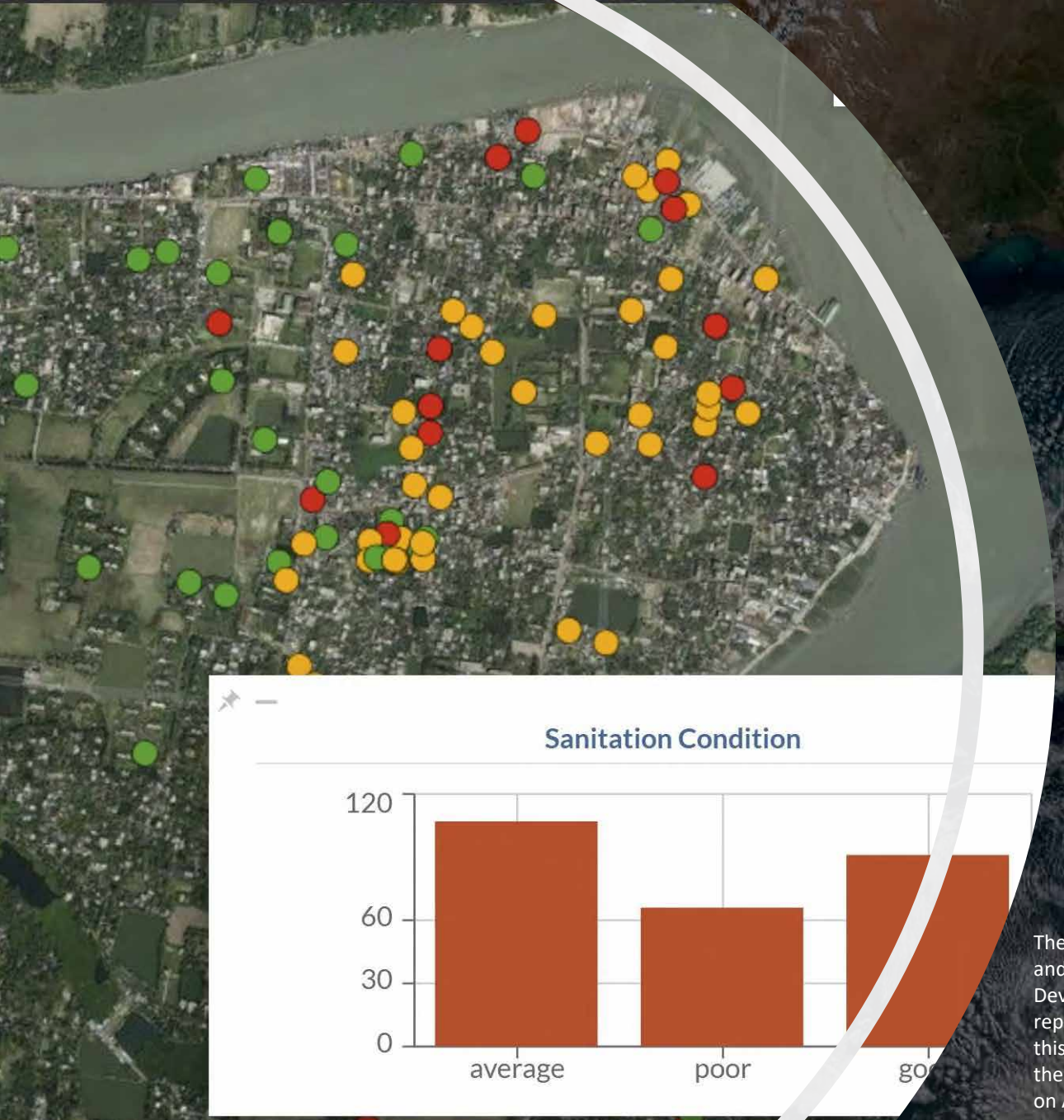
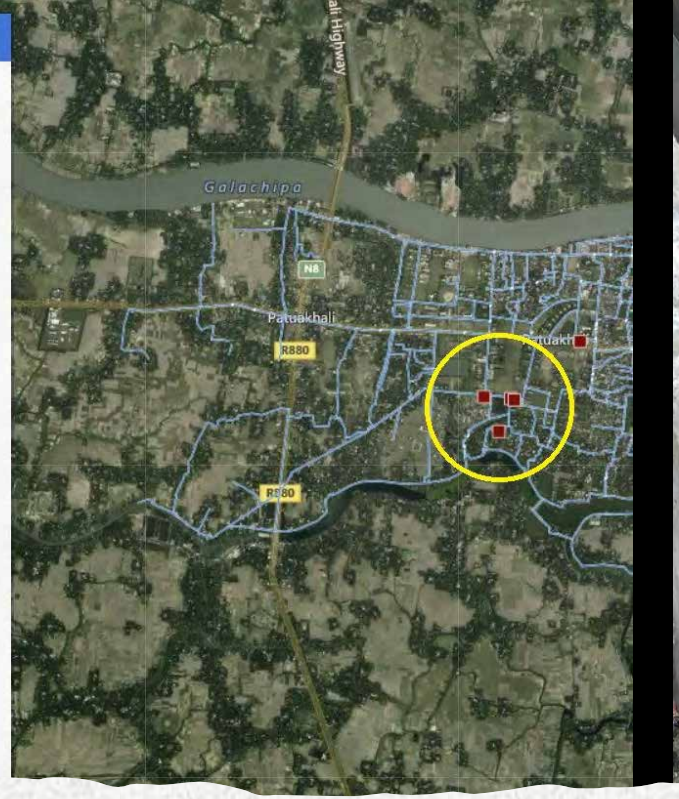
Addressing Physical (Asset) Resilience

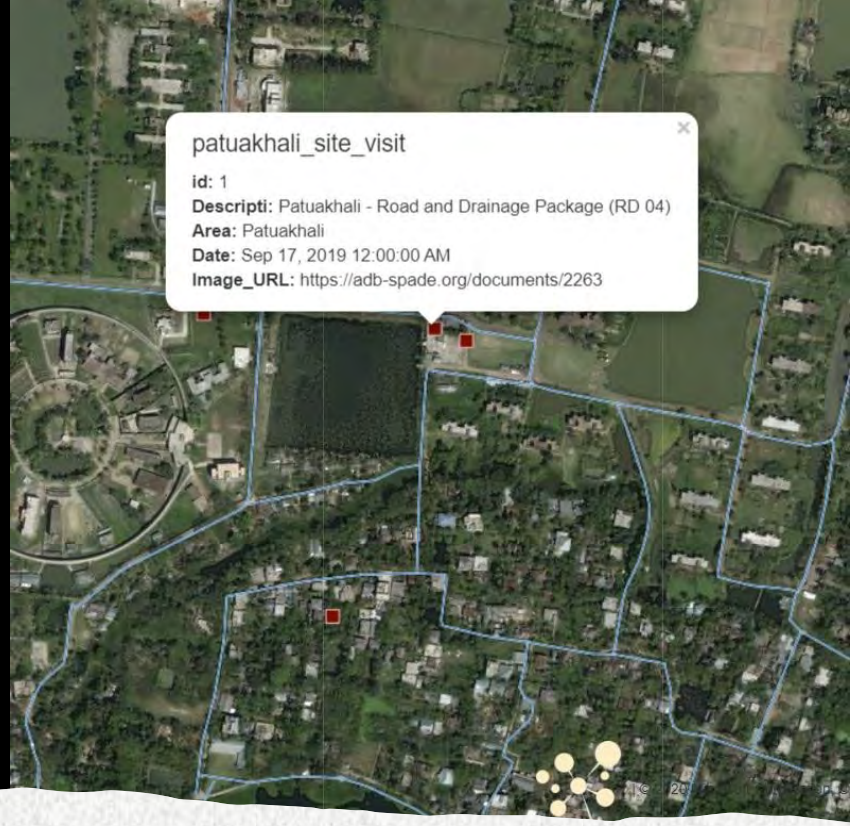
ADB Sanitation Dialogue 2021

- Sustainable Development and Climate Change Department
- Urban Sector Group
- Urban Climate Change Resilience Trust Fund
- 12 April 2021



SPADE
Spatial Data Analysis Explorer
How to build resilient, livable cities



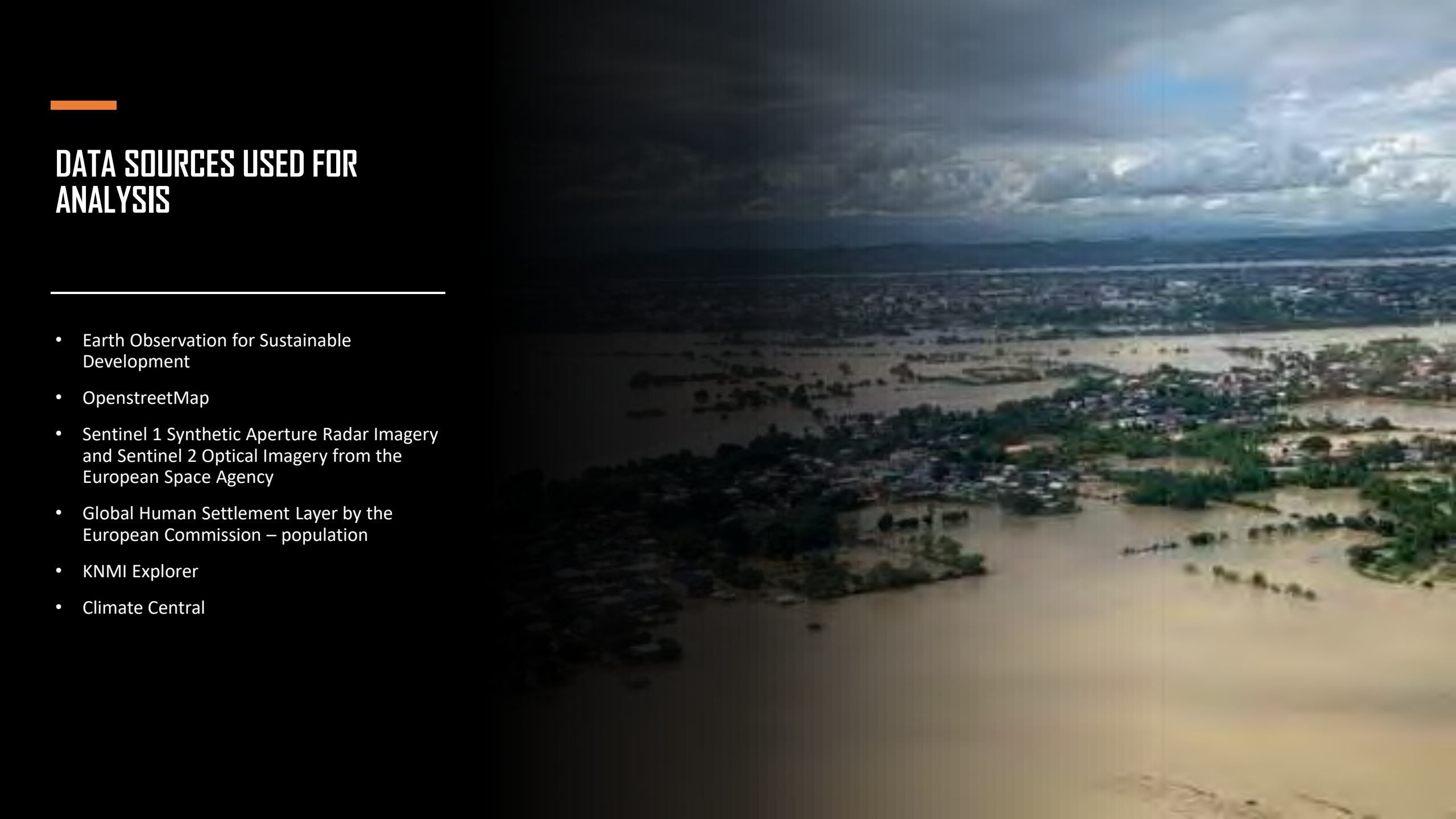


Presentation Objective

- Use of spatial data analysis for Citywide Inclusive Sanitation project design
- 2 Project examples using geospatial data and tools
  - Indonesia Citywide Inclusive Sanitation Project (Semarang)
  - Bangladesh Coastal Towns Environment Improvement Project (Patuakhali)

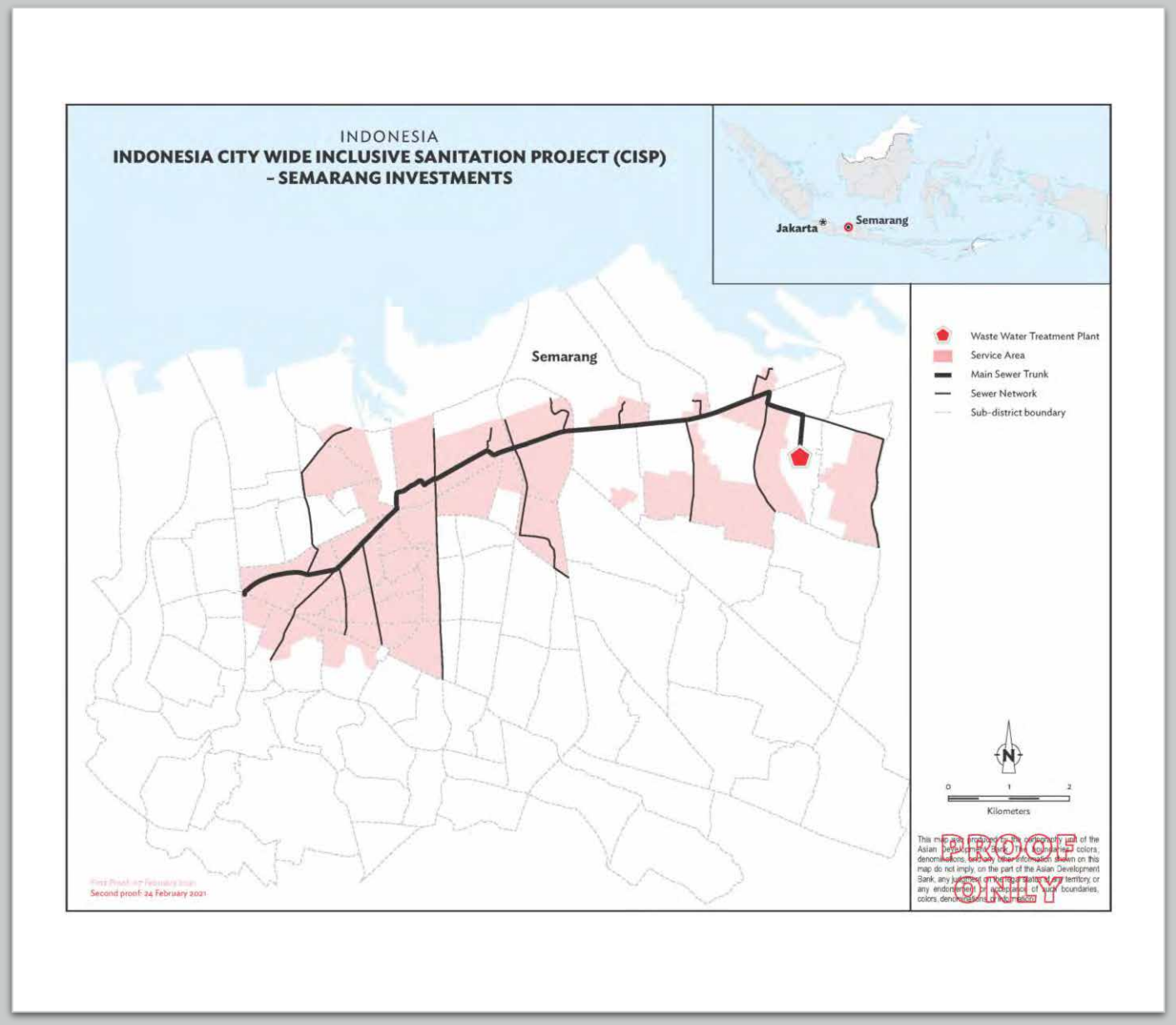
DATA SOURCES USED FOR ANALYSIS

- Earth Observation for Sustainable Development
- OpenstreetMap
- Sentinel 1 Synthetic Aperture Radar Imagery and Sentinel 2 Optical Imagery from the European Space Agency
- Global Human Settlement Layer by the European Commission – population
- KNMI Explorer
- Climate Central

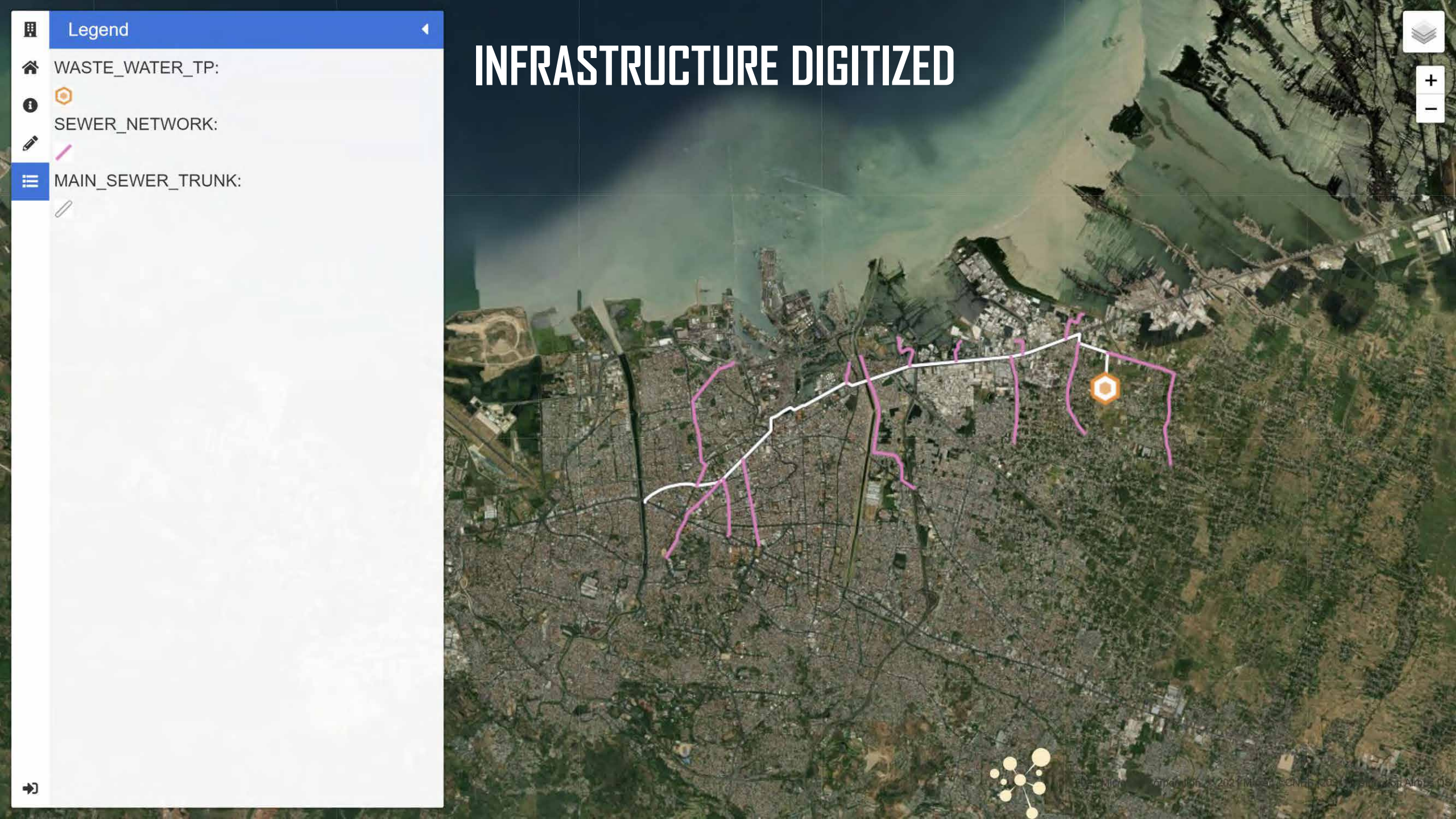


SEMARANG CITYWIDE INCLUSIVE SANITATION PROJECT

Although nearly all (91% for Semarang) individual households have septic tanks, these are often unlined, not regularly desludged and leaking and thus posing a serious health risk to the communities. The reliance on groundwater for water supply for most of the urban population exacerbates the situation.



INFRASTRUCTURE DIGITIZED



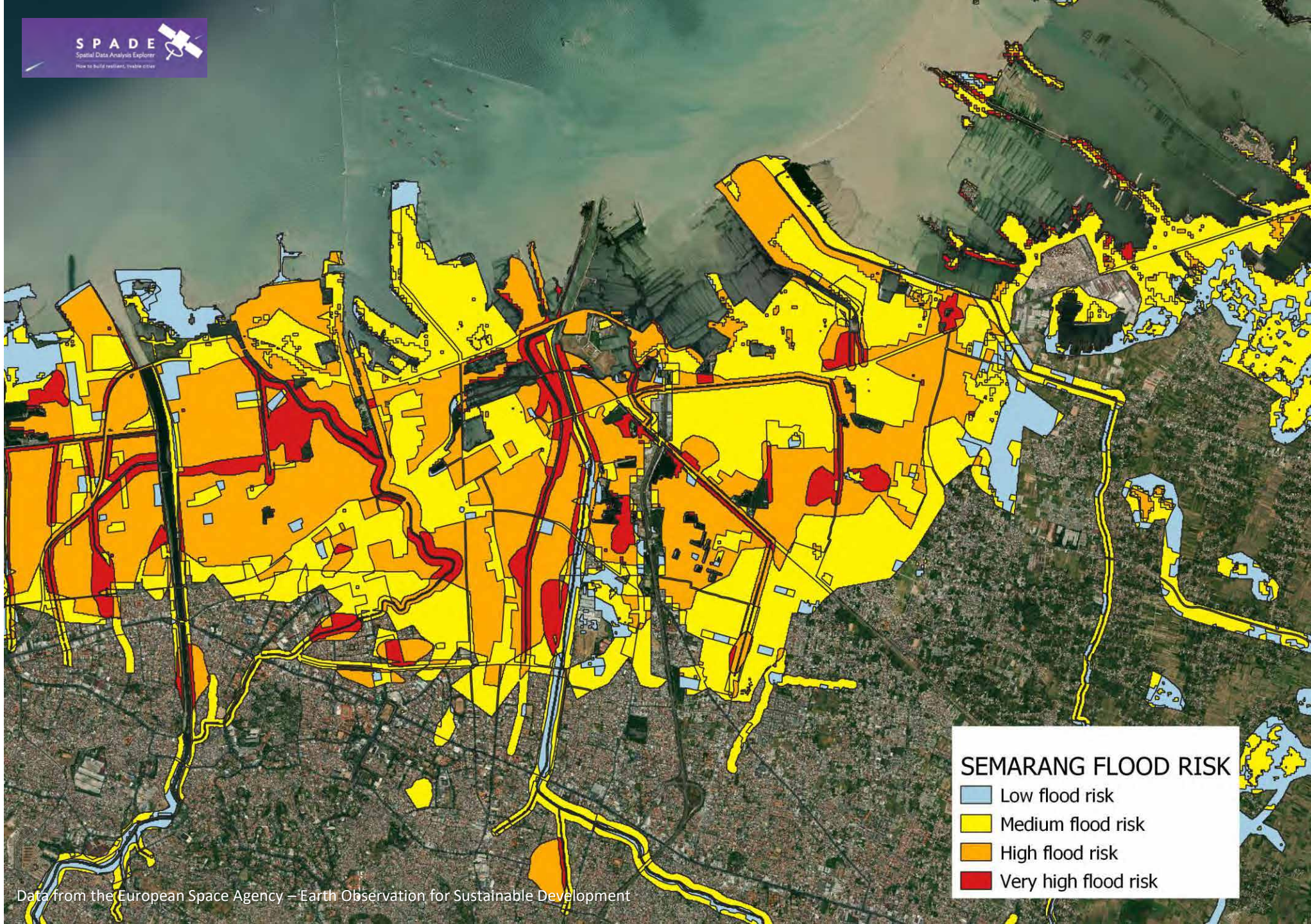
DIGITIZED BUILDING FOOTPRINT COVERED BY SERVICE AREA

- 57,359 Building Footprints

BUILDING FOOTPRINTS WERE AUTOMATICALLY EXTRACTED USING ALGORITHMS

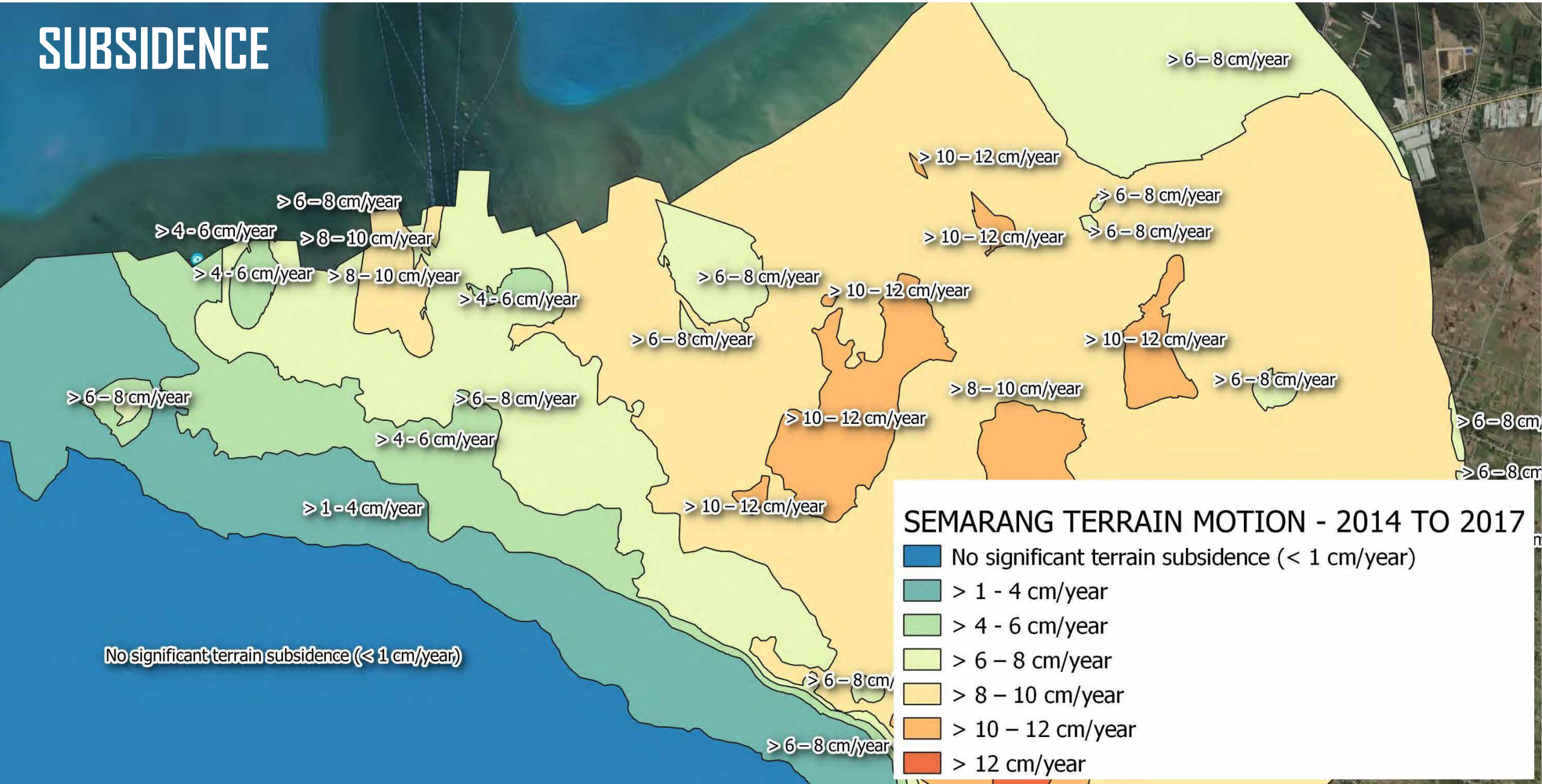
FLOOD RISK

Climate change will exacerbate existing flood risks. There is a clear signal for an increase in the intensity of precipitation, with increases in both the maximum 1-day precipitation, and maximum 5-day precipitation in the range of 20% by 2050, and potentially higher.



Data from the European Space Agency – Earth Observation for Sustainable Development

SUBSIDENCE


> 6 – 8 cm/year
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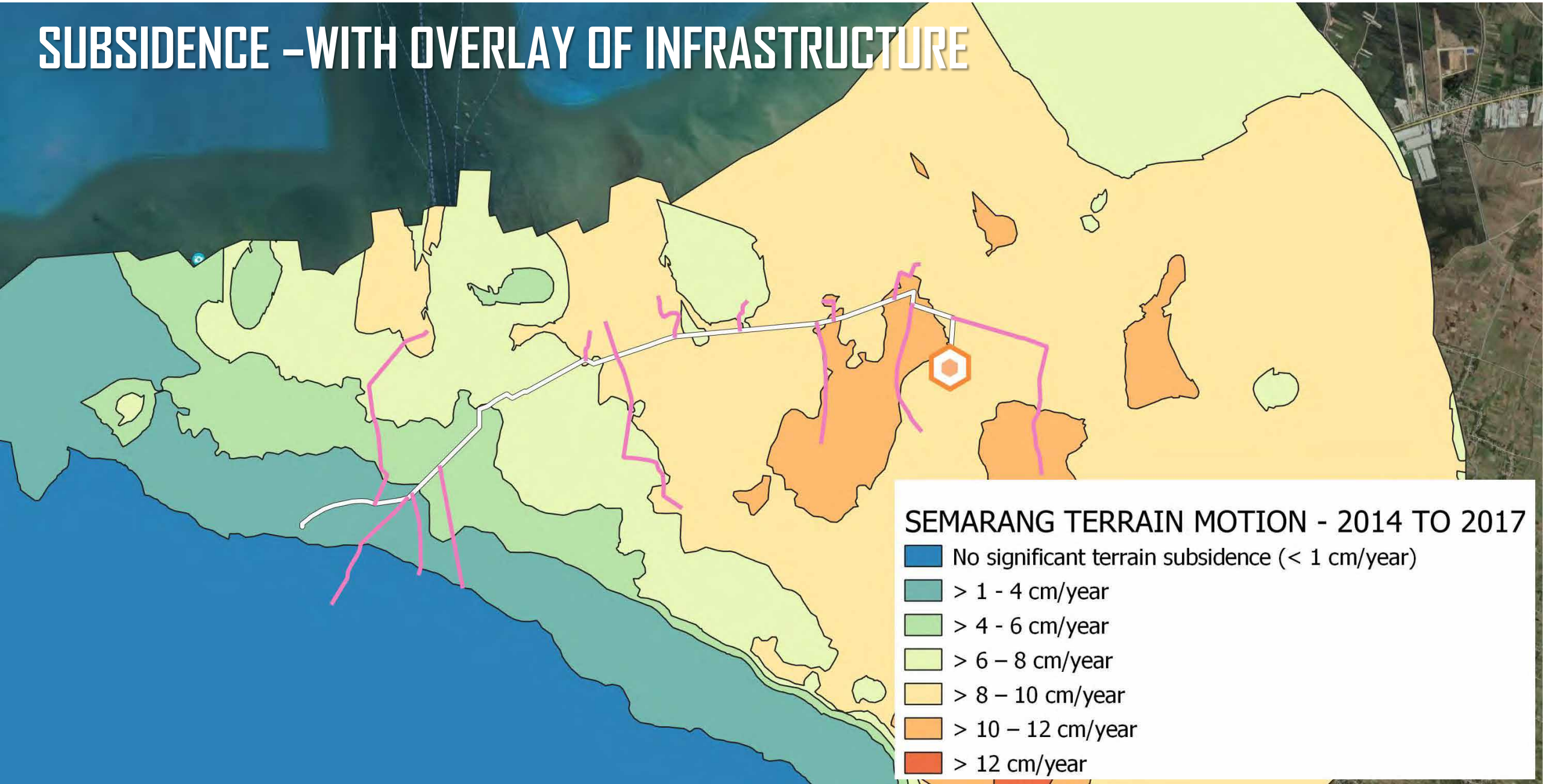
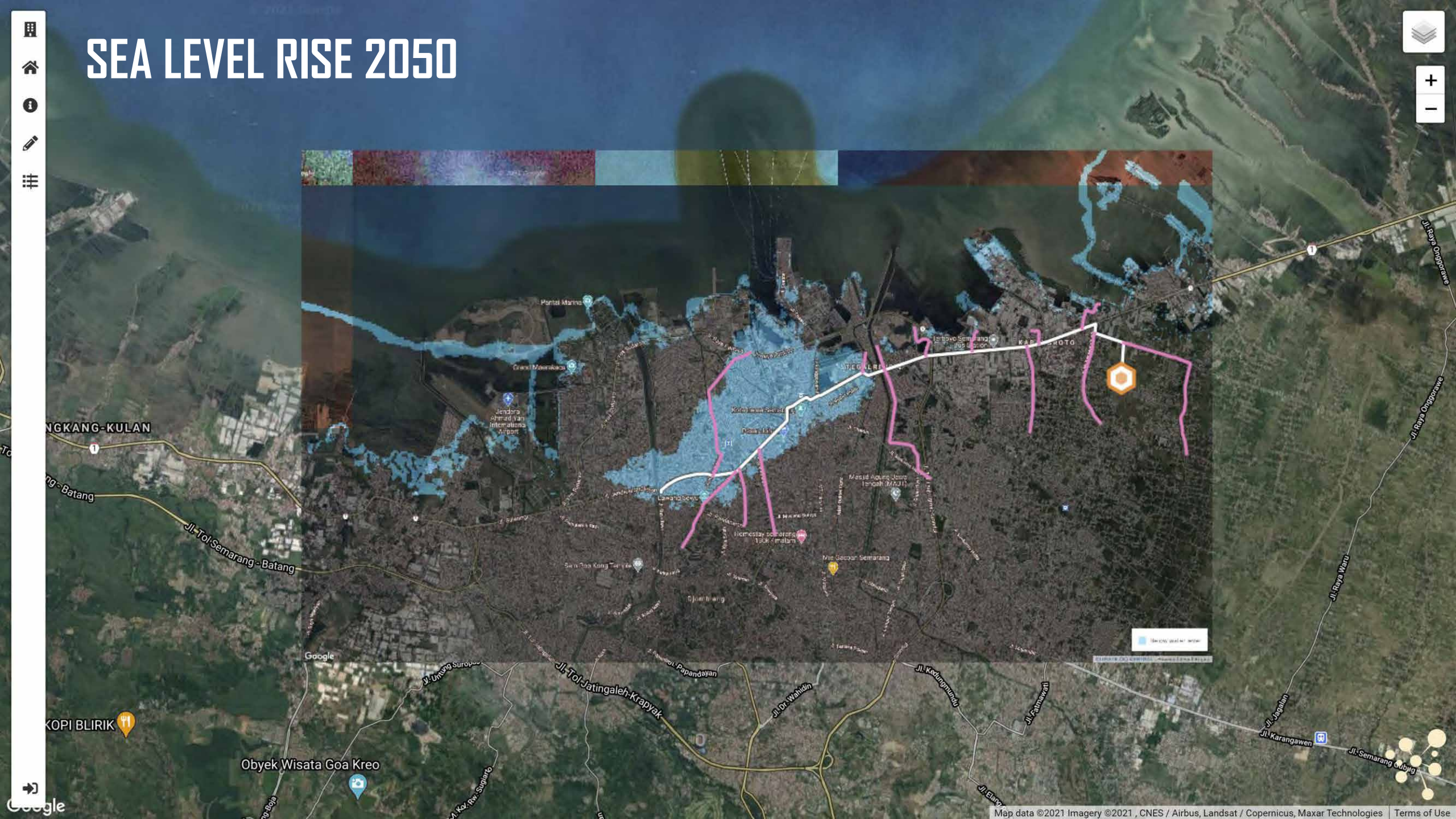
No significant terrain subsidence (< 1 cm/year)
> 6 – 8 cm/
> 6 – 8 cm/year
SEMARANG TERRAIN MOTION - 2014 TO 2017
No significant terrain subsidence (< 1 cm/year)
> 1 - 4 cm/year
> 4 - 6 cm/year
> 6 – 8 cm/year
> 8 – 10 cm/year
> 10 – 12 cm/year
> 12 cm/year

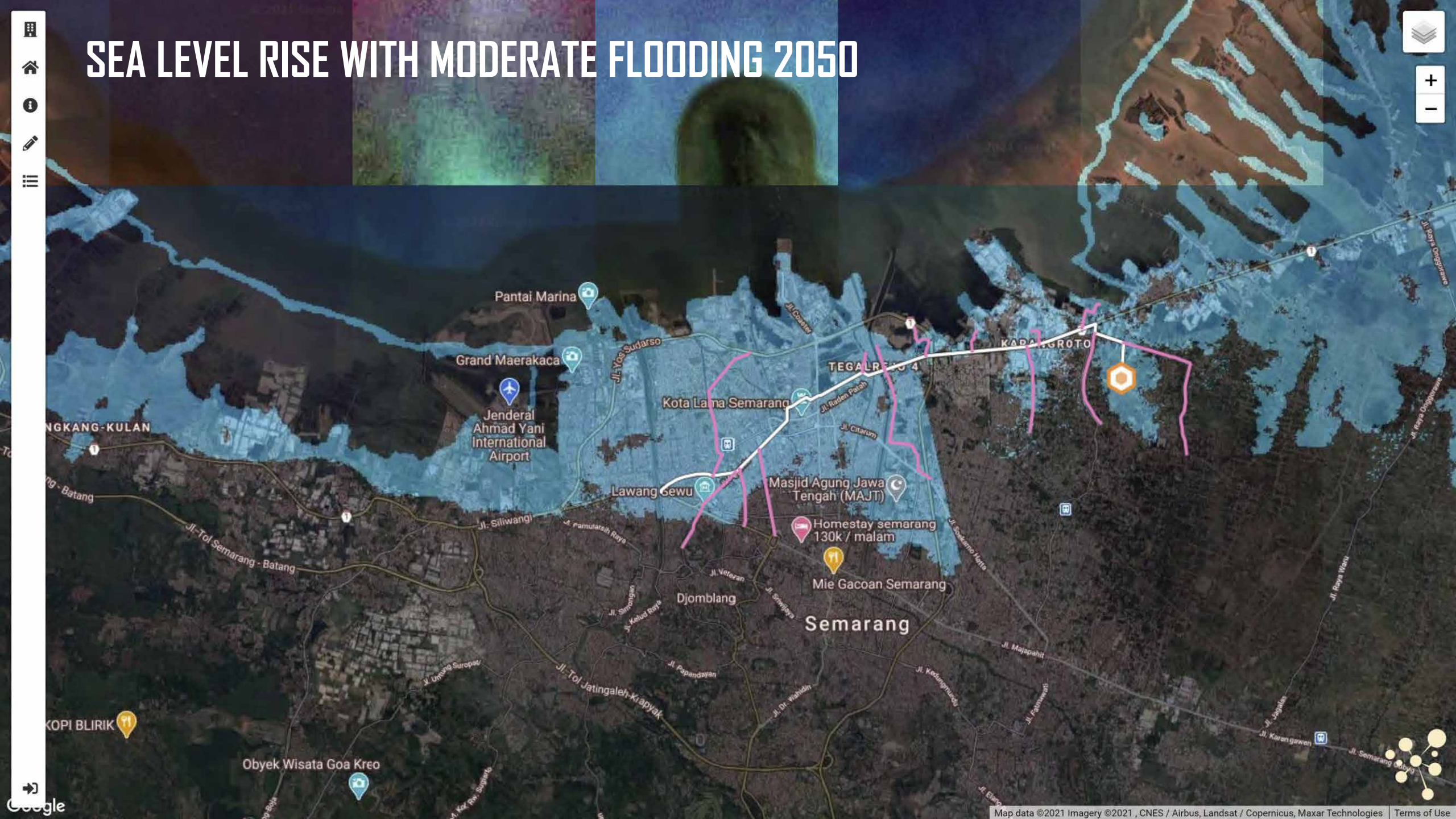
SUBSIDENCE –WITH OVERLAY OF INFRASTRUCTURE



SEA LEVEL RISE 2050

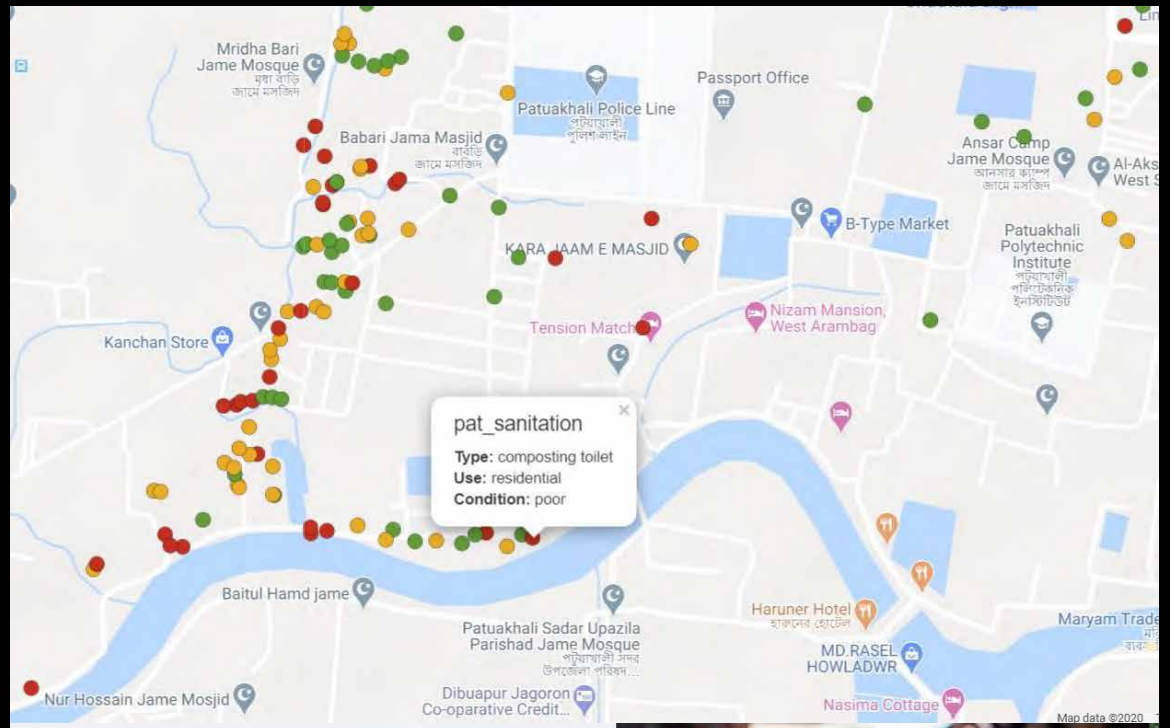


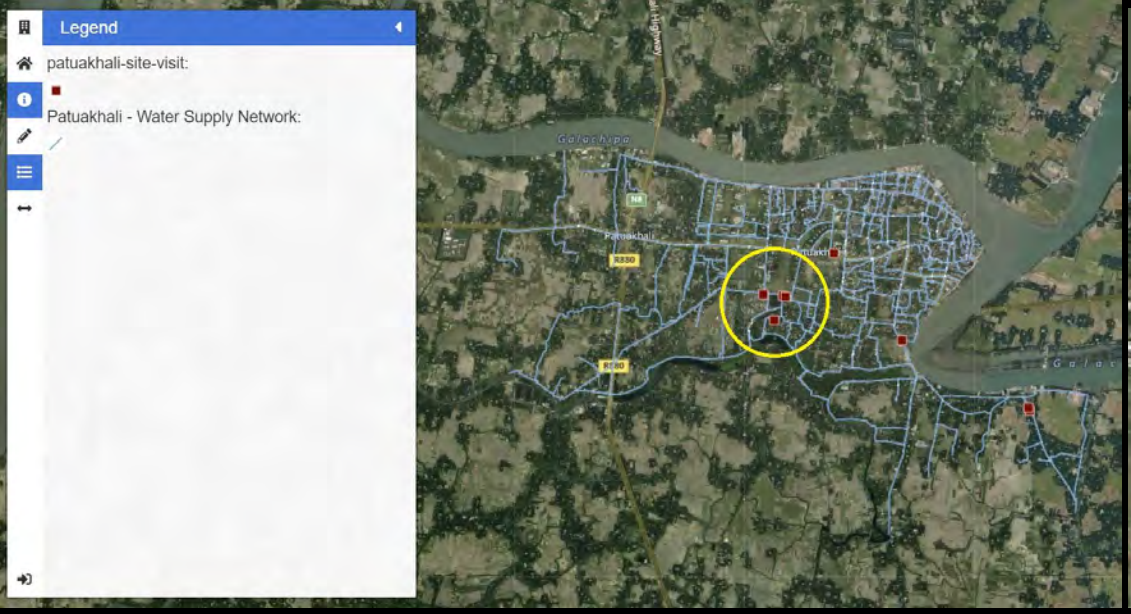
SEA LEVEL RISE WITH MODERATE FLOODING 2050

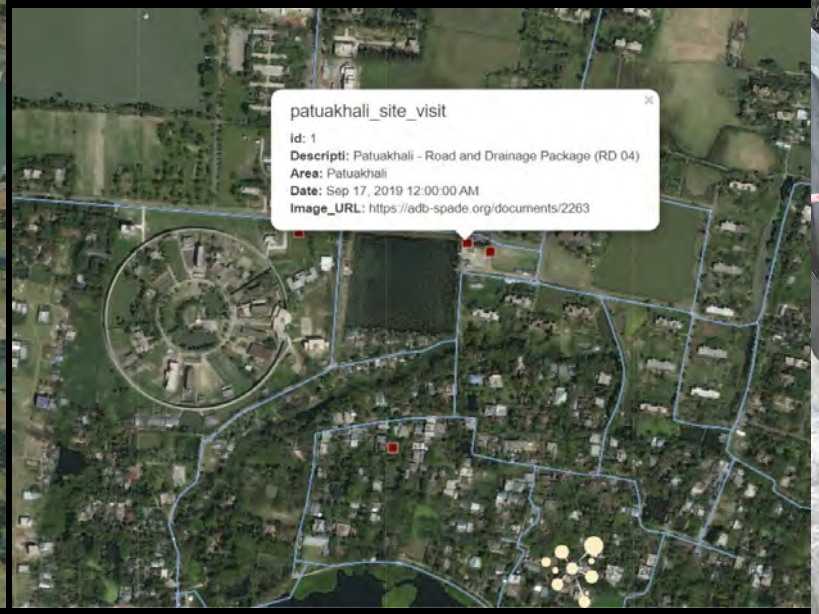


PATUAKHALI CWIS

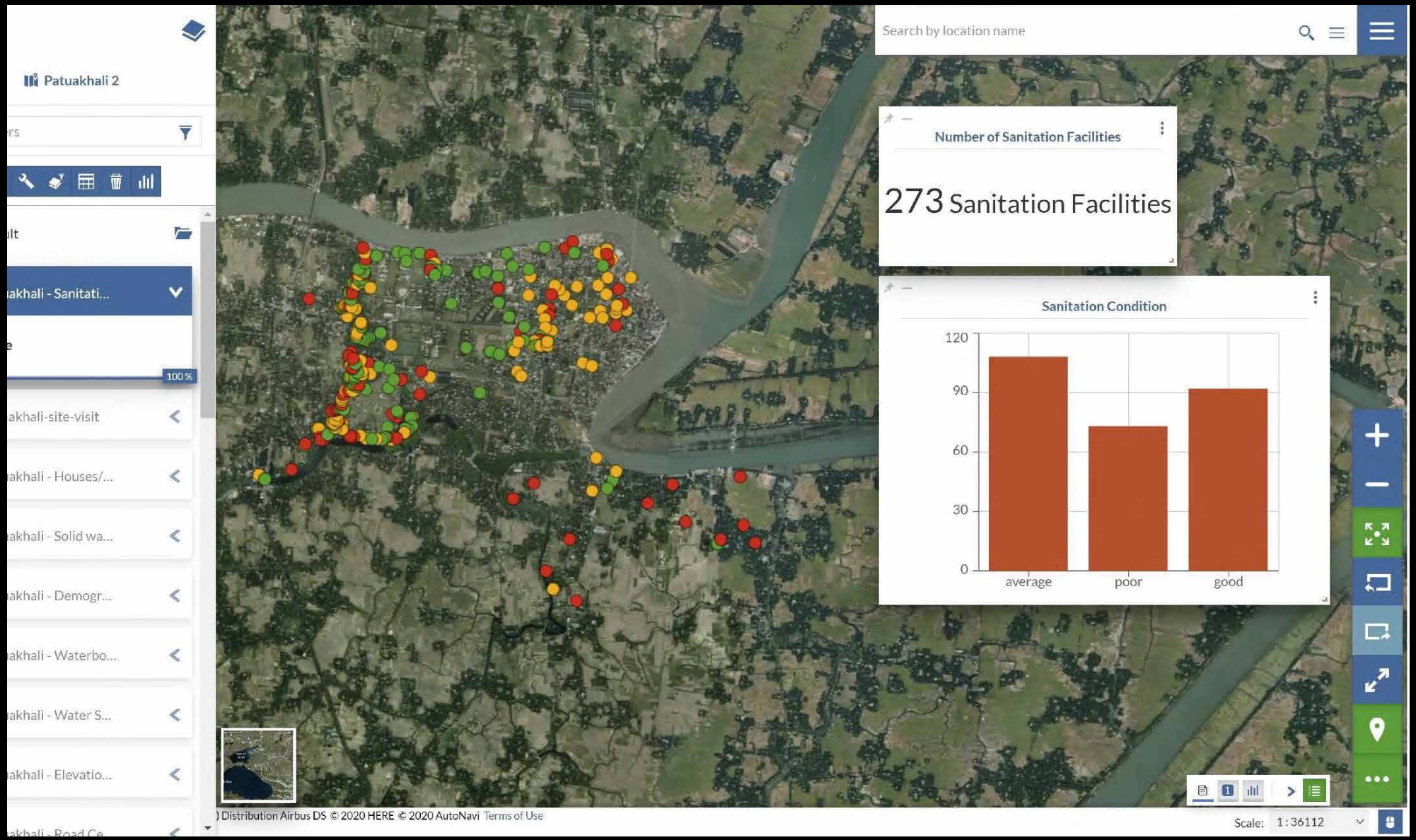
- Mapping of UCCRTF supported infrastructure
- Use of SPADE in relation to Citywide Inclusive Sanitation (CWIS) approach
- Infrastructure Plans and household surveys were digitized







Map shows water supply network, with image (right) of a section of street drains (RD-04). Concrete cover is twice the standard to compensate for higher salinity



Mapping of City-wide Sanitation facilities in Patuakhali, with GIS unit in BAN.

DMC users and **POs use for safeguard assessment – affected people, areas and structures**- non-connected poor HHs (FSM) for targeted sanitation interventions.

FLOODING IN PATUAKHALI

- Using algorithms (Artificial Intelligence and Machine Learning), Sentinel 1 data were analyzed pre and post Cyclone Amphan to have the estimated flooded areas within Patuakhali, Bangladesh

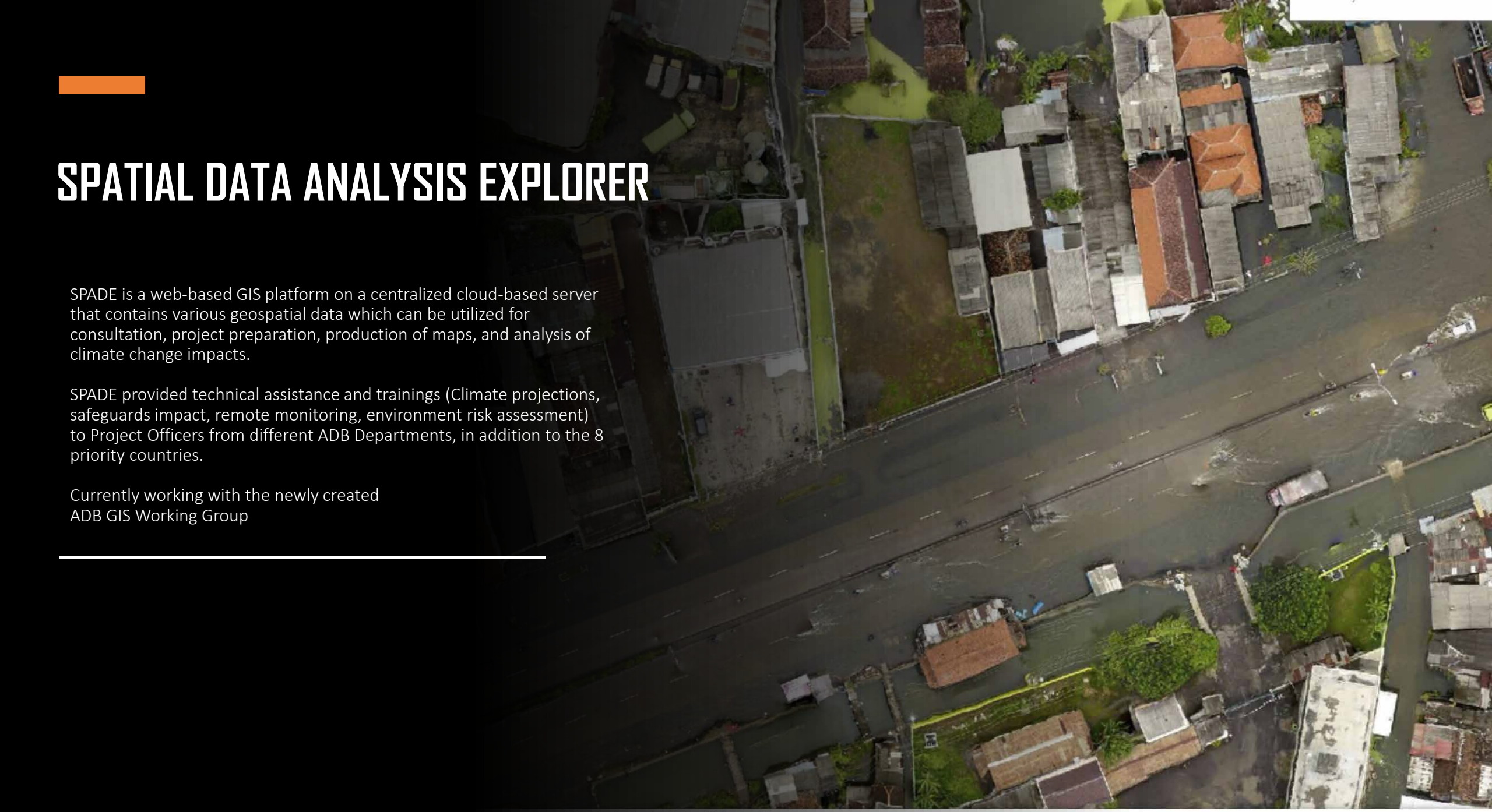
LOCATIONS IN PATUAKHALI, BANGLADESH SHOWING POTENTIALLY FLOODED AREAS

SPATIAL DATA ANALYSIS EXPLORER

SPADE is a web-based GIS platform on a centralized cloud-based server that contains various geospatial data which can be utilized for consultation, project preparation, production of maps, and analysis of climate change impacts.

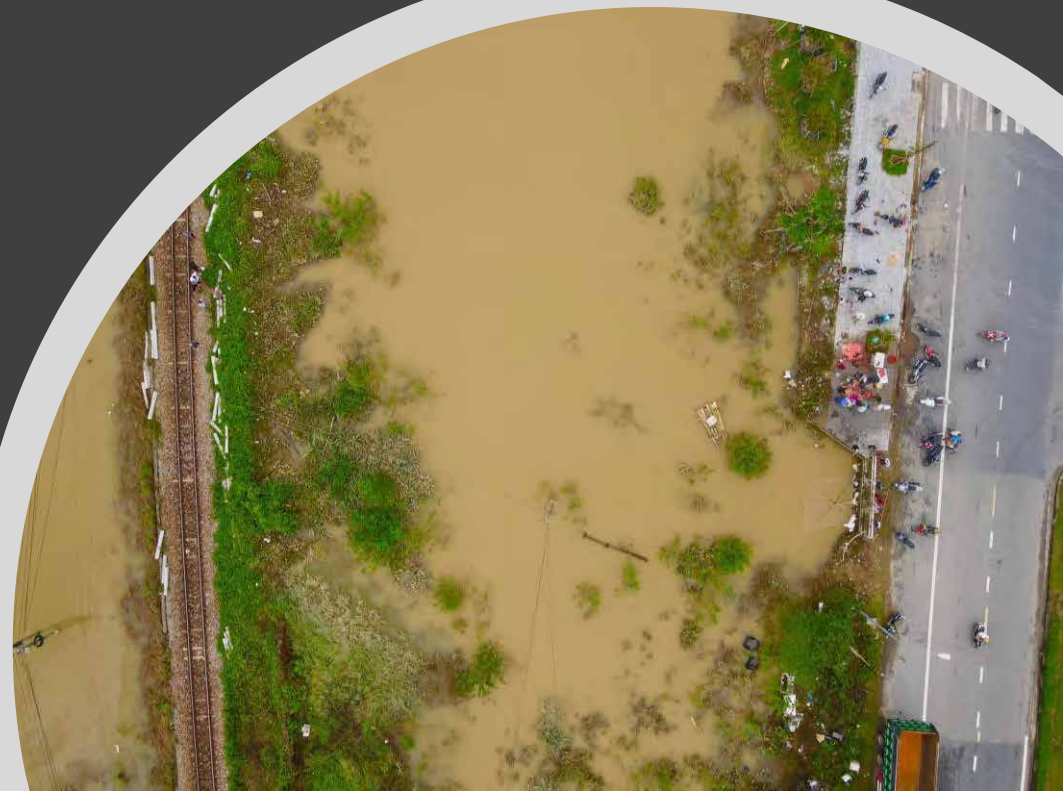
SPADE provided technical assistance and trainings (Climate projections, safeguards impact, remote monitoring, environment risk assessment) to Project Officers from different ADB Departments, in addition to the 8 priority countries.

Currently working with the newly created
ADB GIS Working Group



SUMMARY

- Use of Climate Risk data for sanitation infrastructure planning
- Utilization of open-source data to produce critical analysis
- SPADE as the tool to integrate all the datasets and analysis



THANK YOU

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