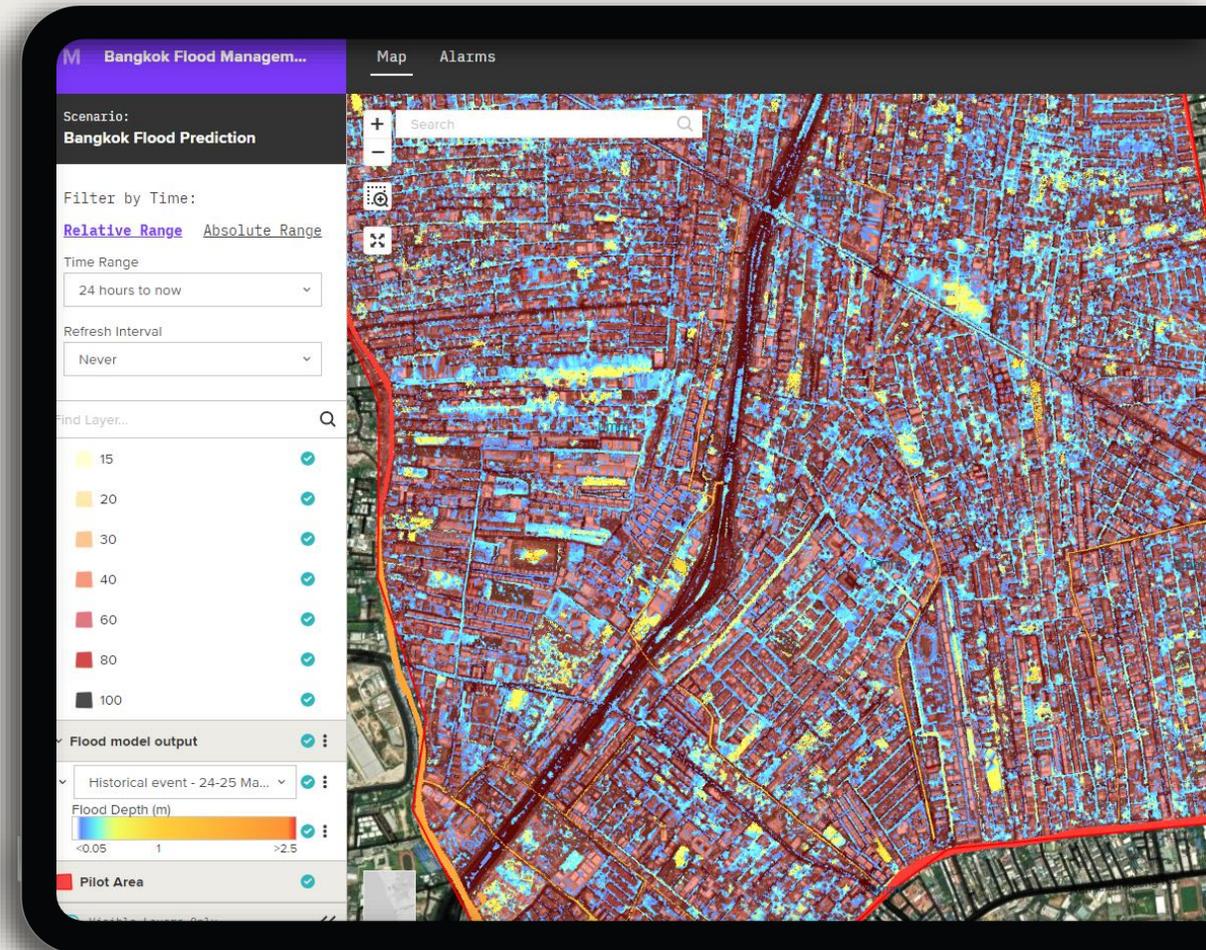
Flood forecasting in Moata interface





Flood Management Decision Support System

- Direct gauge feeds from BMA
- Secure, private web portal
- Real-time flood forecasting maps and animations
- Flood warning alarms



Key outcomes

1.

**Real-time flood
insights**

2.

**Proactive
flood response**

3.

**Opening
opportunities**



Thank you

