

UN Sustainable Development Goals (SDGs) – Indonesian national monitoring activities and international contribution potential of weather and cloud independent radar satellite monitoring and services

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Role of **LAPAN** as the national remote sensing data provision begins from:



The Presidential Instruction No. 6/2012

LAPAN is obligated to provide high resolution remote sensing data (resolution less than 4 meters) with the Indonesia Government license.



The Law No. 21/2013 on Space Activities

- LAPAN should develop *National Remote Sensing Data Bank*.
- Methodologies of remote sensing data and information processing should refer to LAPAN regulation.



The Government Regulation. No. 11/2018

Regulation on the procedure of remote sensing data acquisition; data processing; data storing and distribution; and data applications and information dissemination.

User needs

Digital services
strategy



Provide an easy **access**
to **multi-source** data
through **platforms**

e.g.

TerraSAR

Landsat

SPOT

Pleiades

Terra, Aqua



Develop **digital services**
as a key growth engine

e.g.

DaaS

SaaS

PaaS

Ortho Services

Data Cubes

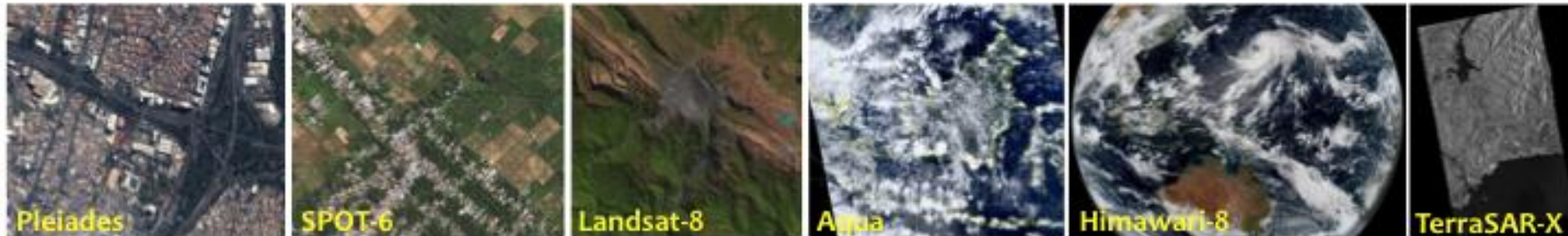
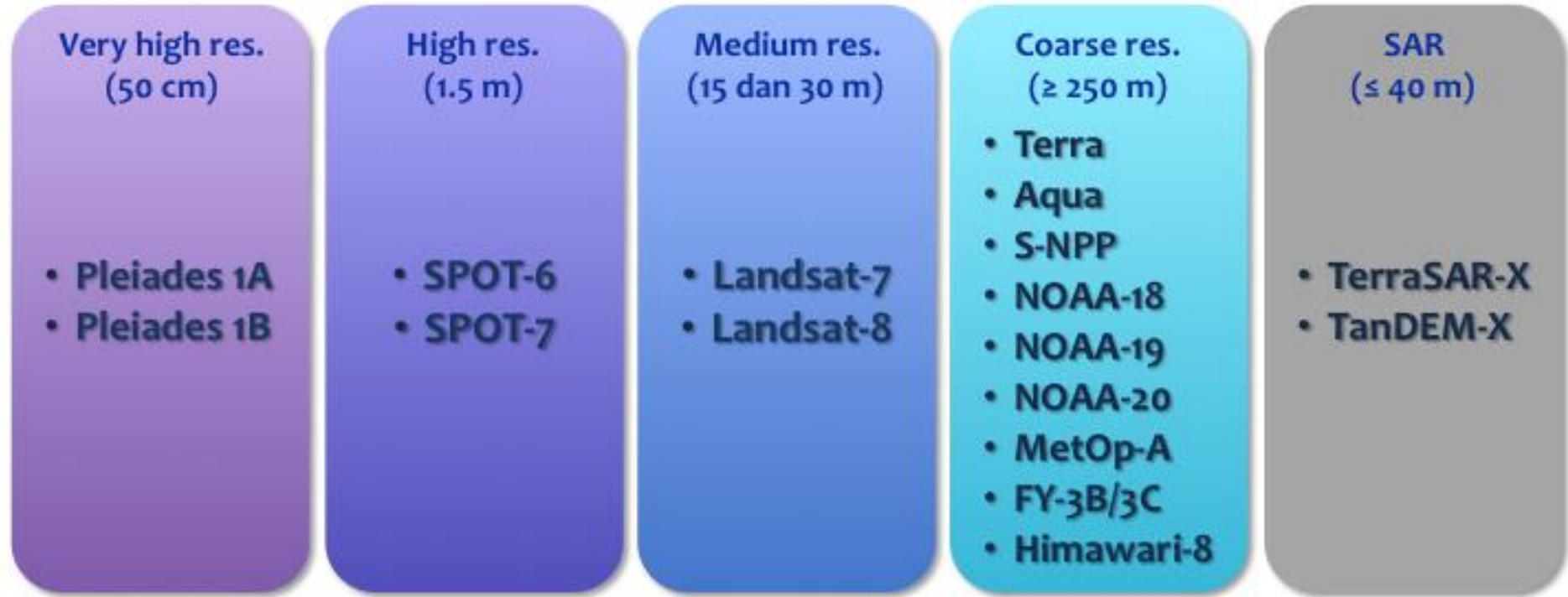


Promote **innovative**
solutions

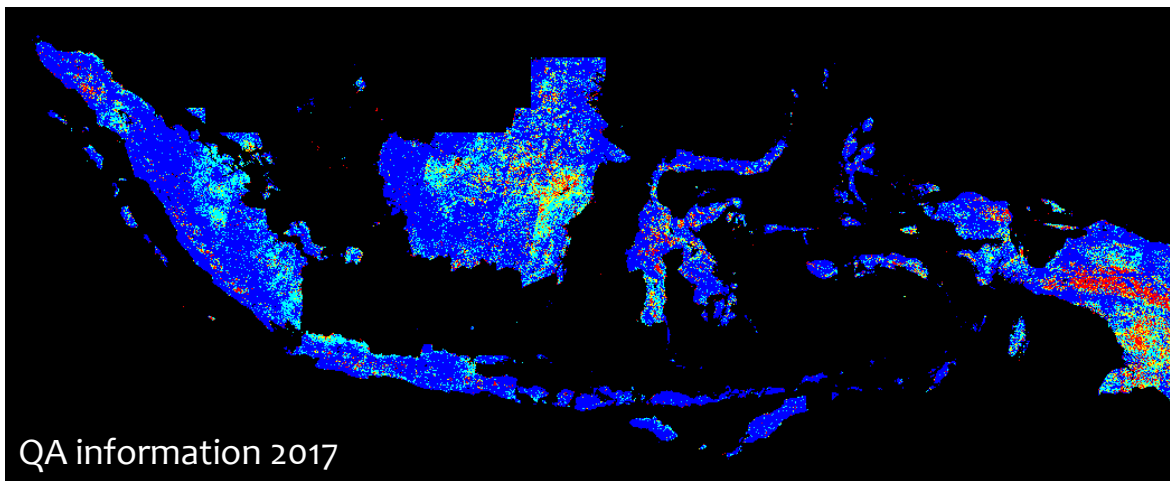
e.g.

Innovation challenges
Capacity building support
Partner solutions
AIRBUS solutions

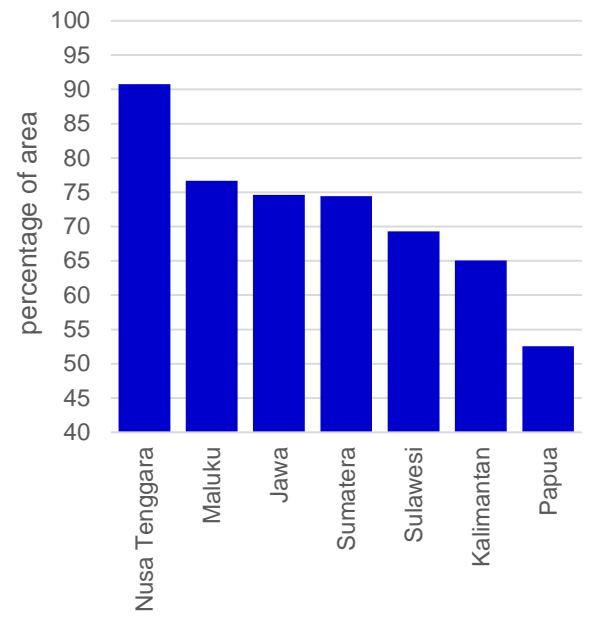
Current optical and SAR data acquired at LAPAN Remote Sensing Ground Stations



Quality Assurance (QA) statistics for Indonesia “cloud-free mosaic” using optical data



Statistics of QA for Q1 class information



Legend:


- : Q1- high confident clear pixel ≥ 4 data
- : Q2- medium confident clear pixel ≥ 4 data
- : Q3- hazy pixel ≥ 4 data
- : Q4- very hazy pixel ≥ 4 data
- : Q5- high confident cloud

Note: There are 23 Landsat-8 data/pixel/year.

TerraSAR-X/ TanDEM-X data availability for 2017 – 2018 Q3



 : Data of 2017 (1.046.163 km²)

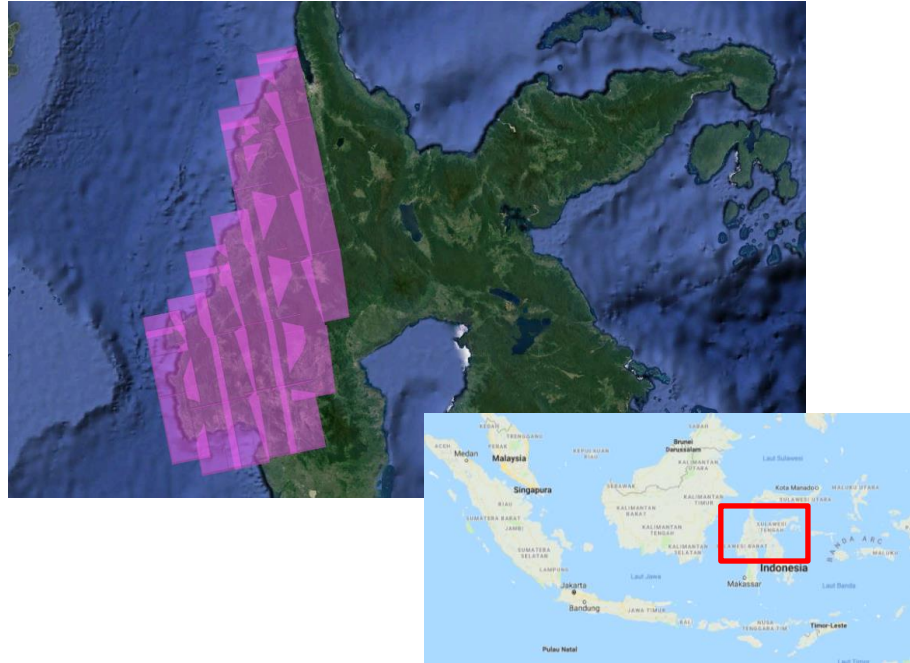
 : Data of 2018 Q3 (958.440 km²)

Note: TerraSAR-X/TanDEM-X data acquisition ~ 1.000.500 km²/year

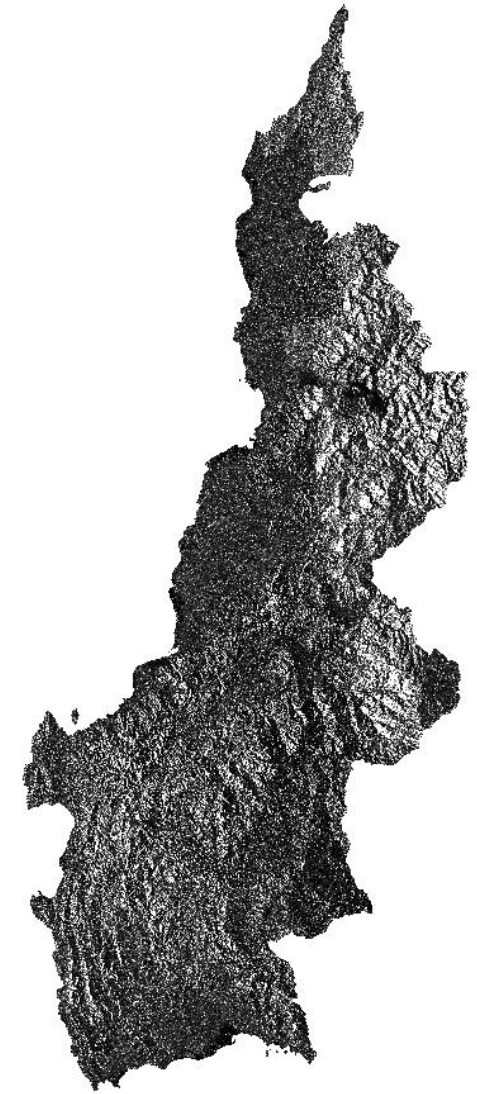
Digital services
strategy

Digital services as
a key growth
engine

Mosaic of
TerraSAR-X data



- 30 scenes of TSX/TDX data in 2017 for West Sulawesi Province.
- Processed using seamless mosaic method.





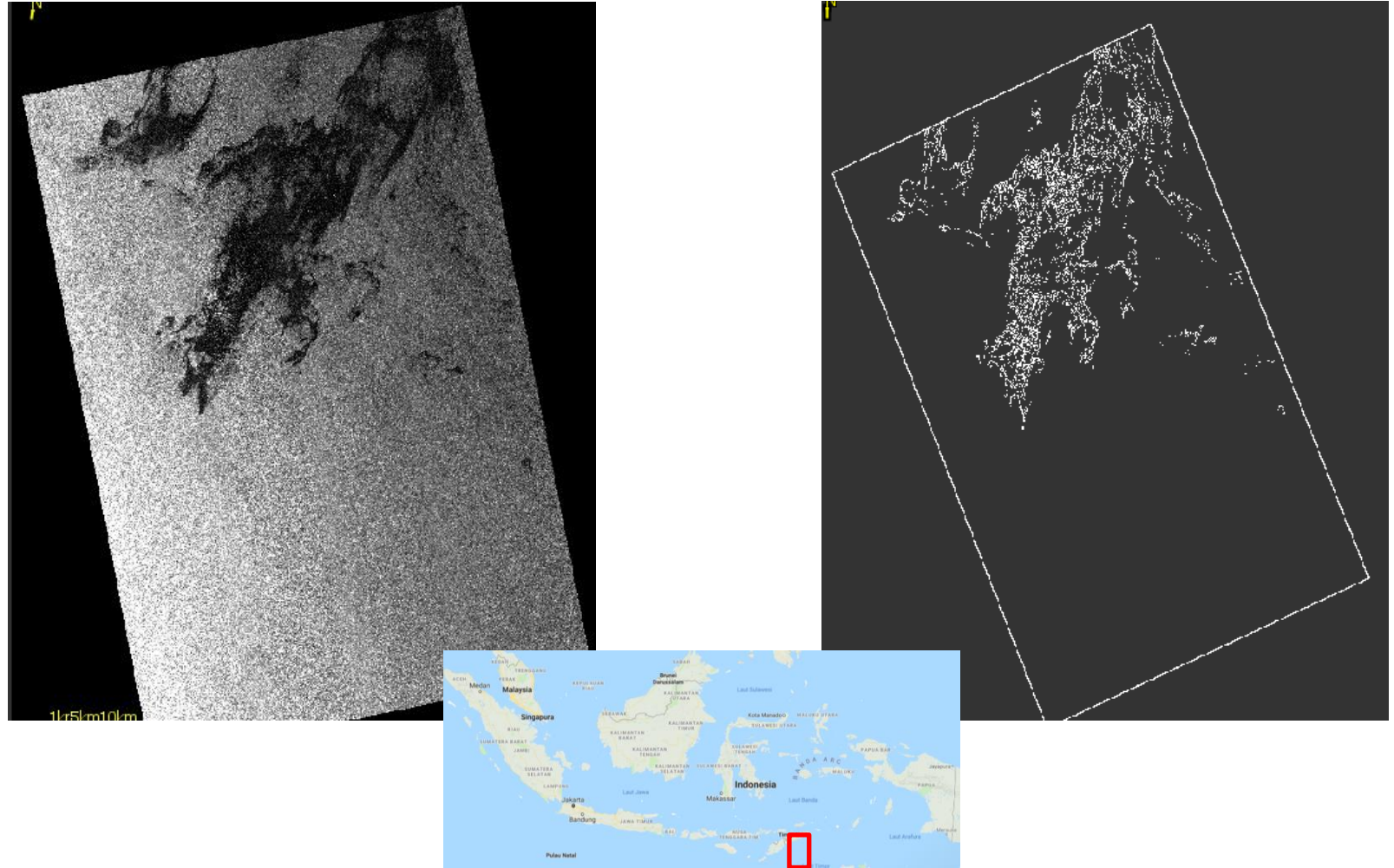
Challenges: Detecting illegal fishery
Tracking oil spills
Monitoring sustainable aquaculture

Digital services
strategy

Innovative
solutions

Oil spill detection

TerraSAR



- TSX data of 21 Sep 2009 (left) is used to detect oil spill in Timor Sea (right).
- Processed using dark spot detection with adaptive thresholding.

Digital Services



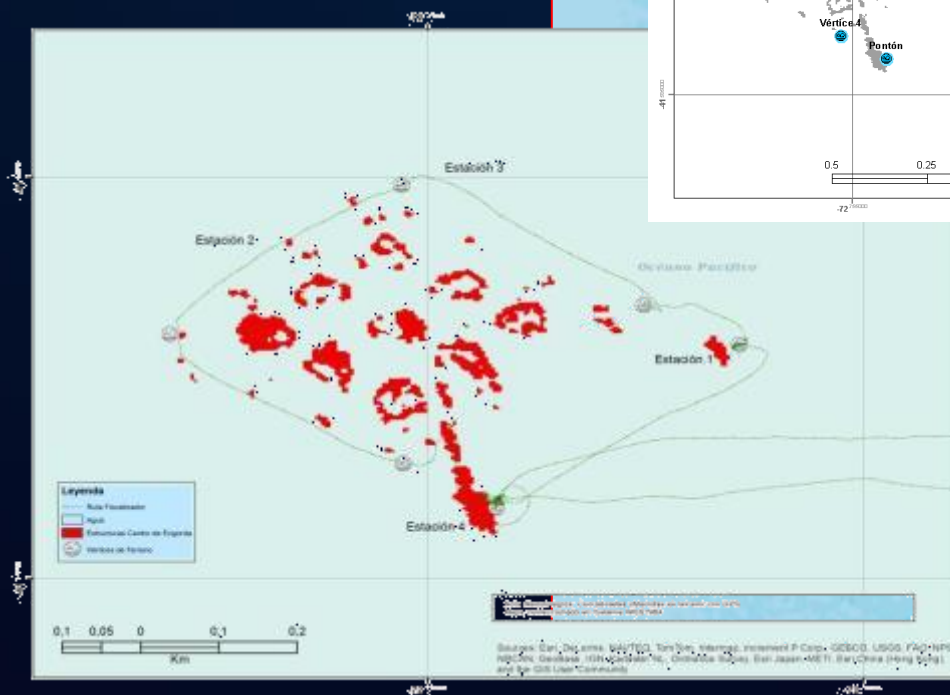
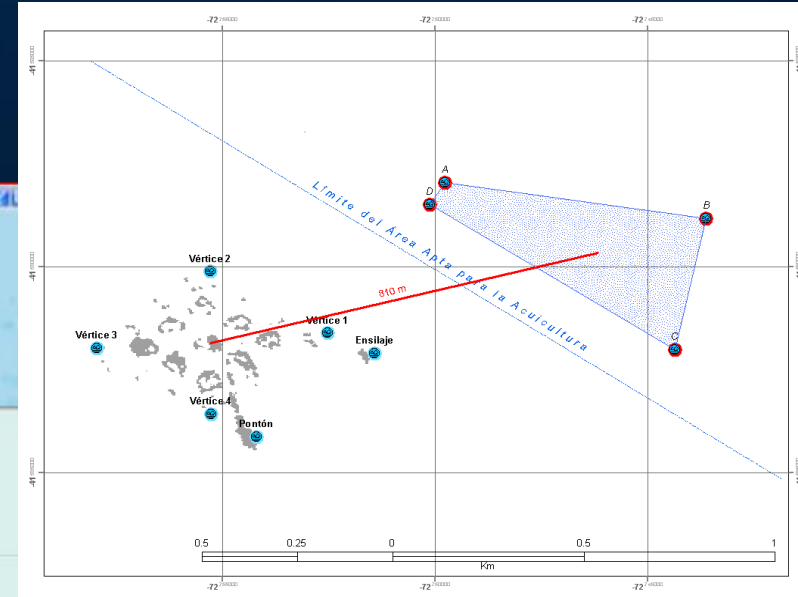
Innovative solutions



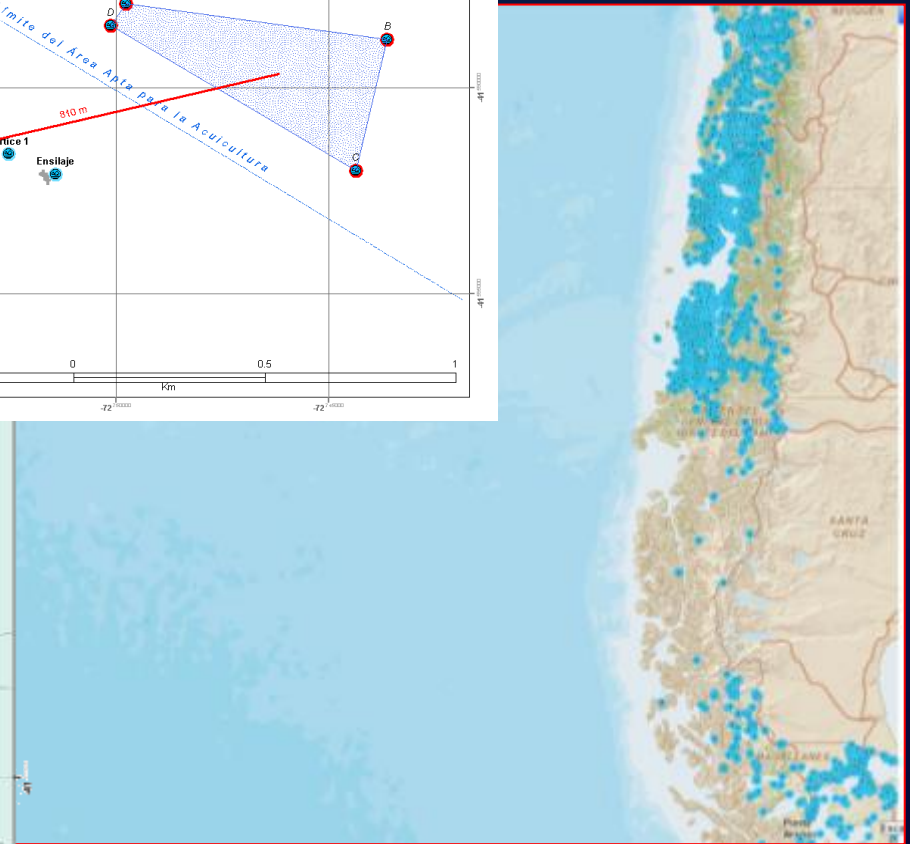
Aquaculture monitoring

TerraSAR

Courtesy: Superintendencia del Medio Ambiente, Gobierno de Chile



Chile

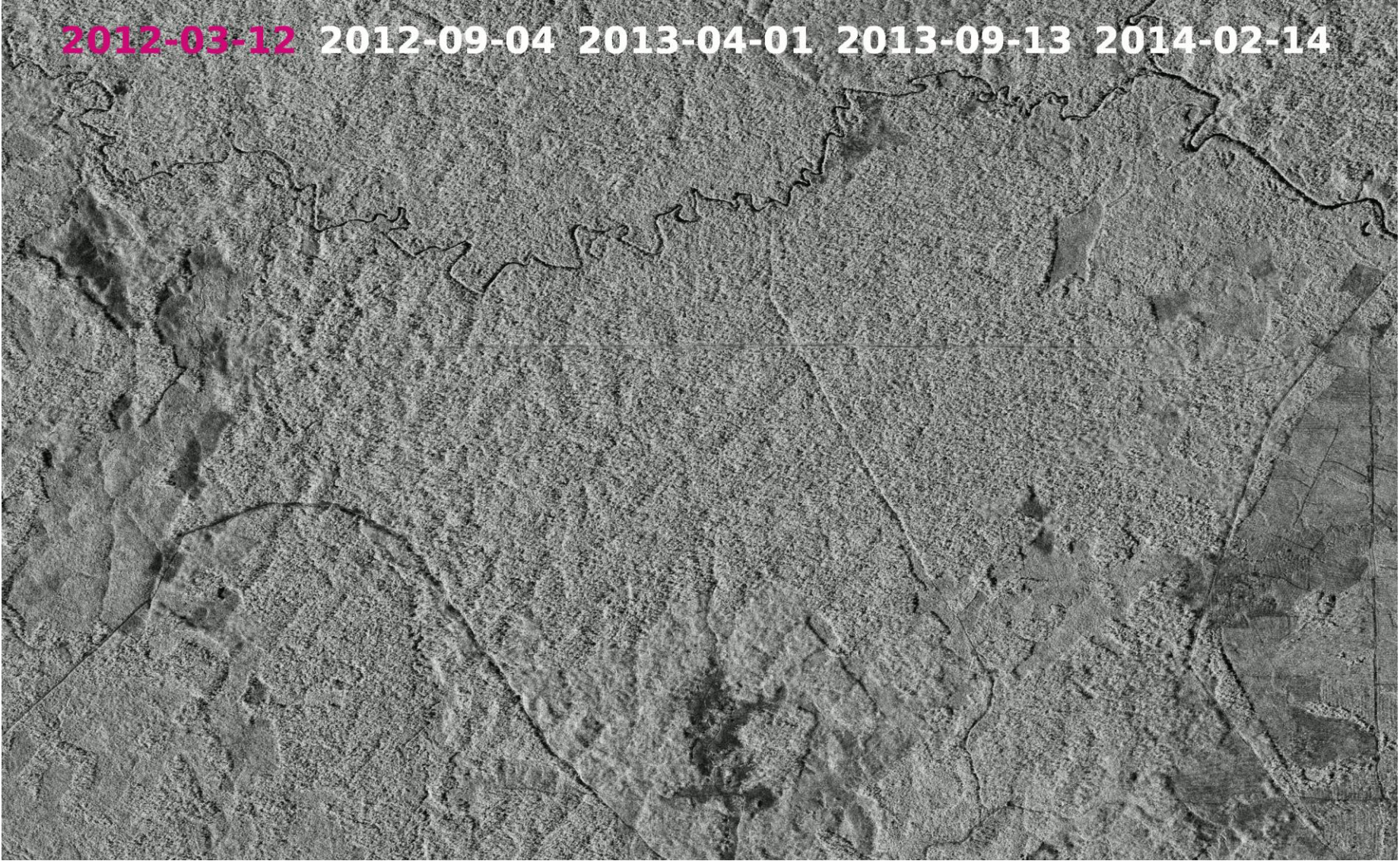


AIRBUS

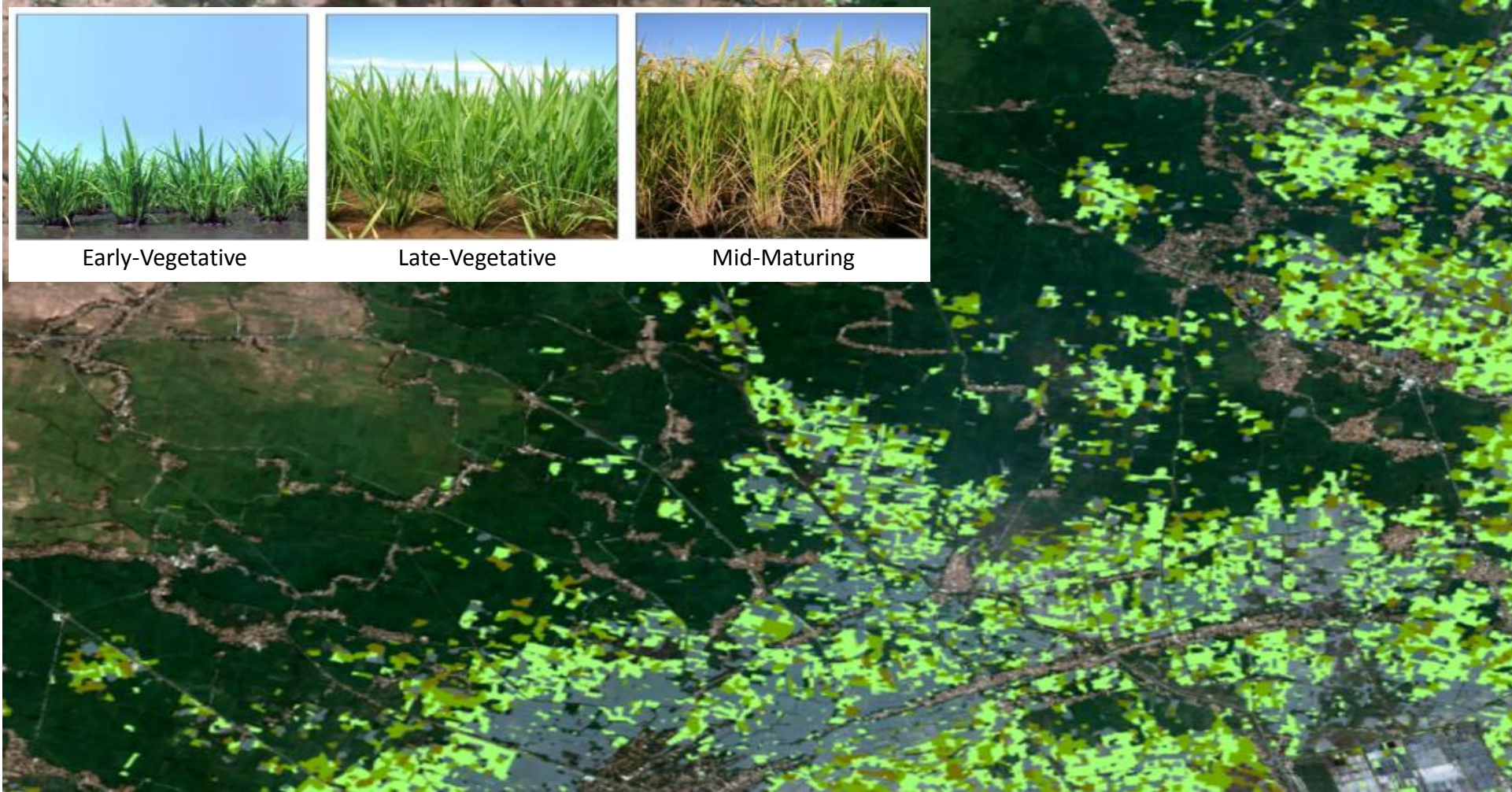


Challenges: Detection of deforestation
Crop monitoring in remote areas

Change detection:
Deforestation



Change detection: Rice crop monitoring



Legend

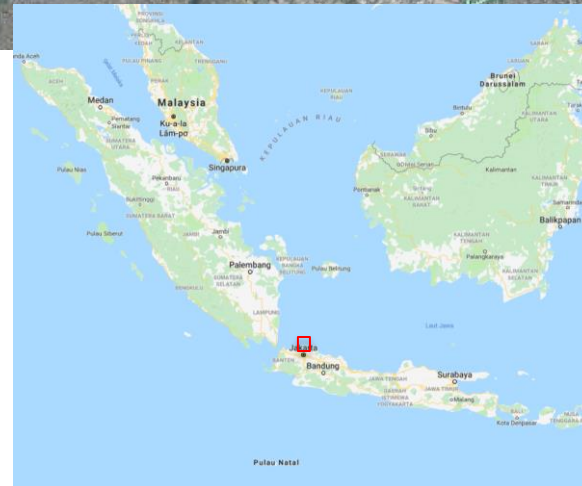
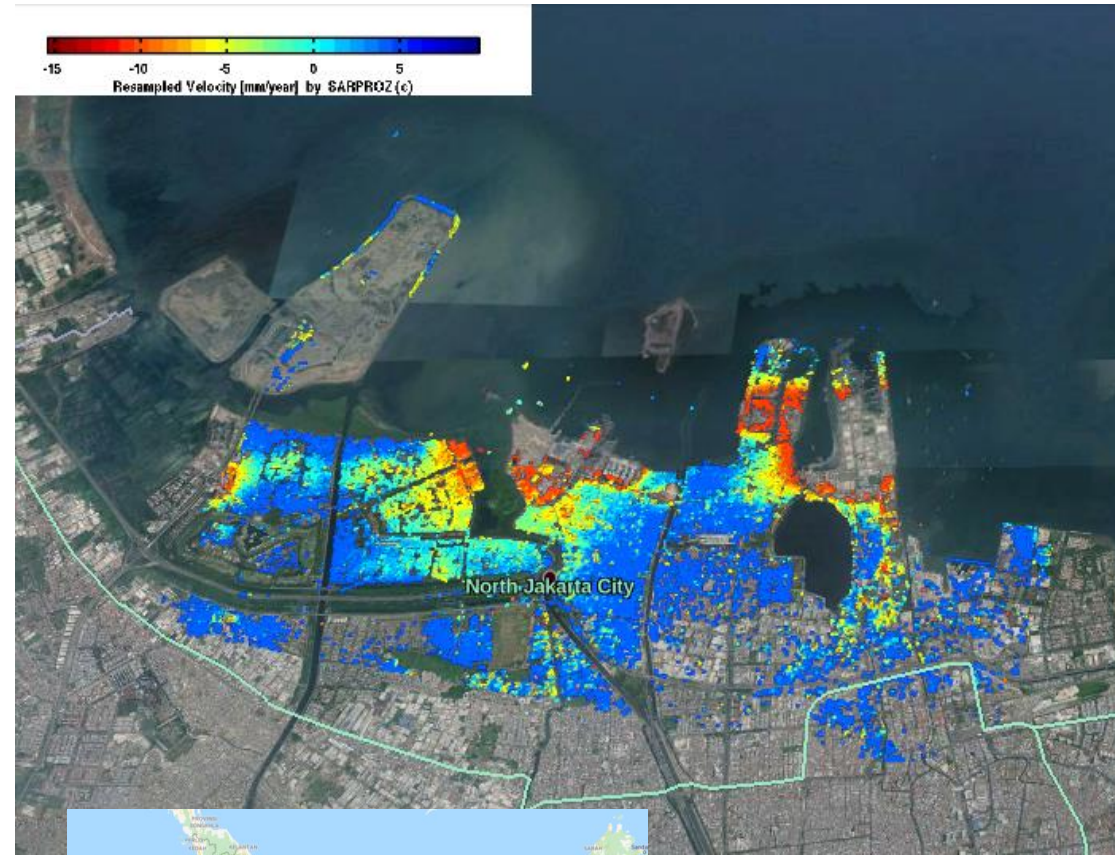
- Early-Vegetative_0320
- Early-Vegetative_0331
- Late-Vegetative_0320
- Late-Vegetative_0331
- Mid-Maturing_0320
- Mid-Maturing_0331



Challenge: Urbanization

Digital services strategy

Innovative solution for vertical markets



- TSX/TDX data from Aug 2017 – Oct 2018 (19 scenes) of North Jakarta area.
- Processed using Persistent Scattered Interferometry for land subsidence monitoring.
- Resampled velocity of North Jakarta is around -10 mm/year.
- Generated using SARPROZ software.



Challenges: Sea-level change
Flood prevention

Digital Services



Innovative solutions

Inundation simulation

WorldDEM
12 m posting
< 2 m rel. acc.



Villahermosa, Mexico



Villahermosa

Recommendation

- Capacity building on EO Data Cube as a new solution to store, organize, manage, and analyze EO data.
- Capacity building on standard methodologies for cloud computing SAR data and derived information.
- Innovation challenges in Forestry, Agriculture, Fishery, Marine, Mining, Urbanization, Disaster, etc.
- Strengthening international cooperation/partnership for knowledge, experience, and information transfer.
- Cost-efficient outsourcing to local industry, stimulating start-ups and growth of small and medium-size enterprises.

Thank you

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