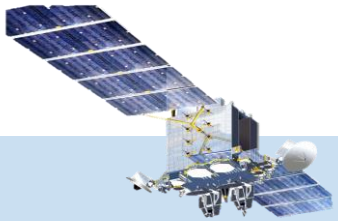
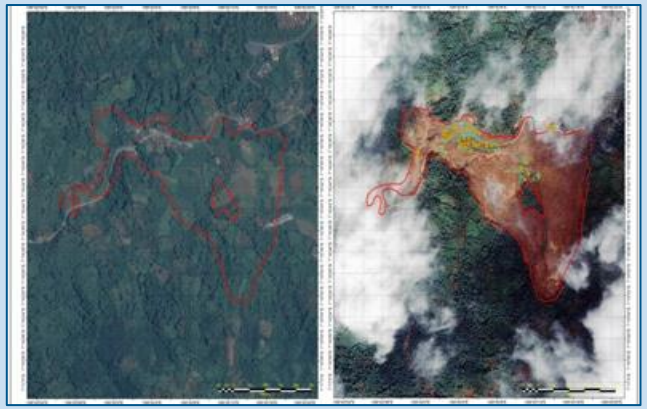
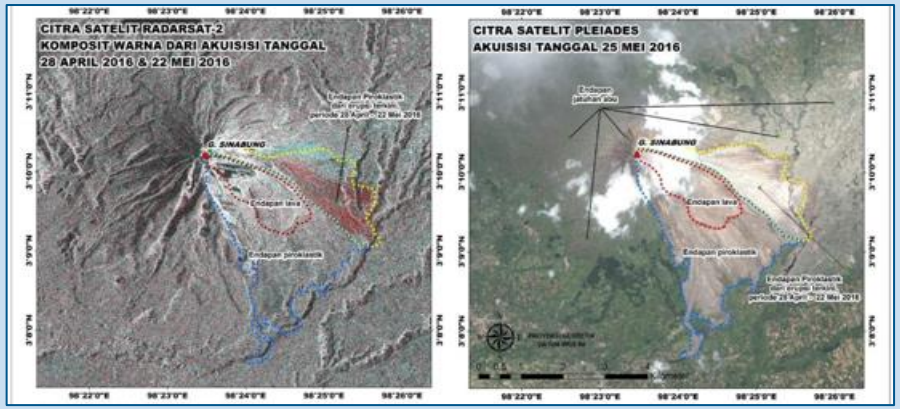
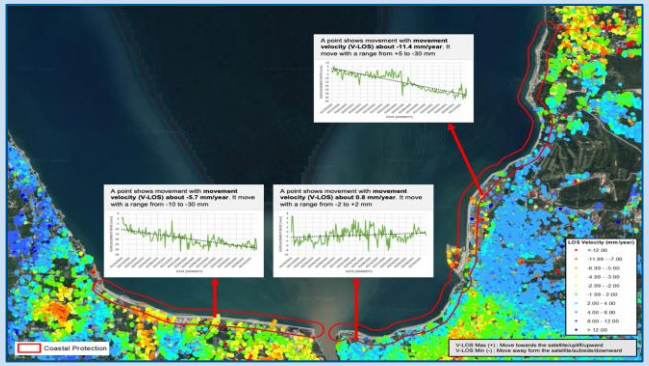


Satellite Earth Observation Services Support for NATIONAL DATA PORTAL in Indonesia)



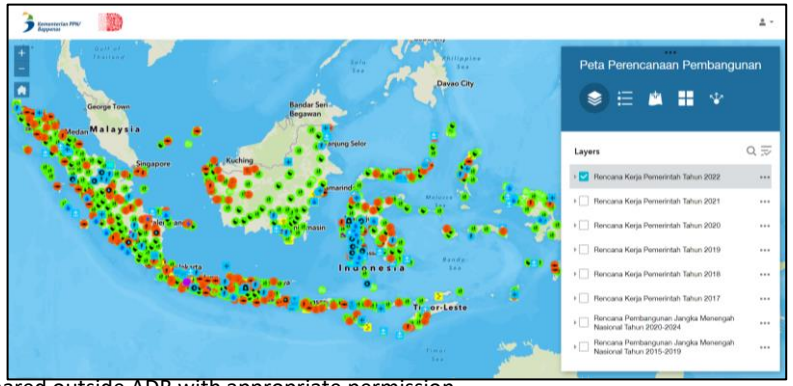




PRESIDENTIAL REGULATION NUMBER 39 OF 2019 FOR ONE INDONESIAN DATA SIGNED ON 12 JUNE 2019.

SATU DATA INDONESIA or One Indonesia Data is a government data management policy to generate the reliable and accurate data, up to date, integrated, easily accessible, and can be shared and used by the stakeholders.

PORTAL SATU DATA INDONESIA is an Indonesia's official open data portal which developed to improve data governance management to support the implementation of government transparency and accountability, as well as support national development.



Access to portal satu data:
https://satudata.go.id/home

Secretariat of One Data Indonesia

Kementerian PPN/ Bappenas

Ministry of National Development Planning/BAPPENAS

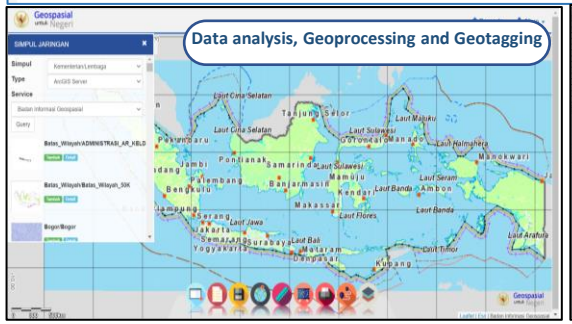
INA-GEOPORTAL as a national geoportal that connects various Ministries, Institutions, Provinces, and Regions that are partners in connecting the National Geospatial Information Network (JIGN) node. Users can use the features of data analysis, geoprocessing, geotagging, drag and drop data files with opensource-based mapviewer technology.

DATASET FEATURES:

- **Data analysis**
- **Geoprocessing**
- **Geotagging**
- **Downloading data including base map (administration, LULC, National DEM)**

One Map Policy Portal was developed by the Geospatial Information Agency (BIG)

BADAN INFORMASI GEOSPASIAL

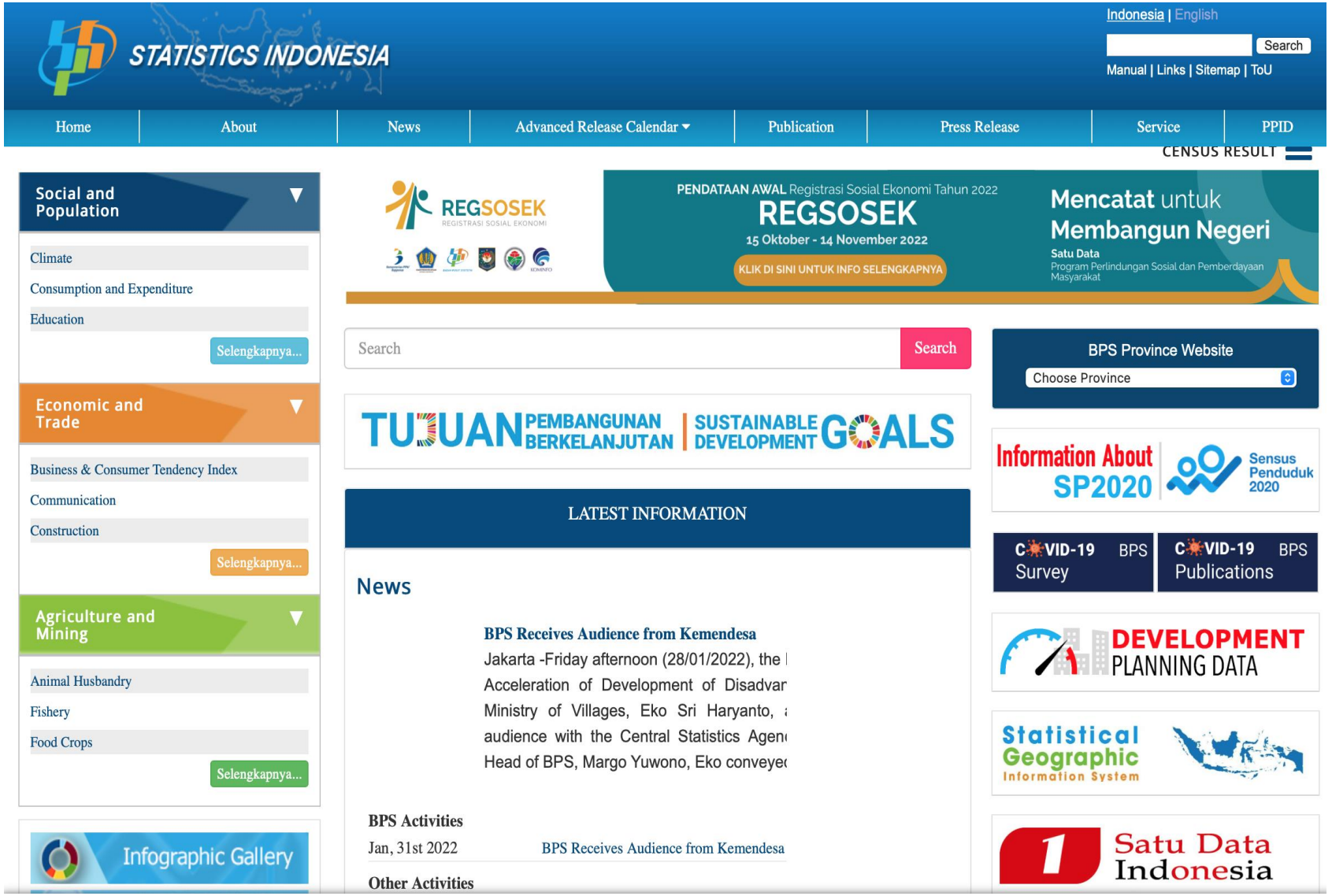


Access to Ina Geospatial Portal:
https://tanahair.indonesia.go.id/portal-web

STATISTIC INDONESIA

The data is derived from its comprehensive statistical activities, comprises of periodic information on structure and growth of economy, social change, and development.

Those statistics may be derived from its own researches and surveys as well as from other government department as secondary data.



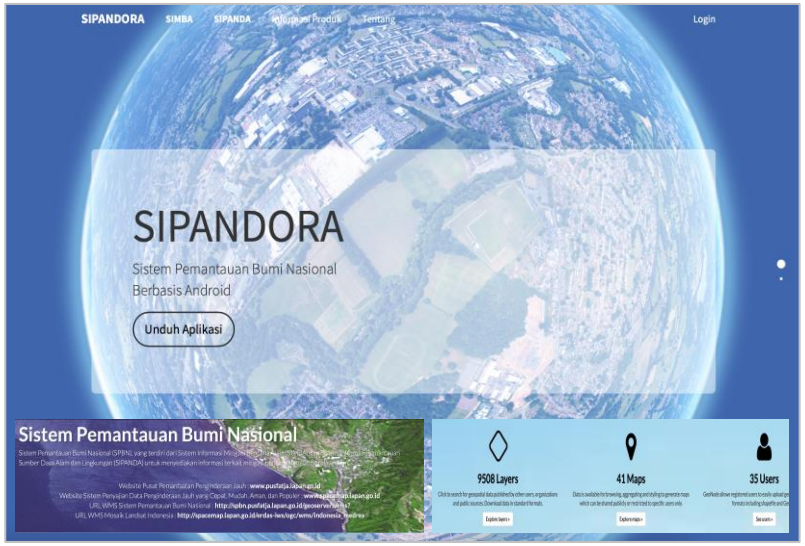
Access to Statistics Indonesia:
https://www.bps.go.id

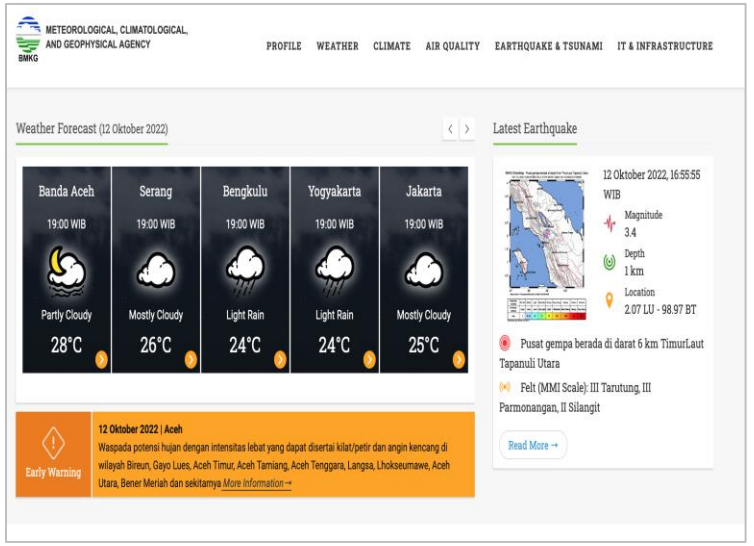
NATIONAL DATA GEOPORTAL FOR DISASTER

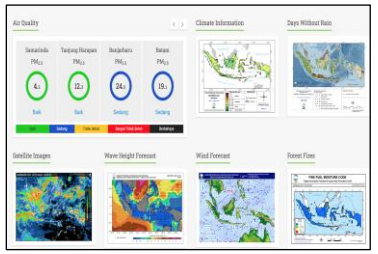
BRIN
BADAN RISET
DAN INOVASI NASIONAL

BNPB

BMKG





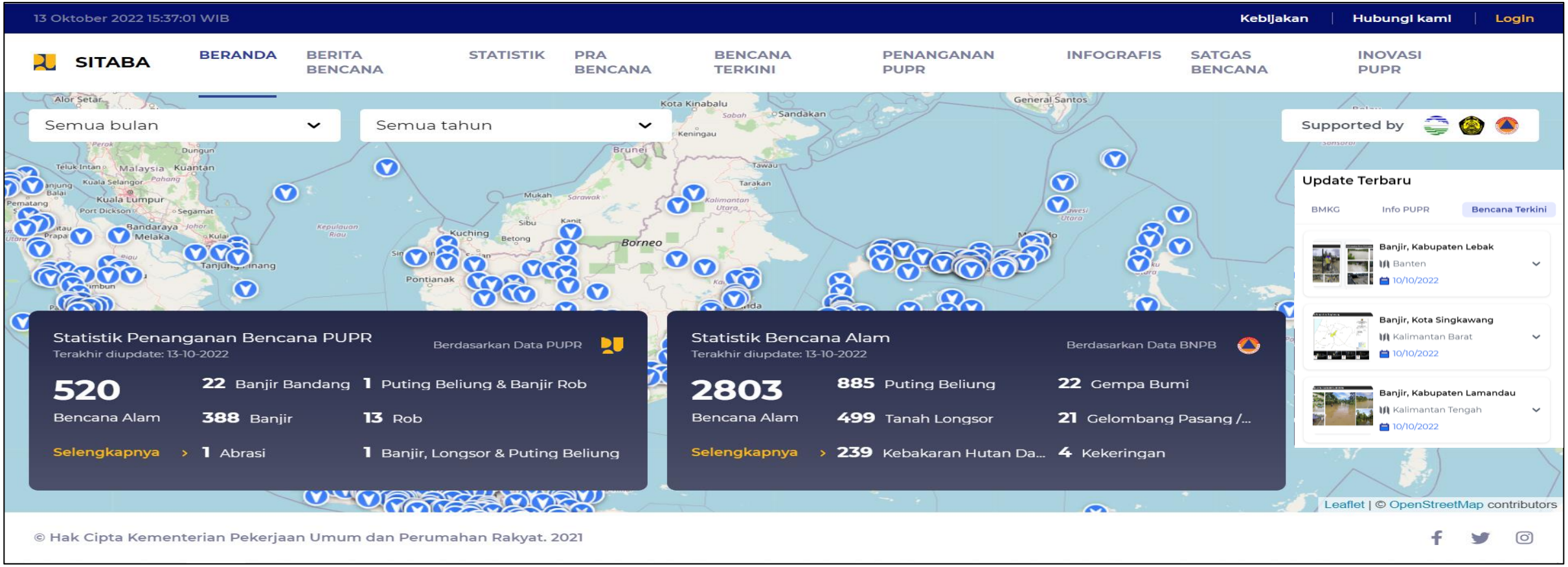


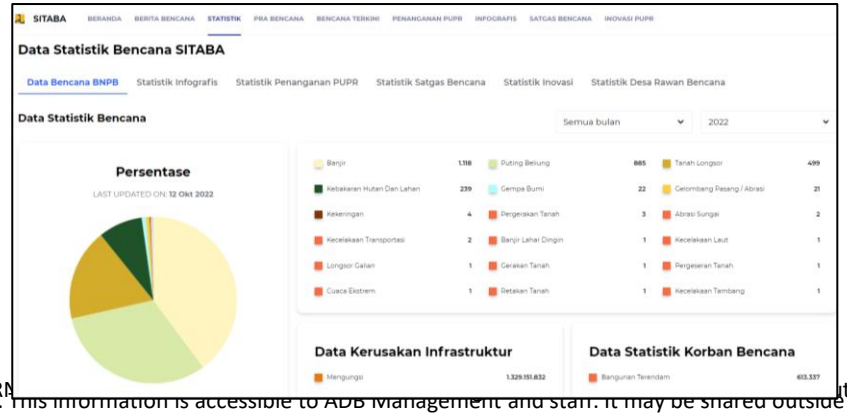
SIPANDORA: https://sipandora.lapan.go.id
Authority:
Feature:
- SIPANDA : Natural Resources & Environment Monitoring Information System
- SIMBA : Natural Disaster Mitigation Information System

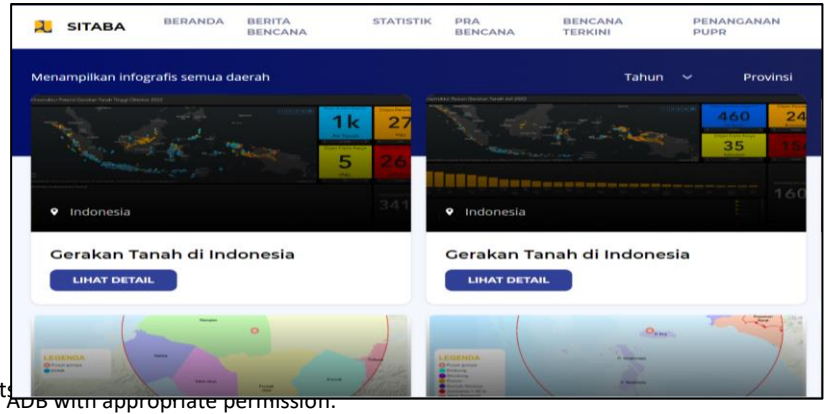
InaRISK: https://inarisk.bnpb.go.id/
Authority: National Agency for Disaster Countermeasure (BNPB)
Feature:
- Data analysis
- GIS Services
- Infographic
- Downloading tabular data

National Data Geoportal of BMKG: https://www.bmkg.go.id/
Authority: Meteorology, Climatology, and Geophysical Agency (BMKG)
- Feature:
- Statistic and Tabular data
- Web Map
- Tsunami Early Warning

NATIONAL DATA GEOPORTAL FOR DISASTER RESPONSE FOR INFRASTRUCTURE REHABILITATION







SITABA: https://sitaba.pu.go.id
Authorithy: Ministry of Public Works and Housing (PUPR)
Feature:

- Statistic and Tabular data
- Web Map of disaster management (mitigation, preparation, response, recovery) and rehab/recon carried out by PUPR

Engage the National Data Geoportal and the Remote Sensing Services

PROJECT FOCUS AREA

- **NORTH JAVA COASTAL AREA**

- **COVERS** : 2 RIVER BASINS

- Cimanuk-Cisanggarung River Basin
- Jratun Seluna River Basin

Coastal flood reach 5-200 cm, amplified by land subsidence

Land subsidence rate in main cities reaches 1-20 cm/year.

Water Balance 2016, (-) showing the Deficit Water

- **OPPORTUNITY: Cover for National Area**

COLLABORATION-PARTNERSHIP

- **IMPLEMENTING UNIT:**

Flood Management And Coastal Protection In North Java Project

- **RELEVANT AGENCIES**

BADAN INFORMASI GEOSPASIAL, BMKG, BNPB, BPPT

- **LOCAL GOVERNMENT**

Flood Management And Coastal Protection In North Java Project

19 Districts/Cities

2 Provinces

Indramayu, Cirebon, Kota Cirebon, Sumedang, Majalengka, Brebes, Garut, Kuningan, Semarang, Salatiga, Boyolali, Sragen, Grobogan, Blora, Demak, Kudus, Pati, Rembang

Others....

- **UNIVERSITIES**

ITS

Others....

- **REMOTE SENSING AGENCIES**

esa European Space Agency

Others....

ACTIVITIES

SC 1.B : EARTH OBSERVATION SERVICES FOR FMCPNJP

THE REMOTE SENSING APPLICATION OF INTEGRATED SPATIAL MONITORING FOR NORTH JAVA COASTAL AND SELECTED RIVER BASIN

- Long-term remote sensing records of land use-land cover, historical hydrology data
- Integration data and hydrological models for Enhanced the Flood Risk in River Basin Management.
- Developing the Methodology of National Platform for the Coastal Area and River Basin Monitoring .
- Integration the monitoring result in national monitoring and early warning systems
- Monitoring the critical water resource infrastructures for the safety & security

ENHANCED CAPACITY ON REMOTE SENSING APPLICATION FOR RIVER BASIN MANAGEMENT

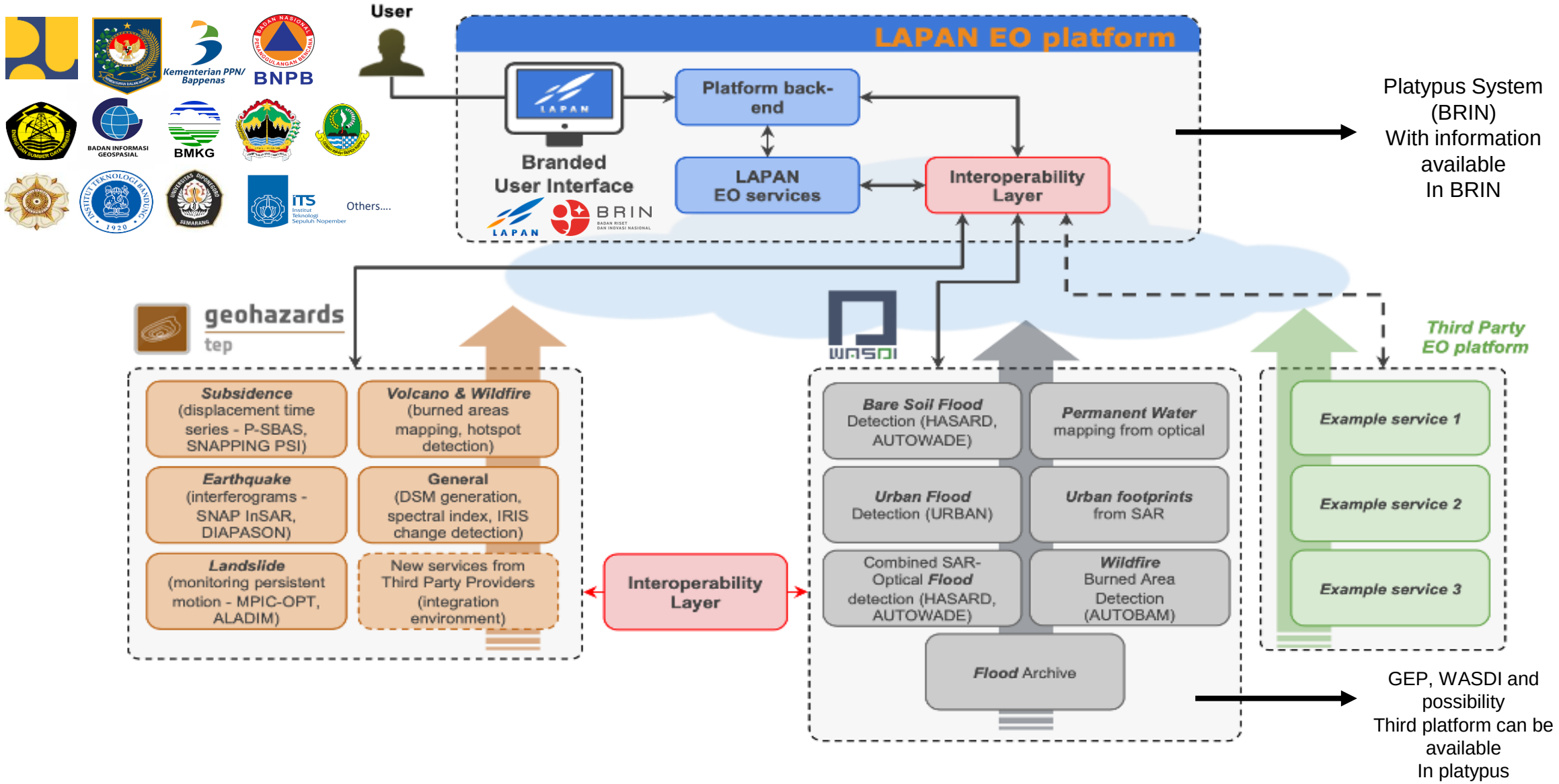
- Establish the Integrated Join Spatial Monitoring for North Java Coastal and Selected River Basin
- Transfer knowledge transfer and capacity building (National).
- Transfer knowledge transfer and capacity building (International)

OUTPUT

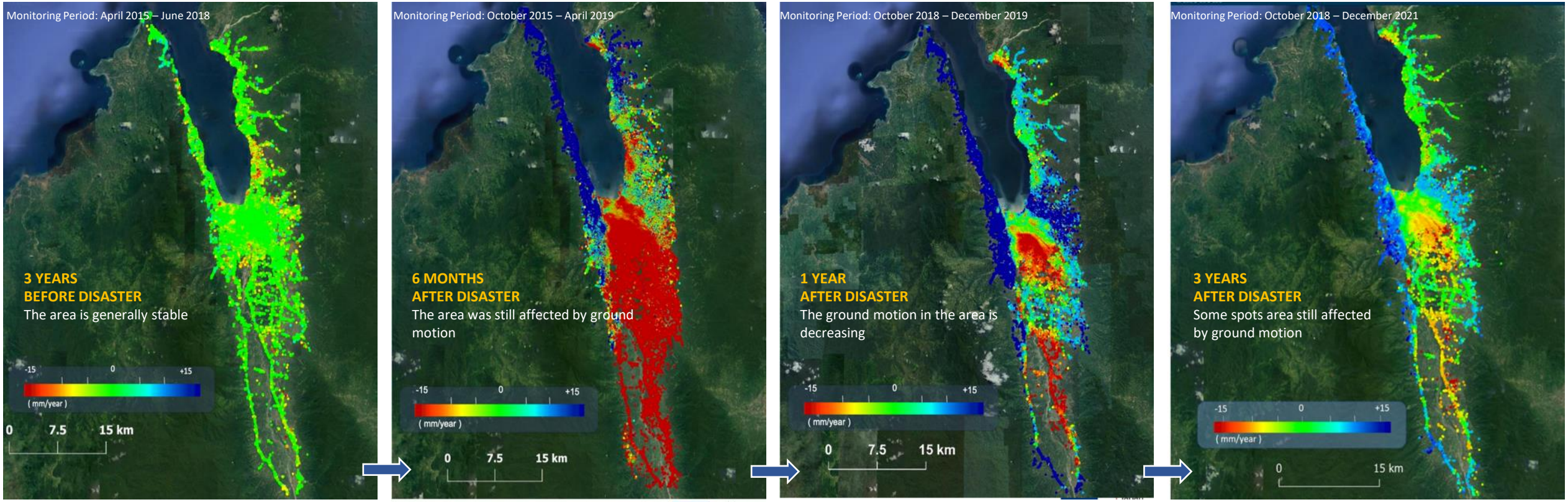
- LANDCOVER CHANGE
- FLOOD EVENT
- WATER SURFACE MONITORING
- UPDATED GUIDELINE OF REMOTE SENSING
- CIVIL WORKS MONITORING
- SOFT COMPONENT MONITORING
- INTEGRATION REMOTE SENSING, HYDROLOGI, AND FLOOD EARLY WARNING SYSTEM
- IMPROVEMENT OF NATIONAL PLATFORM OF REMOTE SENSING
- CAPACITY BUILDING

- **PROVIDE A BETTER DATA, BETTER PROJECT DESIGN AND SOLUTION**
- **PROVIDE EARTH OBSERVATION-BASED PLATFROM**
- **IMPROVE THE NATIONAL DATA PORTAL**

PROPOSED EARTH OBSERVATION PROCESSING SERVICE FOR DISASTER MANAGEMENT IN INDONESIA



EO APPLICATION – LAND MOVEMENT



The ground deformation analysis consists in the Multi-Temporal Interferometry processing of the Sentinel-1 images acquired in Descending orbit over Palu from 2015 – December 2021 through the Rheticus® Displacement service.

RHETICUS

Rheticus® is an automatic, cloud-based, geoinformation service platform. It's carefully designed to deliver insight accurate information, on our ever-changing world.

RHETICUS® BUILDING CHECK

Rheticus® Building Check provides predictive analysis of any building movement patterns within the monitored area of interest while also timely tracking any anomaly and its evolution over time. Building Check delivers periodic reports based on constant monitoring that allows quick detection of structural instability, supporting the local authorities in charge of the buildings management.

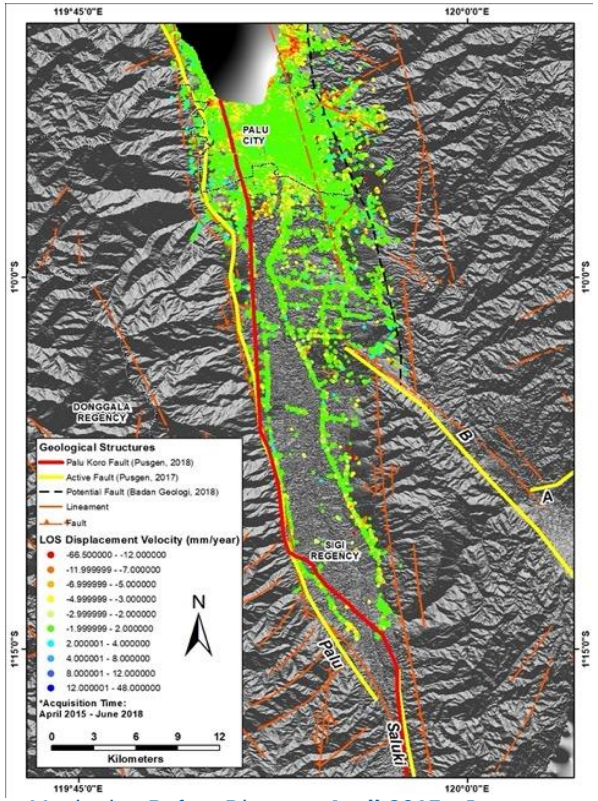
- Land movement maps and stability analysis have been extensively used to inform planning and engineering designs and to support the implementation of BUILD BACK BETTER

INTERNAL. This information is accessible to ADB Management and staff. It may be shared outside ADB with appropriate permission.

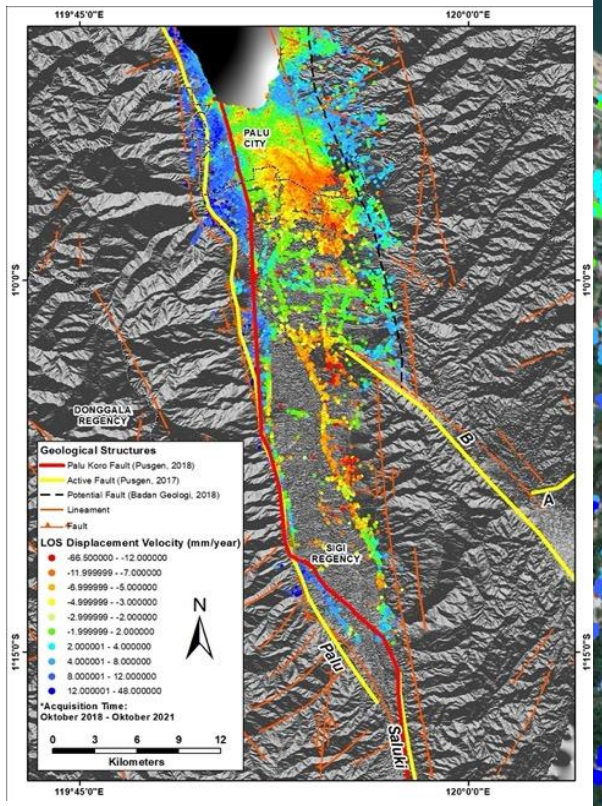
LAND MOVEMENT MONITORING IN SUPPORTING THE REHABILITATION OF THE ISLAMIC STATE INSTITUTE

MAIN BUILDING BACK BETTER ELEMENTS:

- DESIGN CHALLENGES
- GREEN CAMPUS AND BUILDING DESIGN
- DISASTER-RESILIENT DESIGN
- GENDER-RESPONSIVE AND INCLUSIVE DESIGN FEATURES

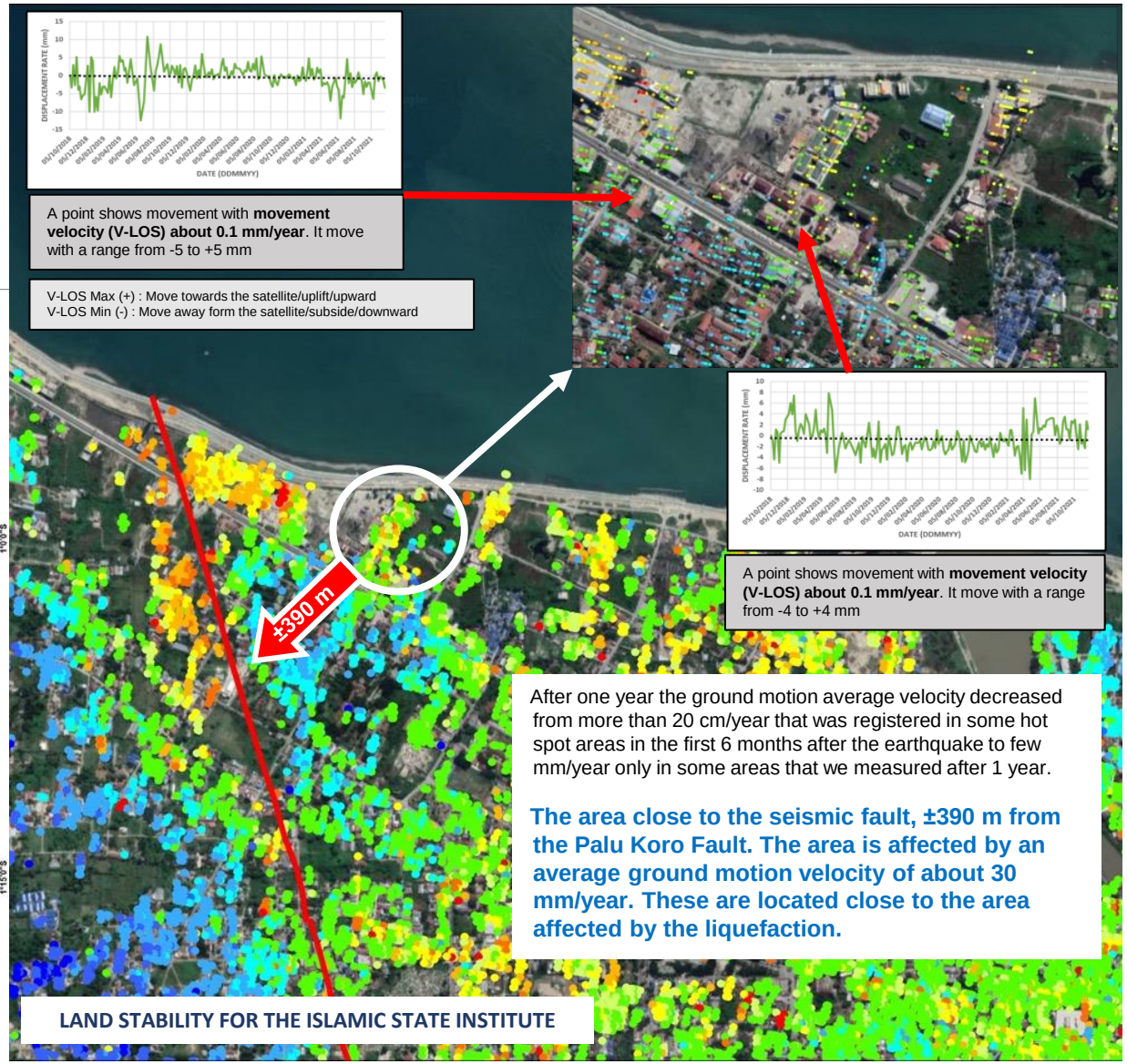


- Monitoring Before Disaster: **April 2015 - June 2018**



- Monitoring After Disaster: **October 2018- October 2021**

LOCATION OF ISLAMIC STATE INSTITUTE



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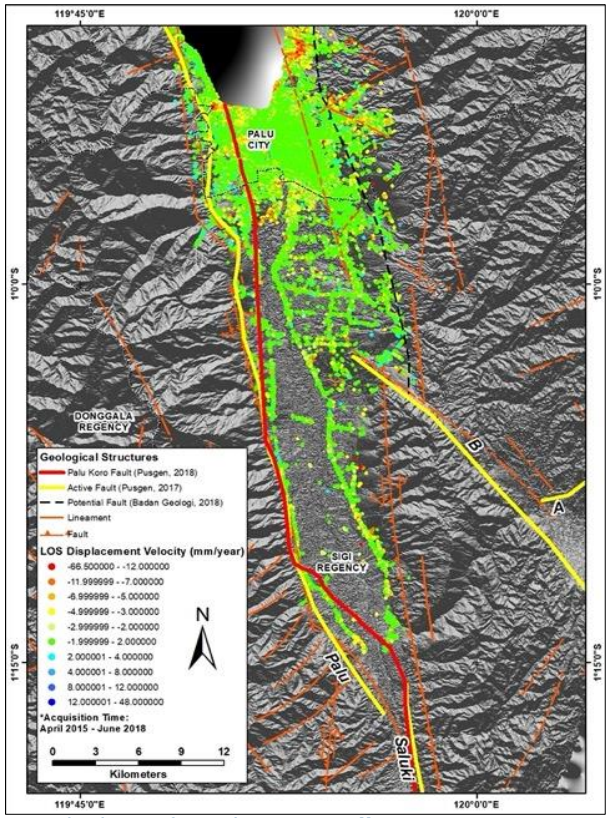
EO APPLICATION – LAND MOVEMENT

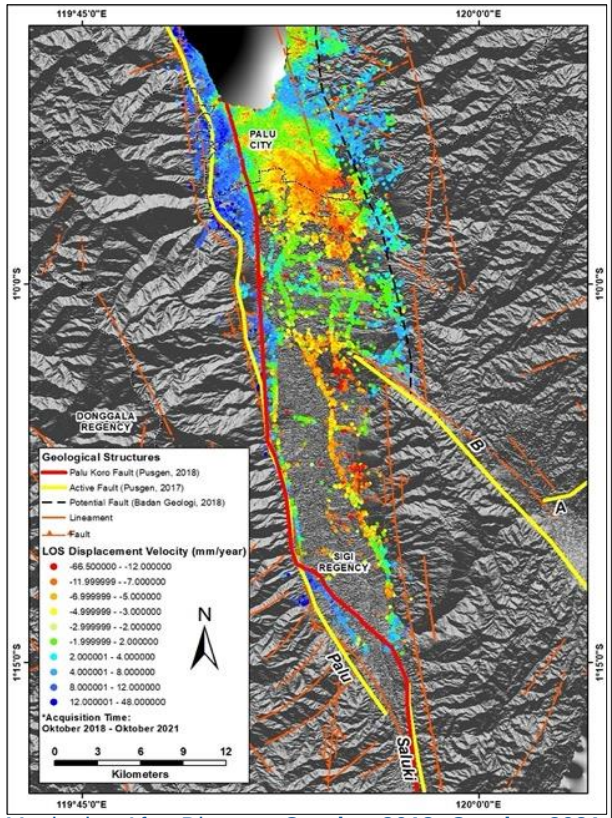
LAND MOVEMENT MONITORING IN SUPPORTING THE REHABILITATION OF PASIGALA RAW WATER SUPPLY SYSTEM

MAIN BUILDING BACK BETTER ELEMENTS

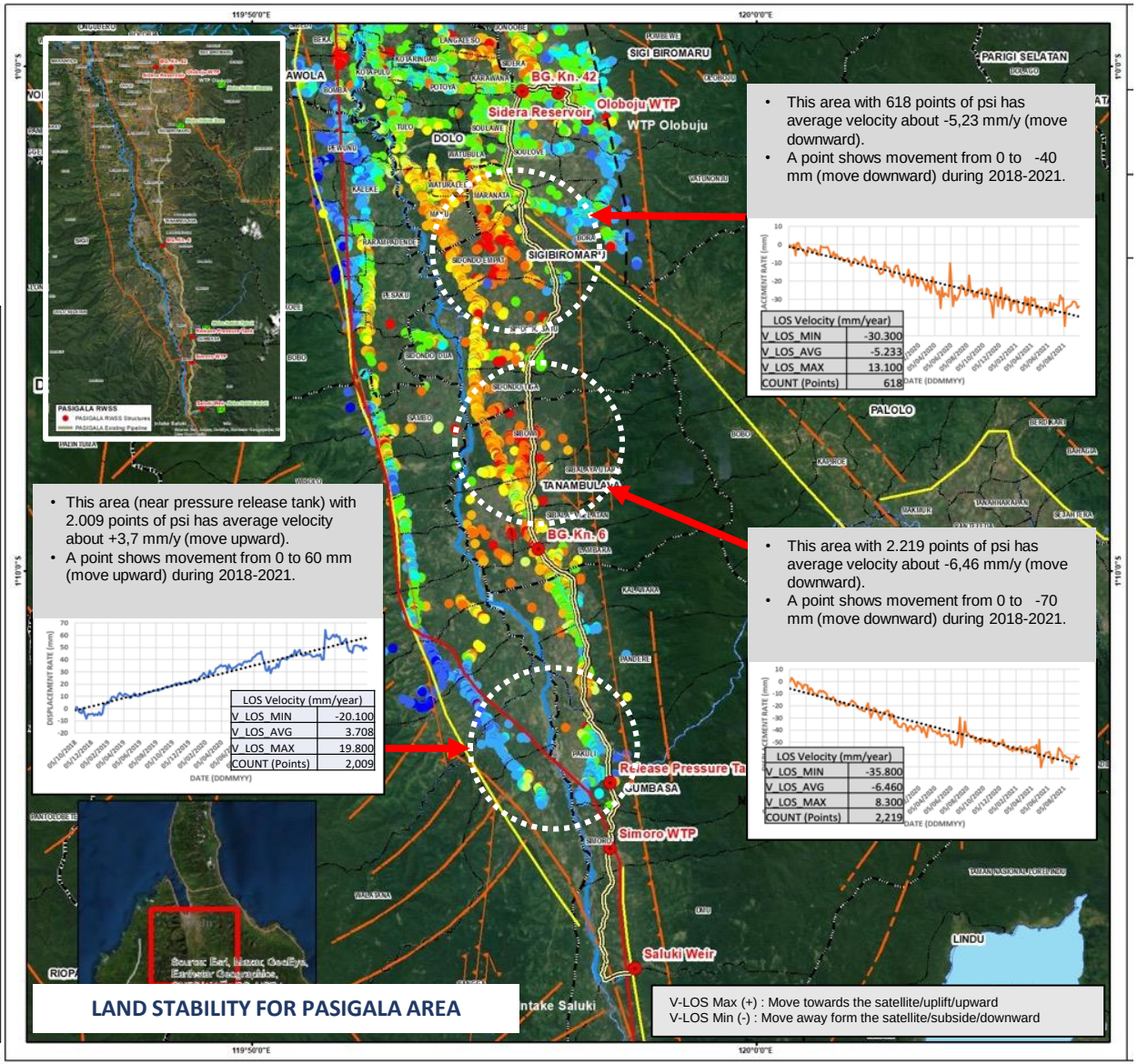
- INCREASED RAW WATER SUPPLY
- EARTHQUAKE/ LIQUEFACTION RESISTANCE OF THE NEW TRANSMISSION PIPELINE
- ENHANCING EARTHQUAKE/ LIQUEFACTION RESISTANCE OF THE EXISTING TRANSMISSION PIPELINE
- PIPELINE MANAGEMENT AND LEAK DETECTION SYSTEM.



- Monitoring Before Disaster: **April 2015 - June 2018**



- Monitoring After Disaster: **October 2018- October 2021**



LOCATION OF PASIGALA RAW WATER SYSTEM

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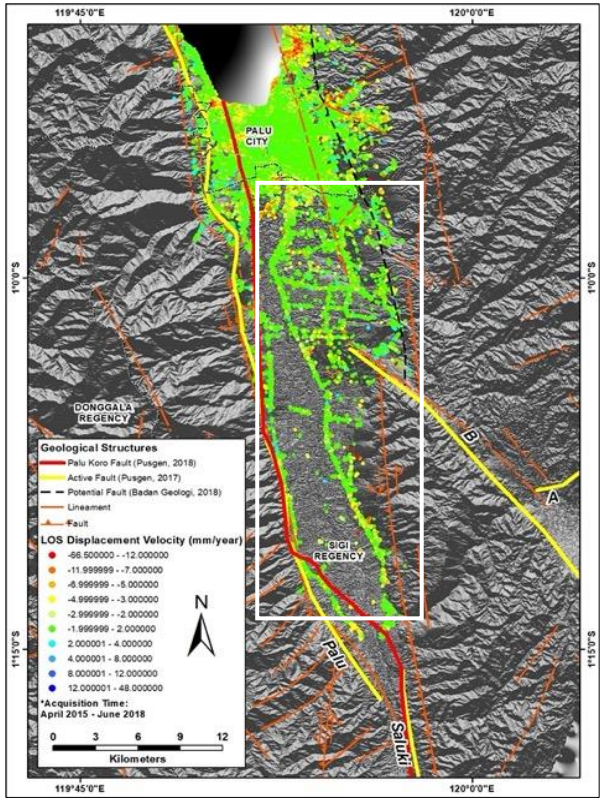
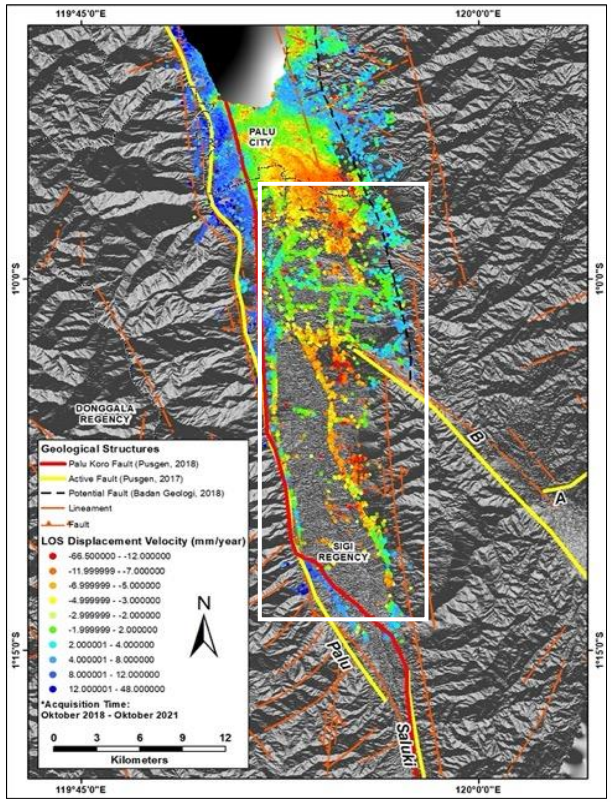
EO APPLICATION – LAND MOVEMENT

LAND MOVEMENT MONITORING IN SUPPORTING THE REHABILITATION OF GUMBASA IRRIGATION SYSTEM

MAIN BUILDING BACK BETTER ELEMENTS

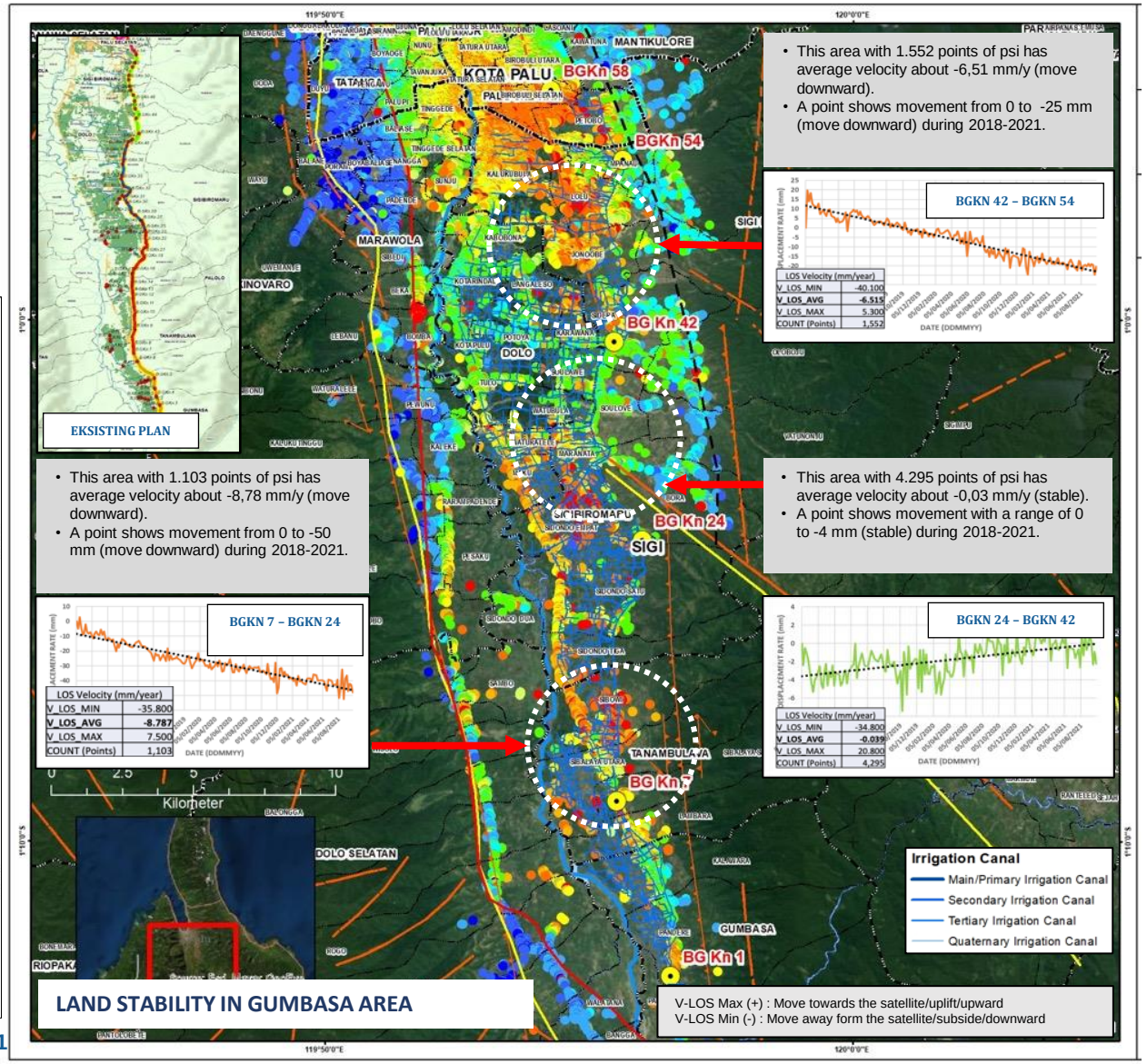
- THE REDESIGN SHOULD BE CONSISTENT WITH THE LEVEL OF DAMAGE
- REDESIGN OF THE MAIN CANAL
- MAIN CANAL STRUCTURES
- SECONDARY CANAL REPLACEMENT





- Monitoring Before Disaster: **April 2015 - June 2018**
- Monitoring After Disaster: **October 2018- October 2021**

LOCATION OF GUMBASA IRRIGATION SYSTEM



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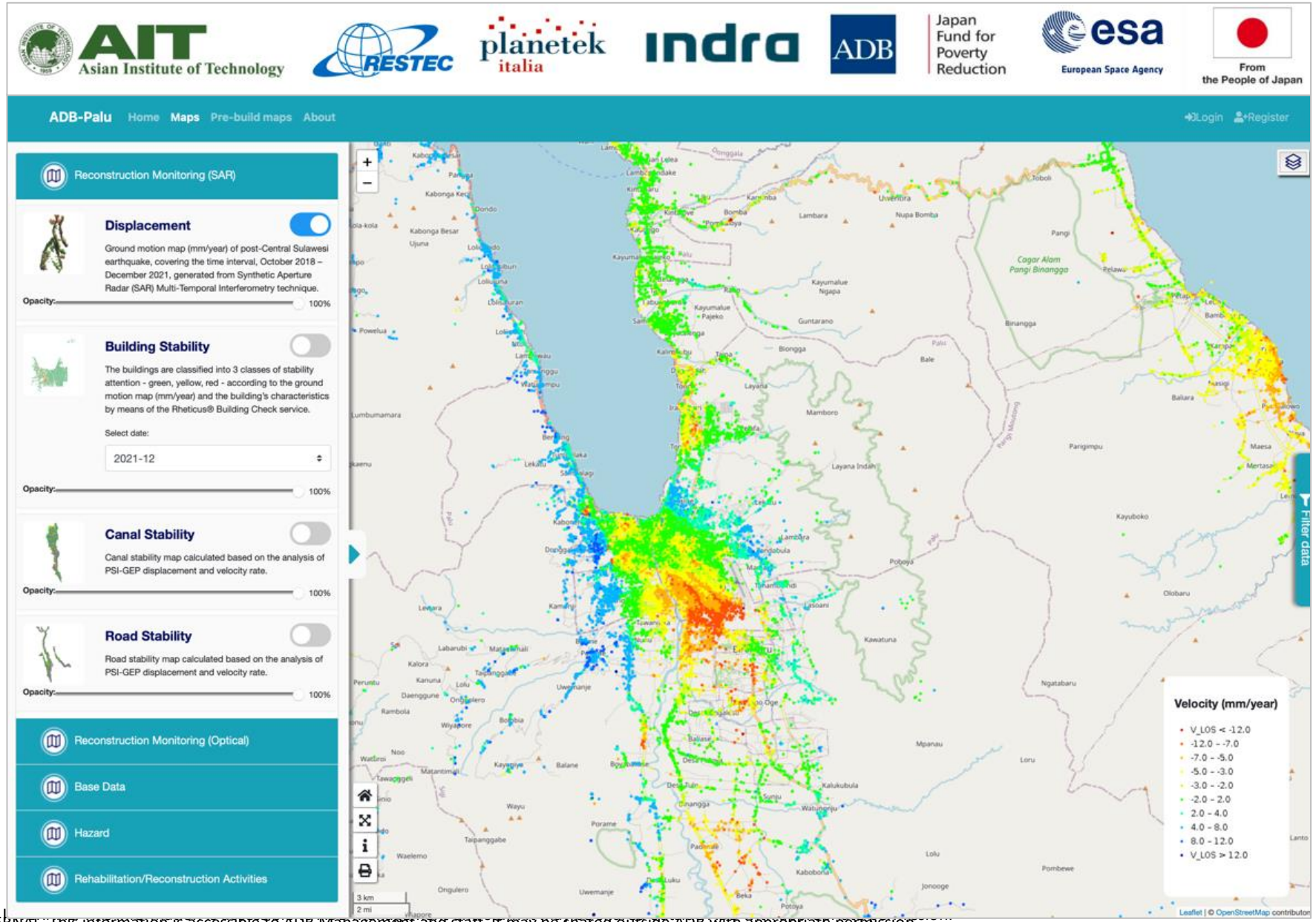
GEOPORTAL FOR MONITORING REHABILITATION AND RECONSTRUCTION IN PALU



- The Project Geoportal supports the reconstruction monitoring by providing a user-friendly and interactive visualization platform for an efficient and up-to-date information.
- The Capacity Building and Transfer Knowledge has been delivered in collaboration with ADB/ESA-AIT and ORPA.

INSTABILITY AND GLOBAL CHALLENGE FOR MAINTENANCE

- Operators and authorities spend a lot of money fighting against **structural problems** due to natural or human-induced **land instability**;
- Land instability may cause structural damages and failures to roads and bridges, increased maintenance and repair costs, disruptions of service, accidents and casualties;
- **Ground displacement** is one of the best indicators for the likelihood of failure;
- The use of traditional techniques for periodic monitoring of wide networks requires **considerable economic and time resources**;
- Generally, surveys and inspections are performed when the **problems have already occurred** (i.e. damage or failure) due to lack of predictive info about what/where to inspect.

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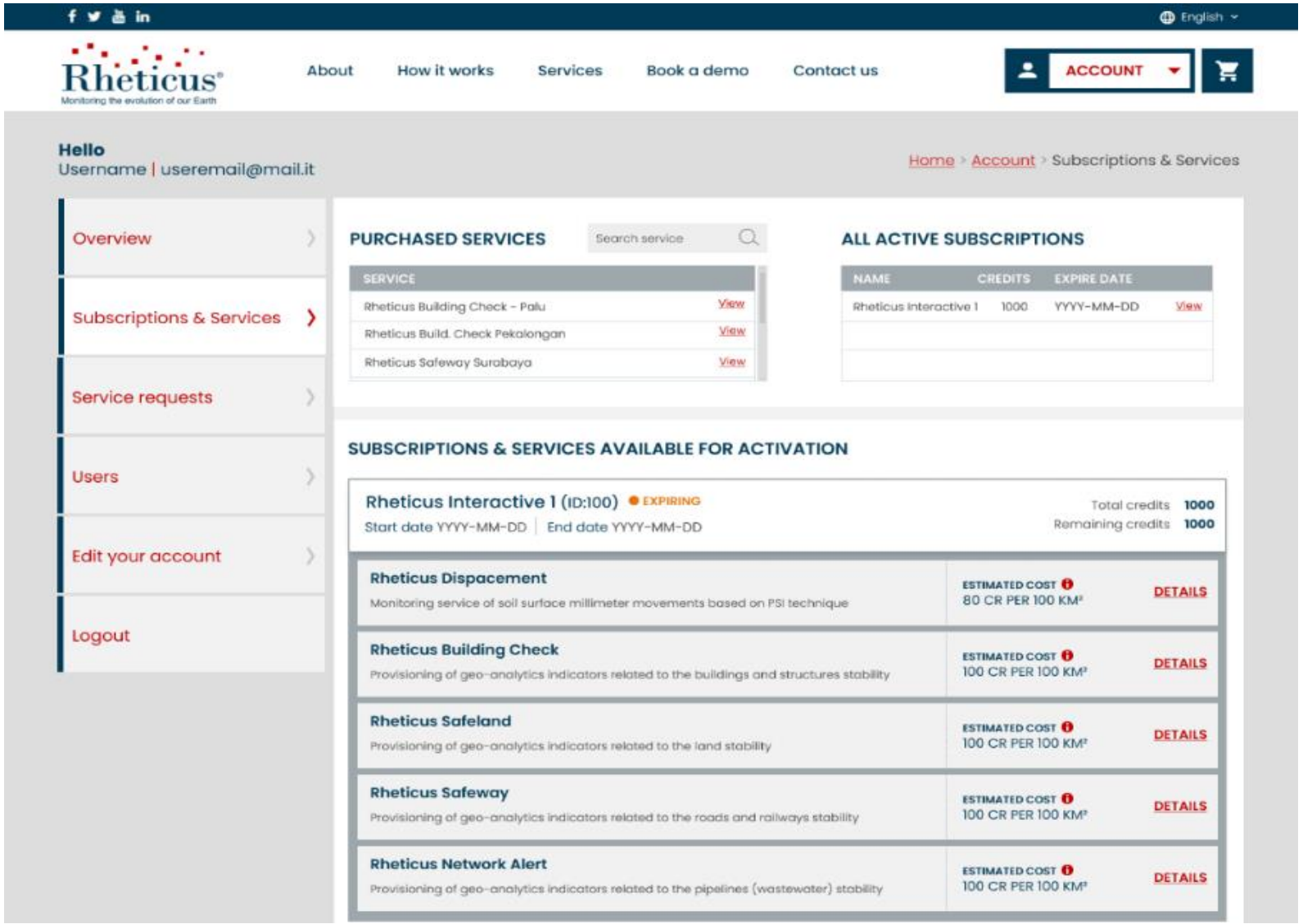
RHETICUS INTERACTIVE



- Rheticus® is a cloud platform developed and operated by Planetek Italia, which provides geoinformative services for monitoring the evolution of the earth's surface, safeguarding infrastructures and protecting natural resources, using satellite images acquired periodically.
- The Rheticus® Interactive platform:
- Allows the end-user to manage the Rheticus® activations through processing credits.
- Allows users to request autonomously the activation of the Rheticus® services of own interest.

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BRIDGING THE GAP BETWEEN GEO-SPECIALISTS AND OPERATIONS

Transportation

Utilities

Insurance / Property Management

Natural Risk Management

- Geospatial interactive dashboard with key indicators and alerts
- Historical time-series analysis and continuous updates
- Predictive analytics, actionable information
- Cloud-hosted info-as-a service subscrition

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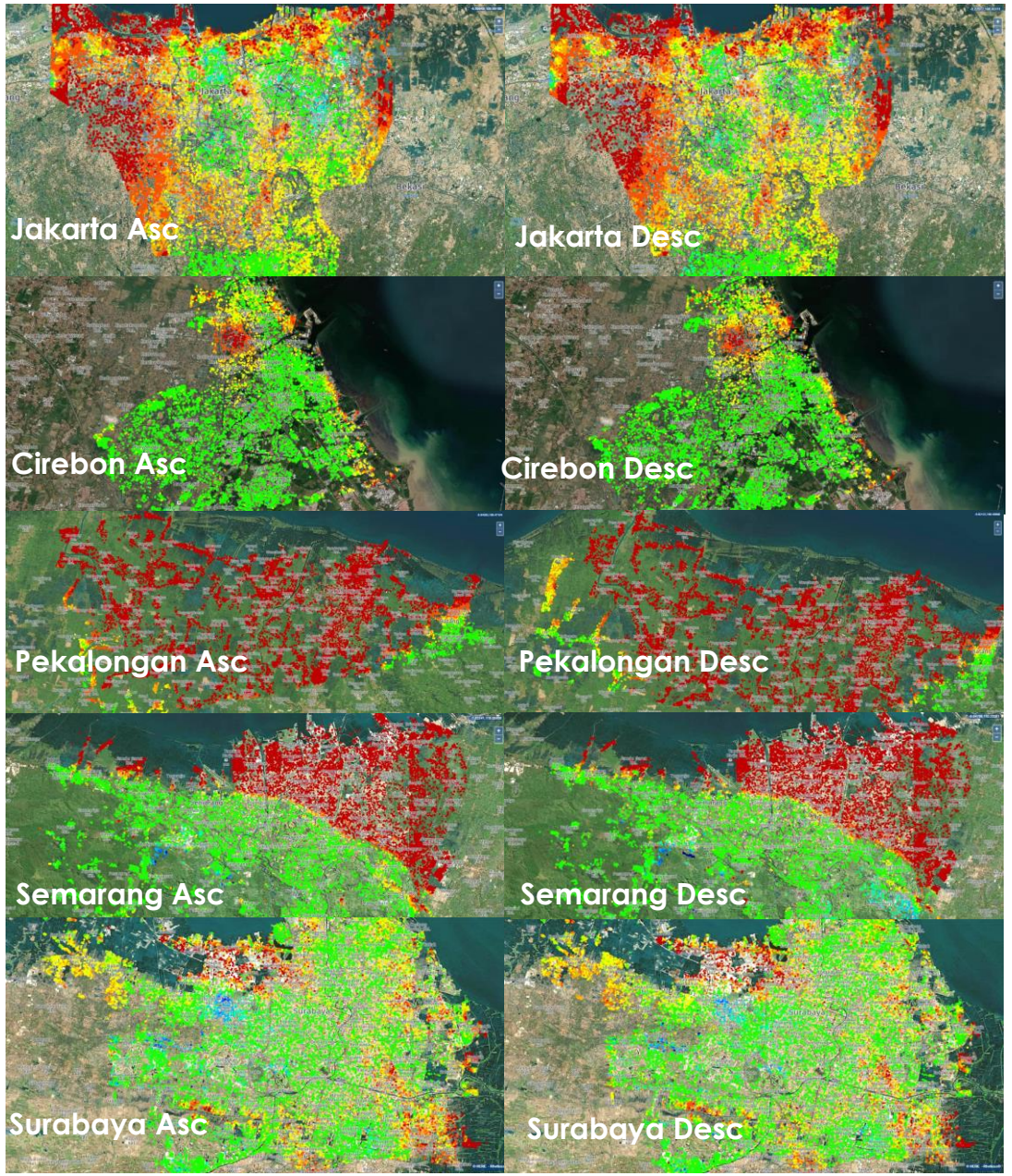
RHETICUS BUILDING CHECK

- **Areas of Interest:**
  - Jakarta
  - Cirebon
  - Pekalongan
  - Semarang
  - Surabaya

- **Data used:**
  - Satellite: Sentinel-1
  - Orbit: Ascending and Descending
  - Period: April 2015 – June 2021

- **Methodology;**
  The ground motion map obtained through the Rheticus® cloud platform that implements the Persistent Scatterers Interferometry technique, identifies zones and infrastructures more/less prone to instabilities. The ground motion map contains the average velocity of the measured points called Persistent Scatterers (PS) and Distributed Scatterers (DS) highlighting the areas and infrastructures that are moving with respect to the others that are stable.
  The measured points are thematized based on the average velocity along the satellite Line-of-Sight (LOS), according to the following colour ramp:



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Rheticus®
RHETICUS BUILDING CHECK

Rheticus® Building check – Building stability Methodology

The buildings are classified in into 4 motion classes (Red, Yellow, Green, N/A) according to the normalized building motion Score[min: 0 – max:1] that is provided for each building.

FROM THE DISPLACEMENT MEASUREMENTS → **TO THE BUILDING STABILITY LAYER**

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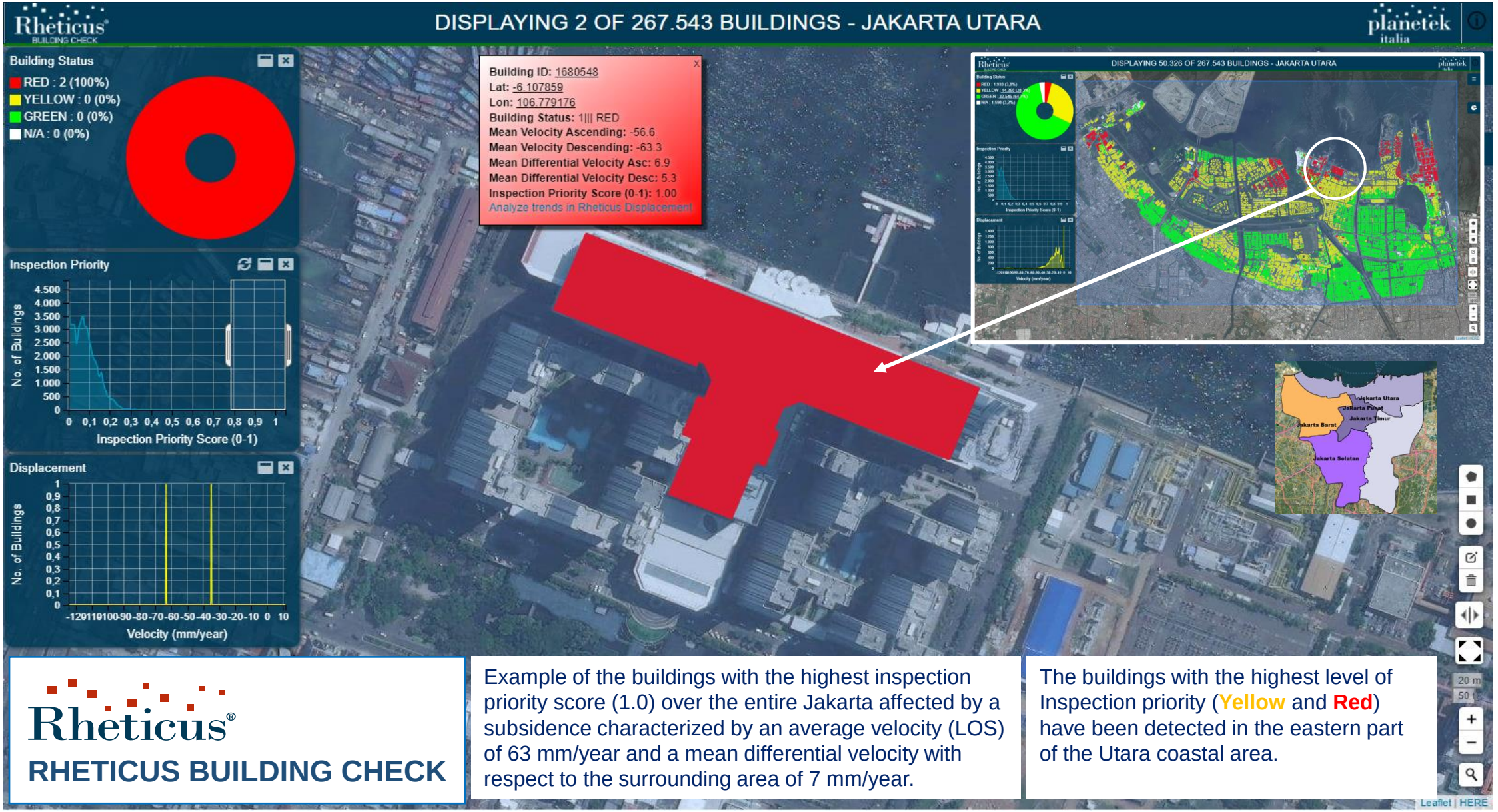
BUILDING STABILITY INSPECTION – NORTH JAKARTA CASE



Rheticus®

RHETICUS BUILDING CHECK

Example of the buildings with the highest inspection priority score (1.0) over the entire Jakarta affected by a subsidence characterized by an average velocity (LOS) of 63 mm/year and a mean differential velocity with respect to the surrounding area of 7 mm/year.

The buildings with the highest level of Inspection priority (**Yellow** and **Red**) have been detected in the eastern part of the Utara coastal area.

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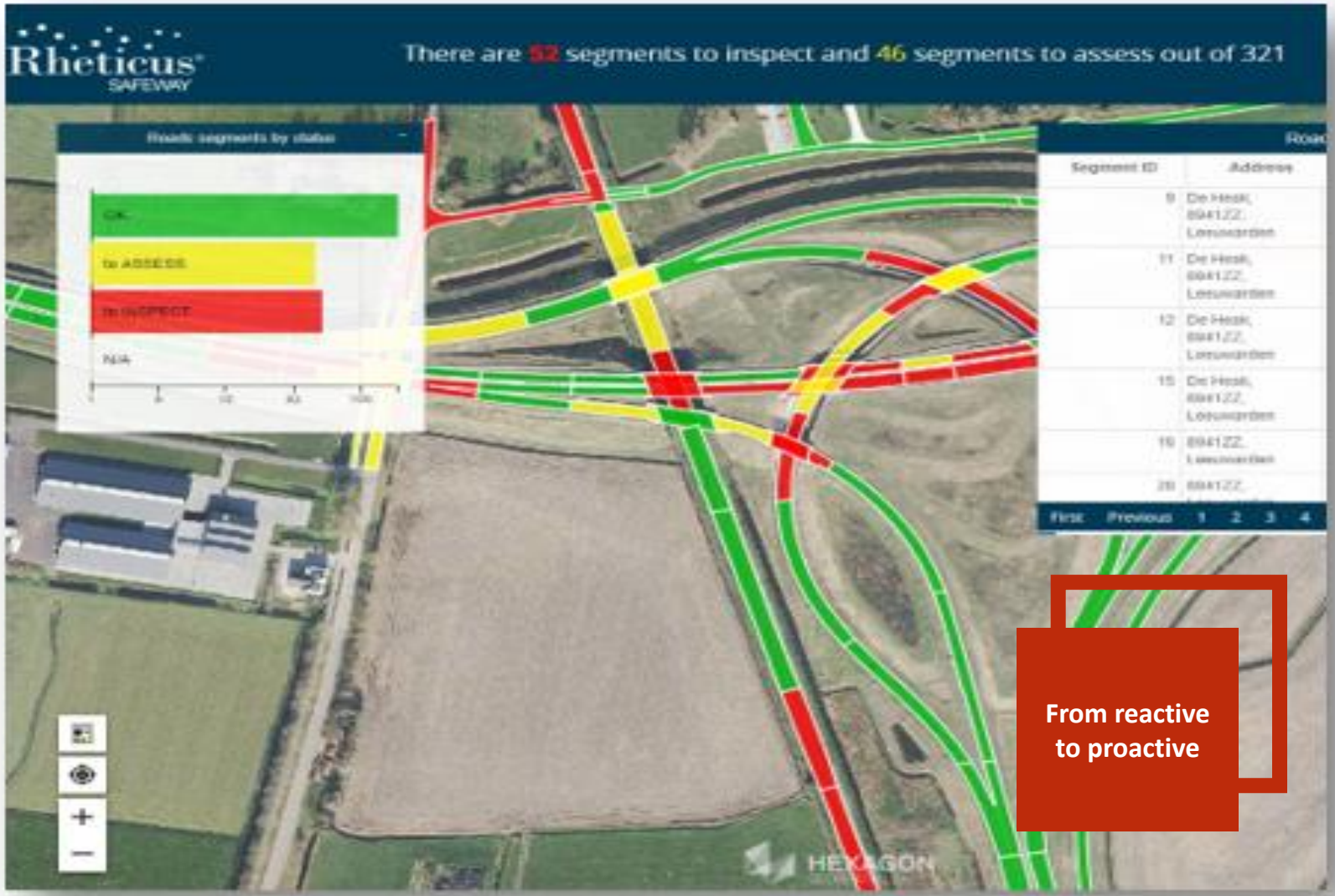
Rheticus SAFEWAY

Inspection priority insights for roads and railways operator



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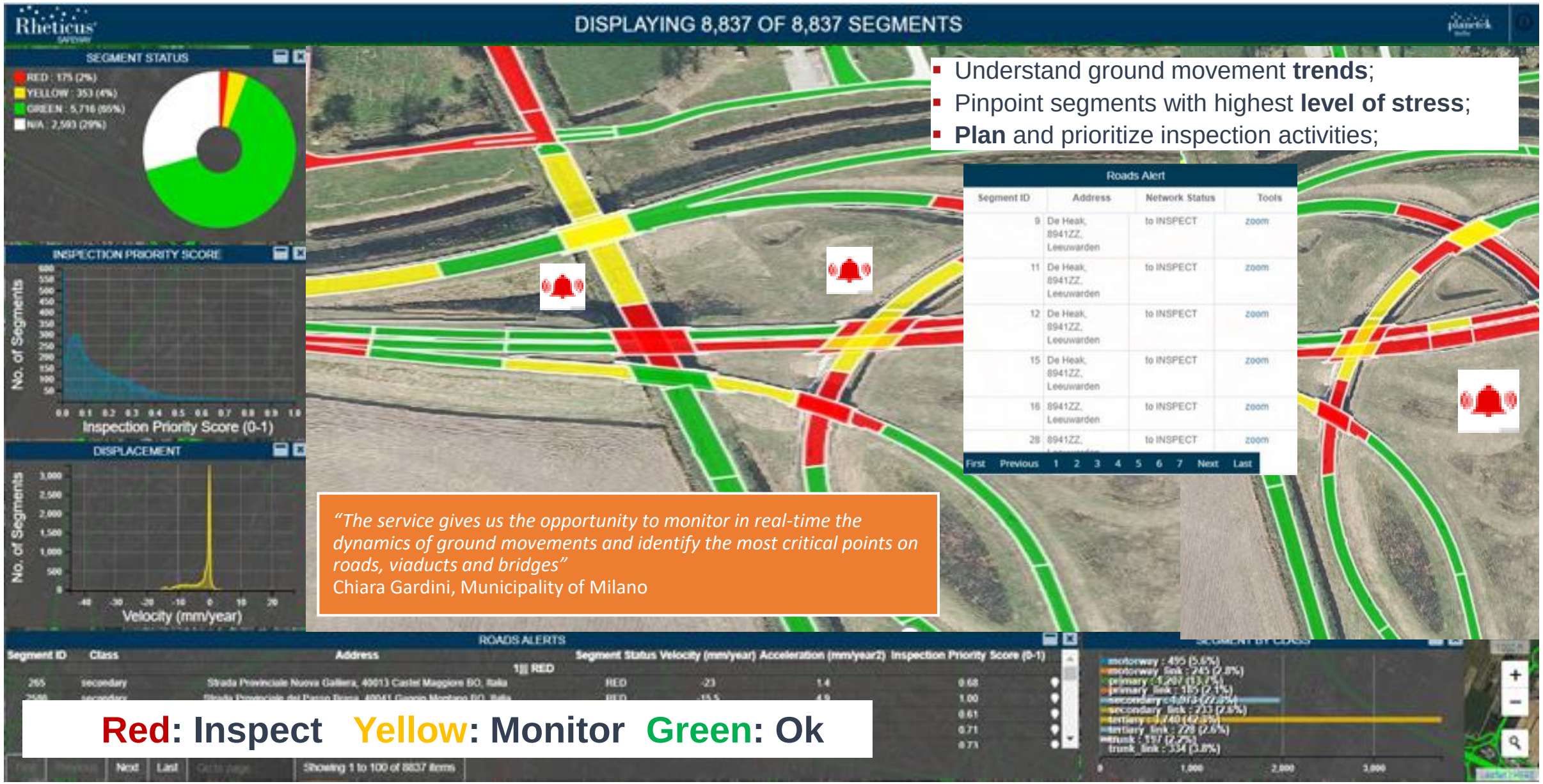
MAINTENANCE: FROM REACTIVE TO PROACTIVE



- Understand ground movement **trends**;
- Pinpoint segments with highest **level of stress**;
- **Plan** and prioritize inspection activities;

"The service gives us the opportunity to monitor in real-time the dynamics of ground movements and identify the most critical points on roads, viaducts and bridges"
Chiara Gardini, Municipality of Milano

Red: Inspect Yellow: Monitor Green: Ok

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THANK YOU

www.adb.org | **www.esa.int**