Urban Flood Management in Surabaya City:
Anticipating Changes in the Upstream Rivers

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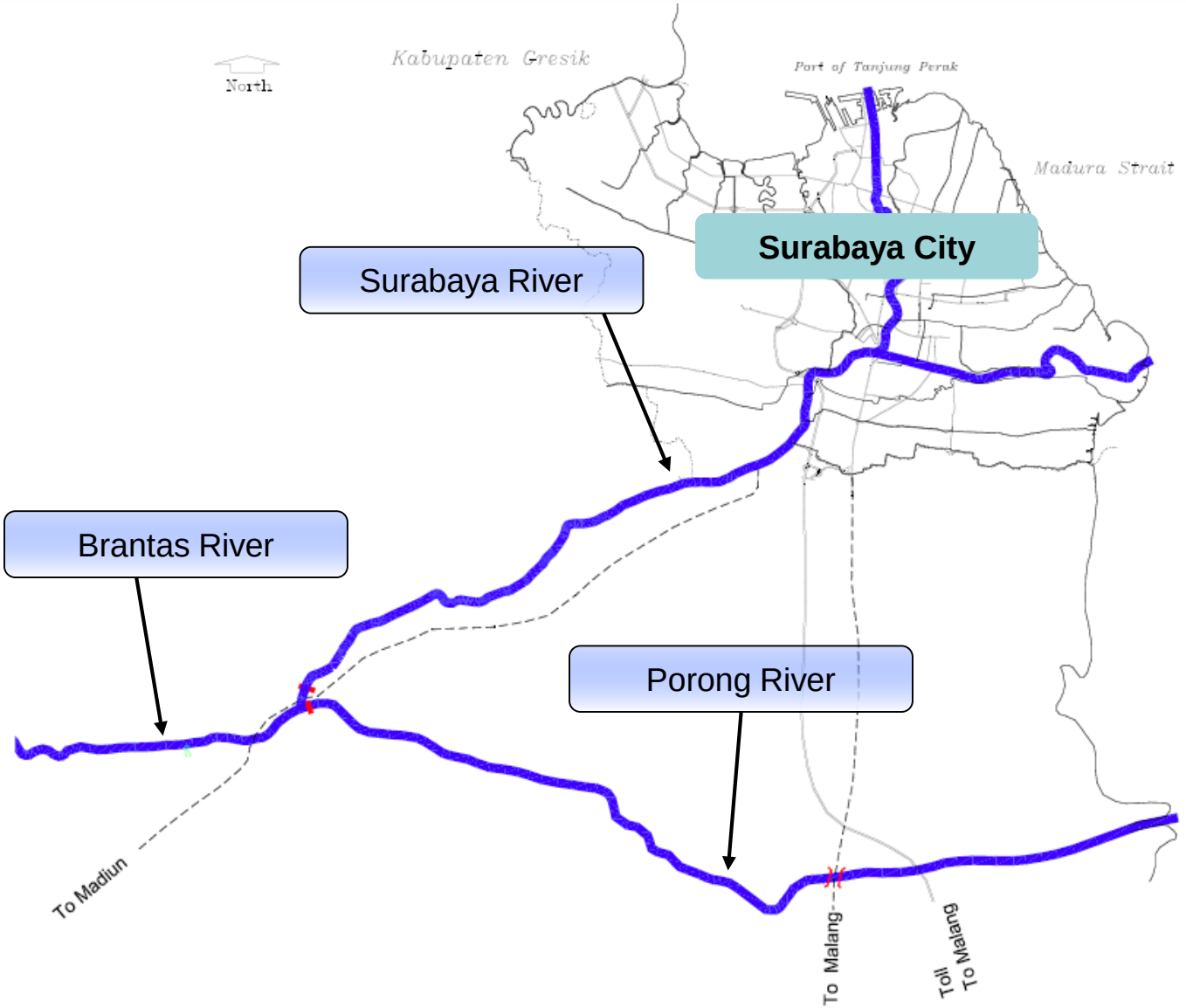
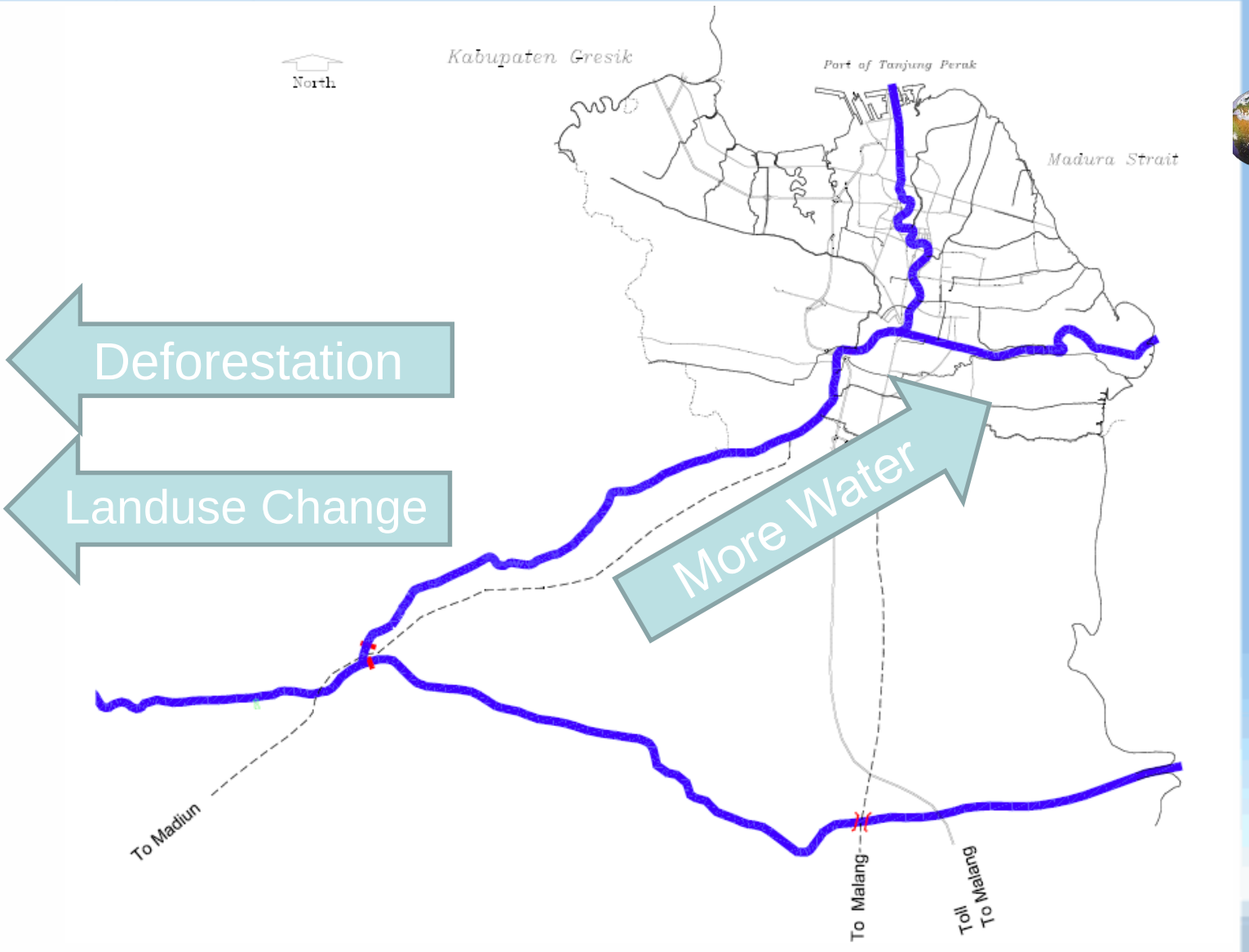
INTRODUCTION



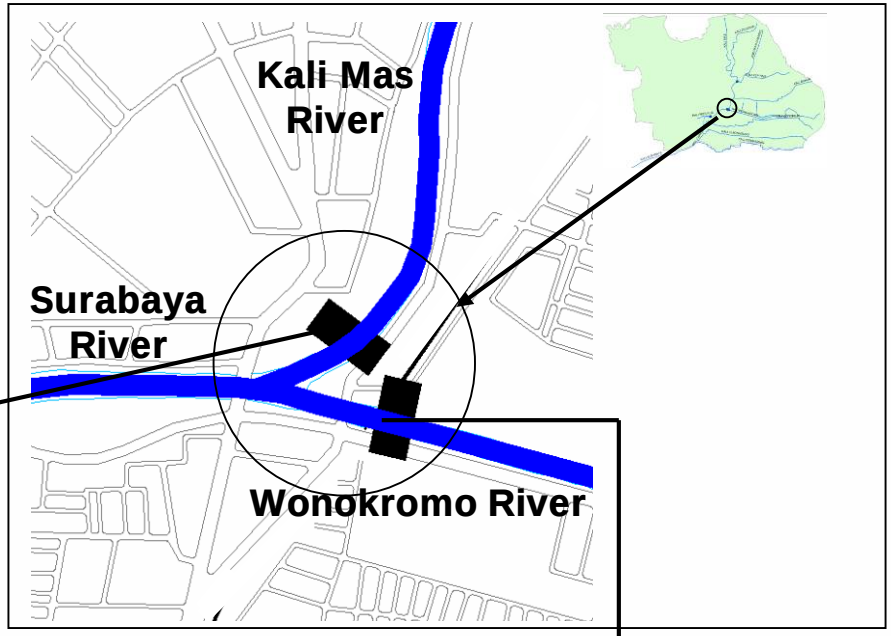
Surabaya City as a part of the Brantas River System



Surabaya City as a part of the Brantas River System

Main Regulatory Structure

Regulatory Structure Name	Adjustment During Flood
Jagir DAM	Fully Open
Wonokromo Gate	50 % Capacity



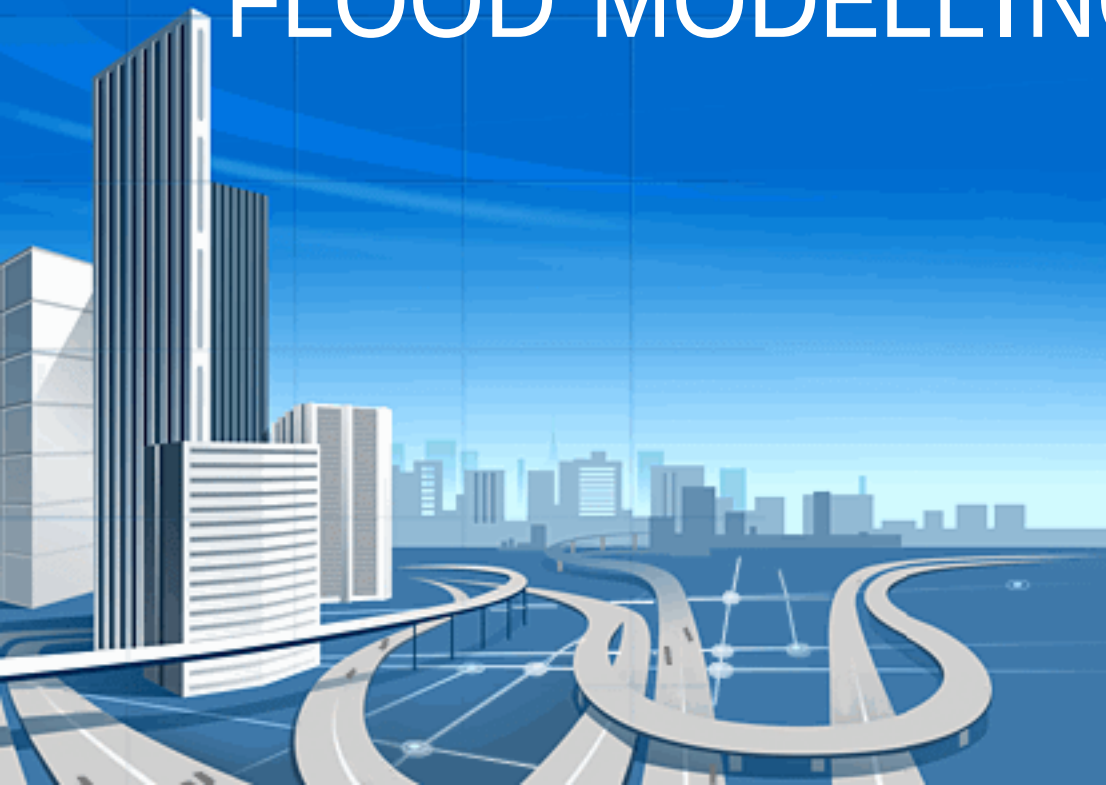
To Put on Some Perspective:

Increase of water flowing to Jakarta City already causes conflicts among stakeholders.

Research Question:

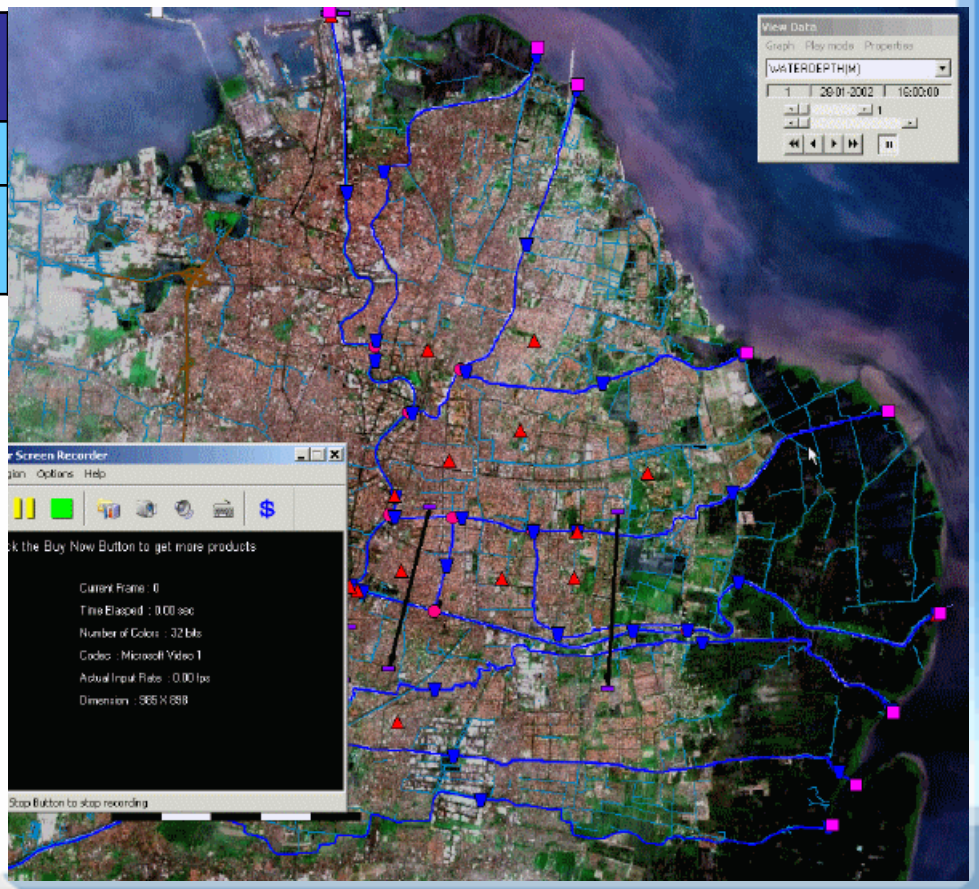
- What if the volume of water flowing into Surabaya City is increasing ?
- How can the regulatory structures be adjusted ?
- What are the impacts of those regulatory structures to flood parameters ?

FLOOD MODELLING RESULTS



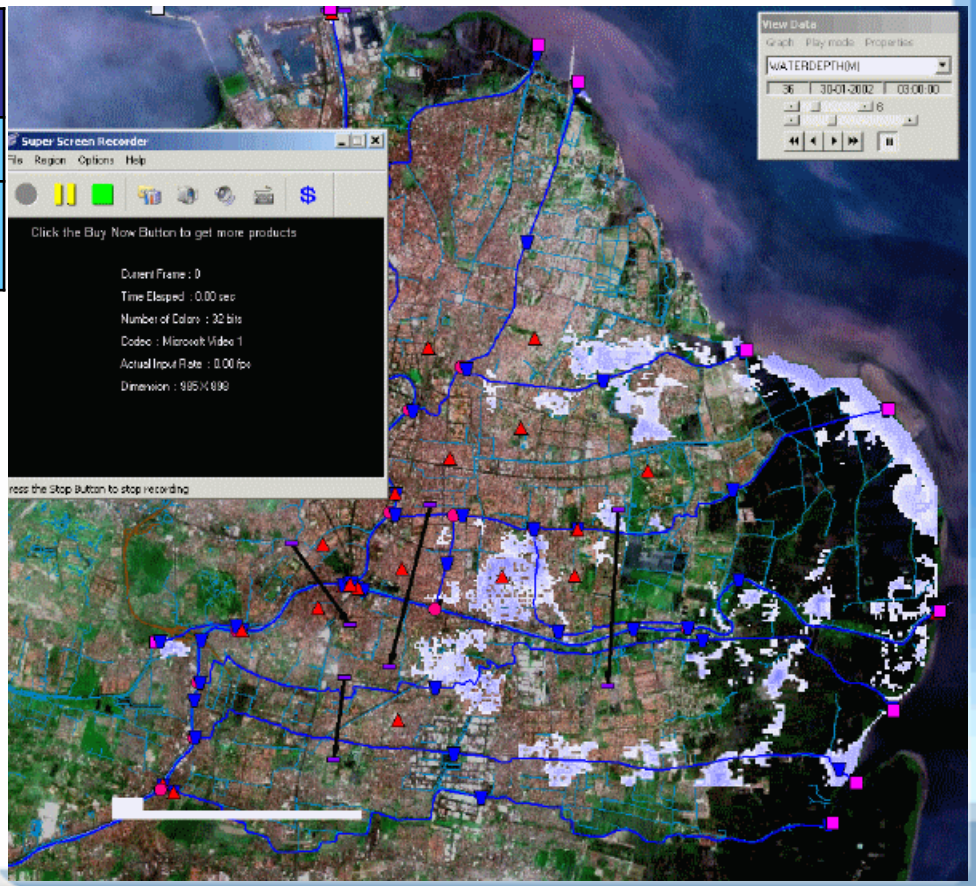
Simulated Flood Event
(3-days event, 5-years Return Period)

Regulatory Structure Name	Adjustment During Flood
Jagir Gate	Fully Open
Wonokromo Gate	50 % Capacity



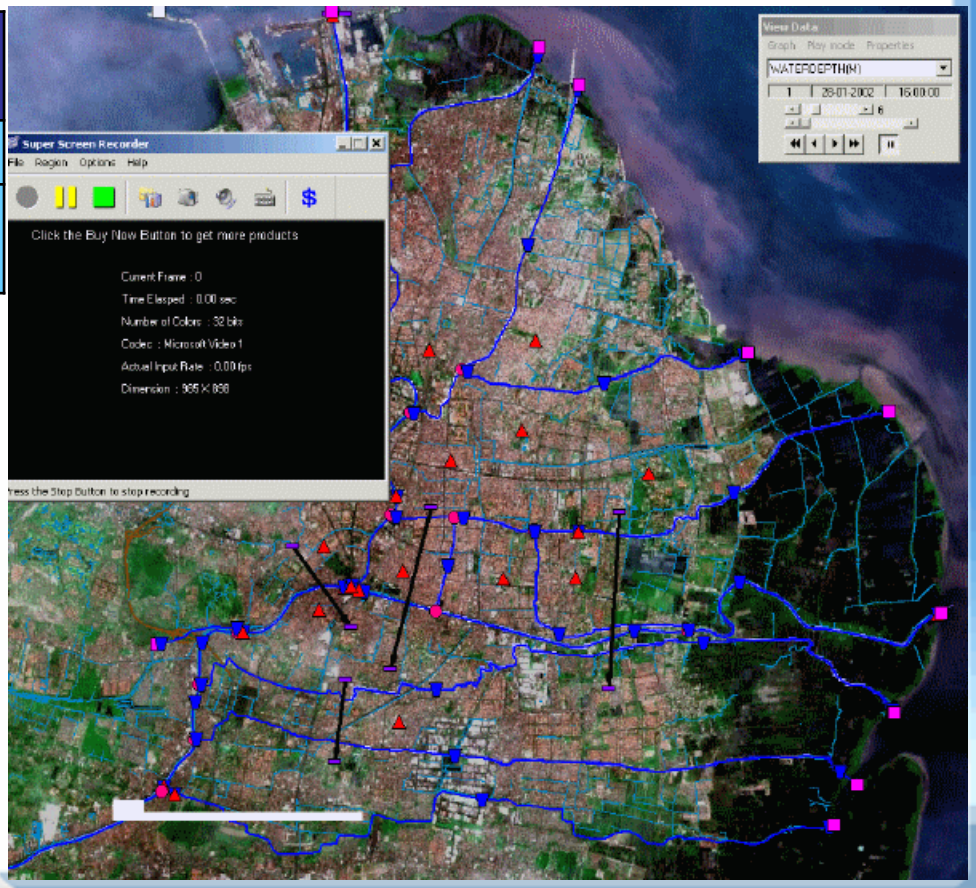
Simulated Flood Event
(5 Times of Water Flow into Surabaya City, Similar Rainfall and Sea Tide)

Regulatory Structure Name	Adjustment During Flood
Jagir Gate	Fully Open
Wonokromo Gate	50 % Capacity



Simulated Flood Event
(10 Times of Water Flow into Surabaya City, Similar Rainfall and Sea Tide)

Regulatory Structure Name	Adjustment During Flood
Jagir Gate	Fully Open
Wonokromo Gate	50 % Capacity



New Adjustment Scheme

The Eastern part of Surabaya City went on an extensive land use change, from Fish / Shrimp Ponds to Residential Areas.

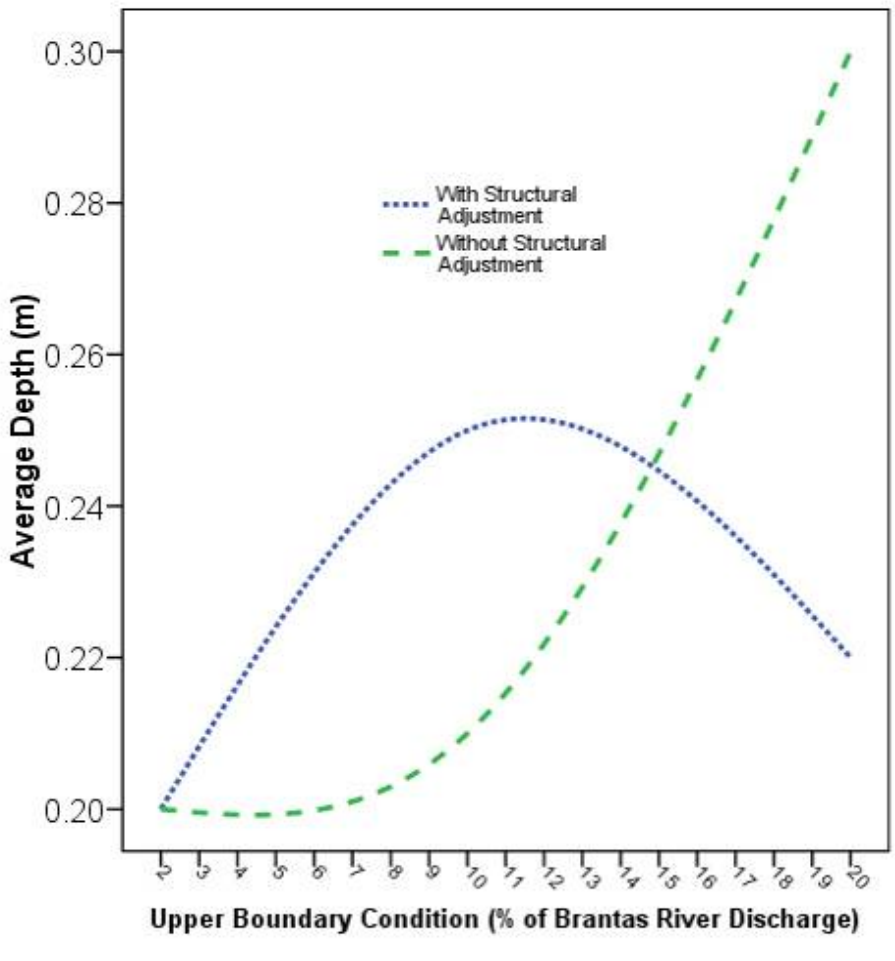
Objective of Regulatory Structures Adjustment:

Re-direct more water to the northen part of Surabaya City

Regulatory Structure Name	Current Adjustment	Proposed Adjustment
Jagir Gate	Fully Open	25 % Capacity
Wonokromo Gate	50 % Capacity	Full Capacity

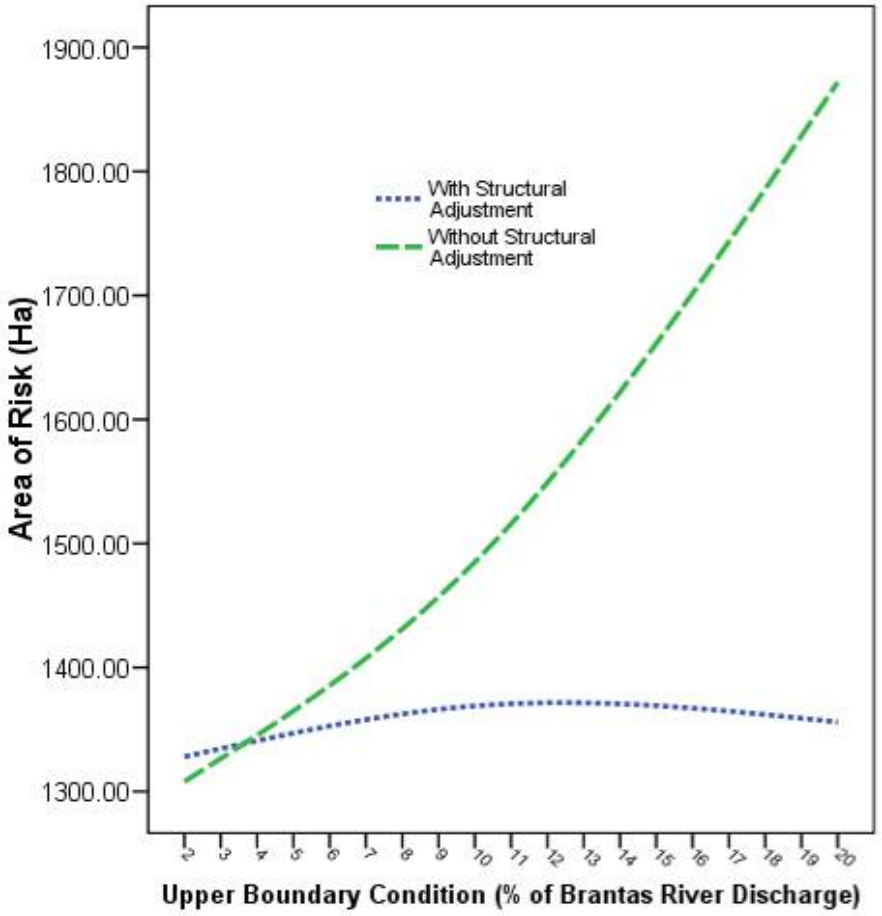
Regulatory Structures Adjustment

Result of Regulatory Structures Adjustment:



Regulatory Structures Adjustment

Result of Regulatory Structures Adjustment:



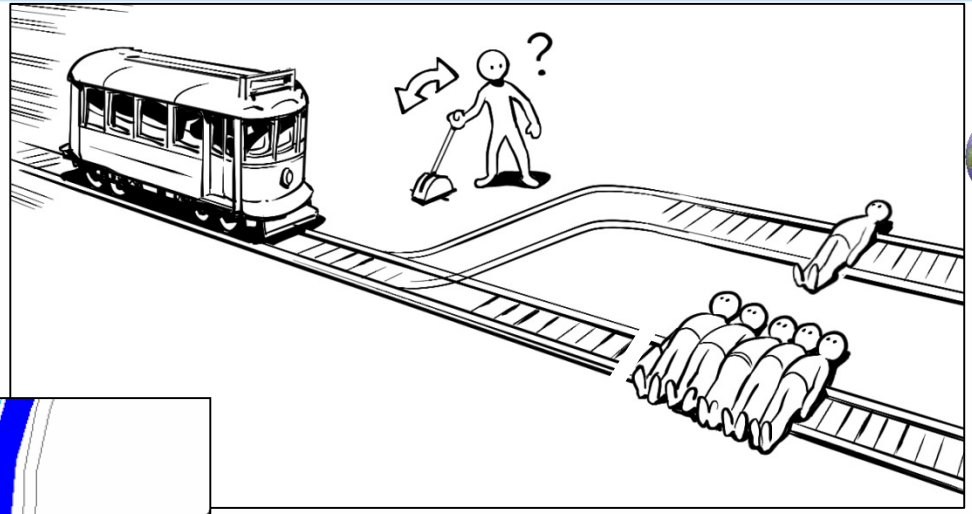
Results of the Flood Modelling:

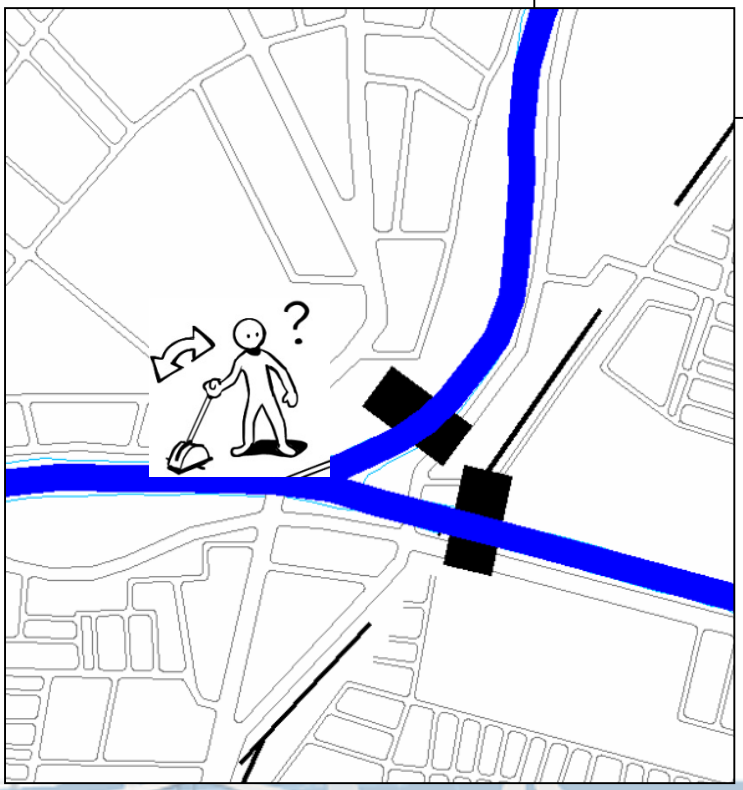
1. Surabaya City's Main Drainage System can cope with increase of flow up to 10 times of the current condition.
2. Main Regulatory Structures can be adjusted to cope with increasing flood event.
3. The New Adjustment Scheme resulted in a lower average depth until 7 times increase of water flowing to Surabaya City
4. This new scheme is constantly resulted in a wider affected areas than the currenct regulation scheme.

More Questions:

1. Which one is better: Less average depth of Flood, OR Less affected areas?
2. Who have the authority to decide what kind of flood that the Stakeholders of Surabaya City wants?
3. Should the burden to decide is given to a computer system?

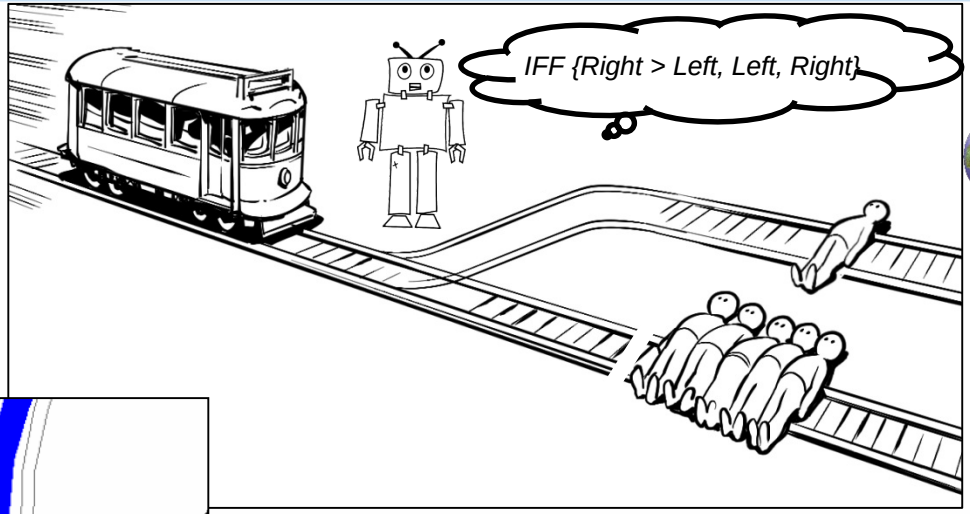
The Trolley Problem:

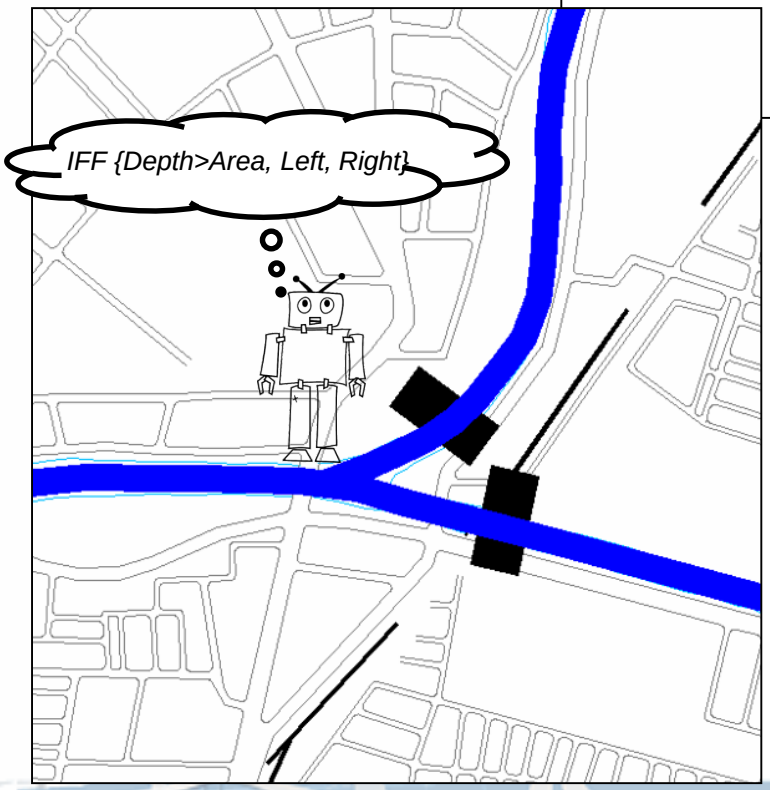




Urban Flood Decisions:

Should be solved by a computer algorithm?






Thank You