→ EARTH OBSERVATION FOR SUSTAINABLE DEVELOPMENT

Disaster Risk Reduction

Understanding Risk West and Central Africa

Abidjan, 21 November 2019

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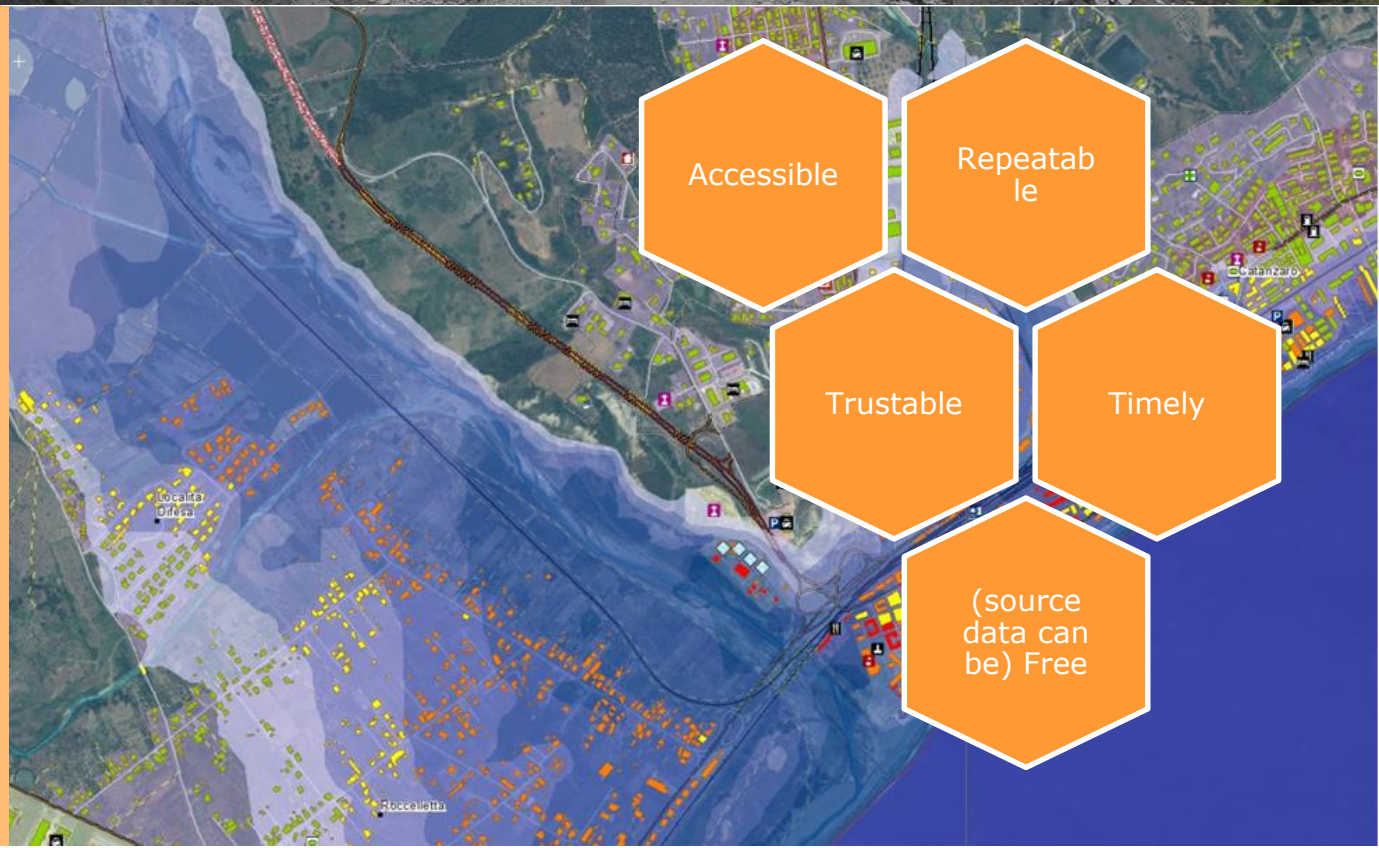
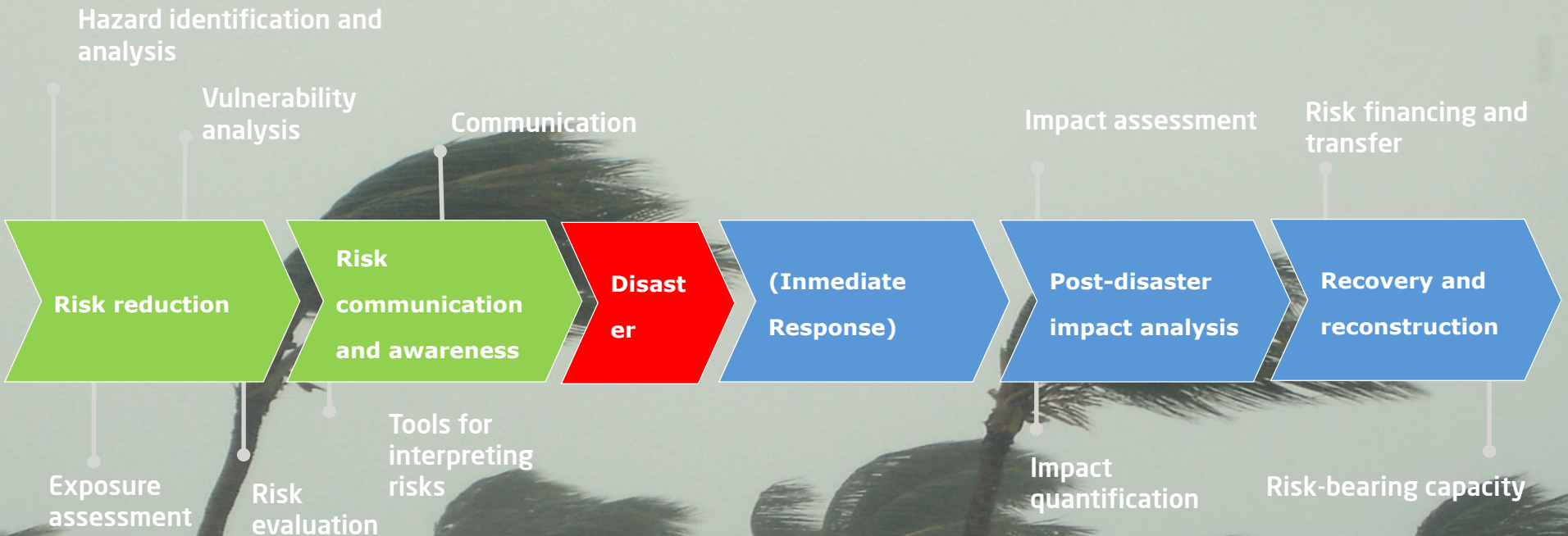
The value of Earth Observation

How **Earth Observation** can help?

Satellite-based data provides actionable information with some advantages over other methods

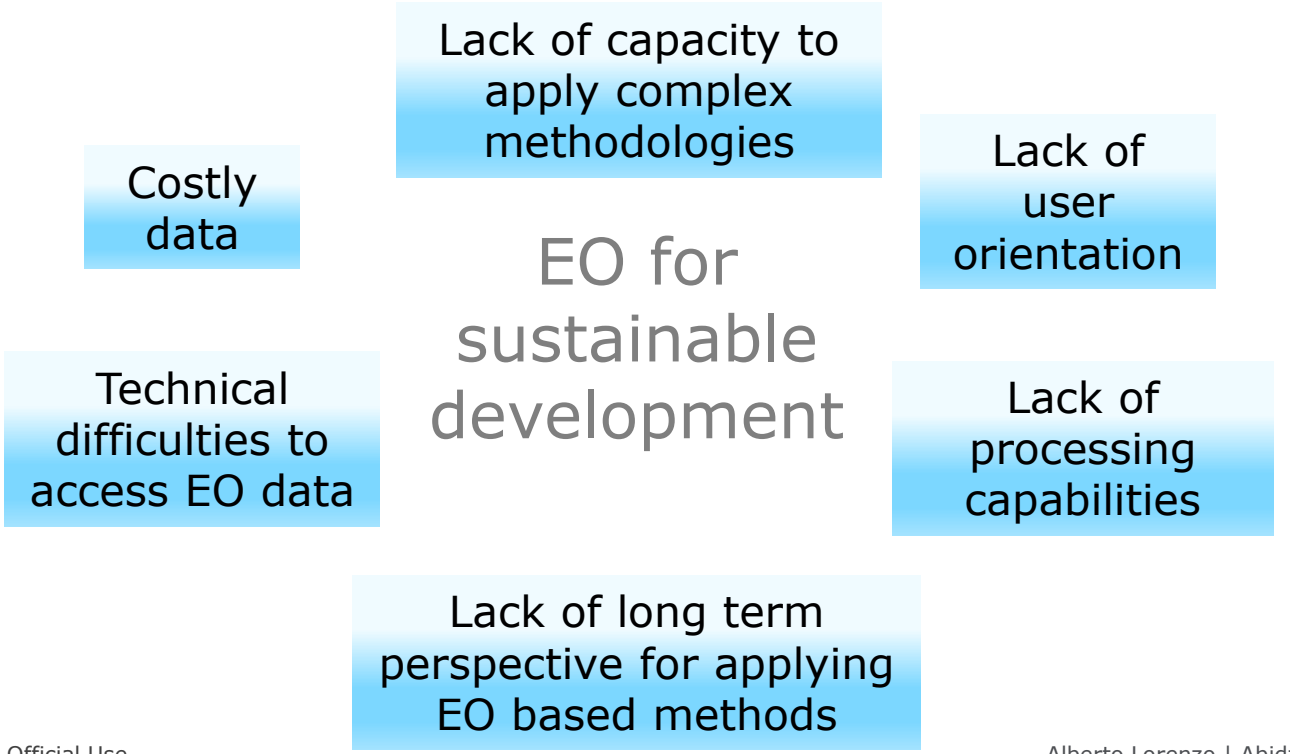


The cycle of service provision in EO4SD DRR



Satellite-based data provides actionable information in all phases of the DRM cycle

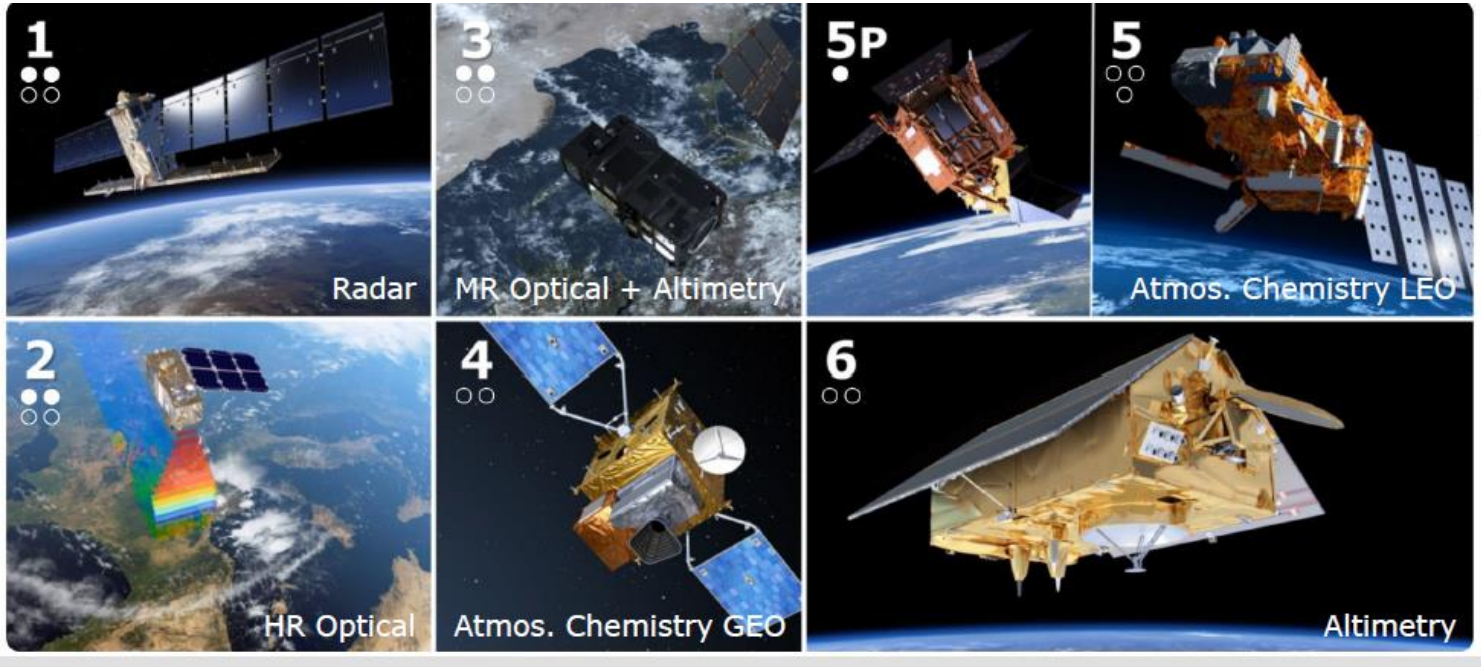
Typical obstacles for operational use of EO in DRR for sustainable development



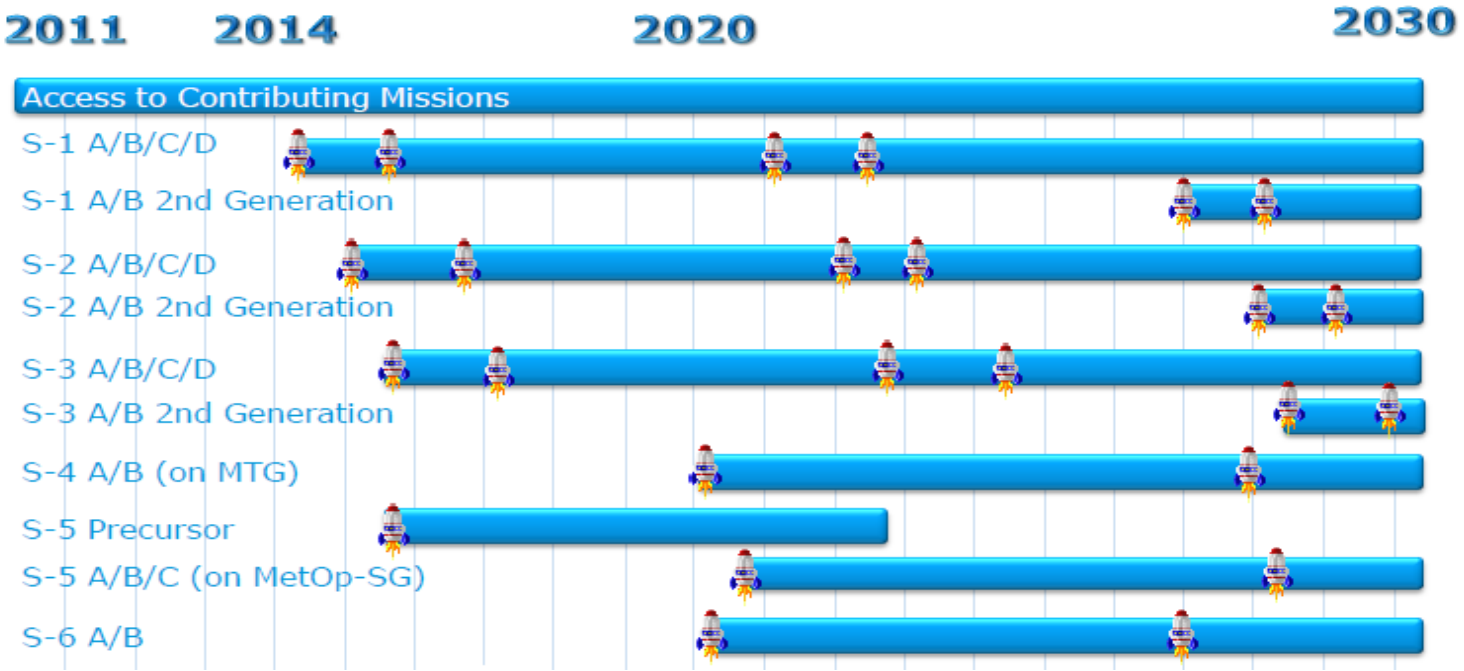
Satellite data in support to DRR

European Space Agency

Sentinel constellation: multipurpose



Sentinel constellation: Investing in EO ensures the data flow for decades



The data flow and the need of processing

Data is ensured

but it needs to be

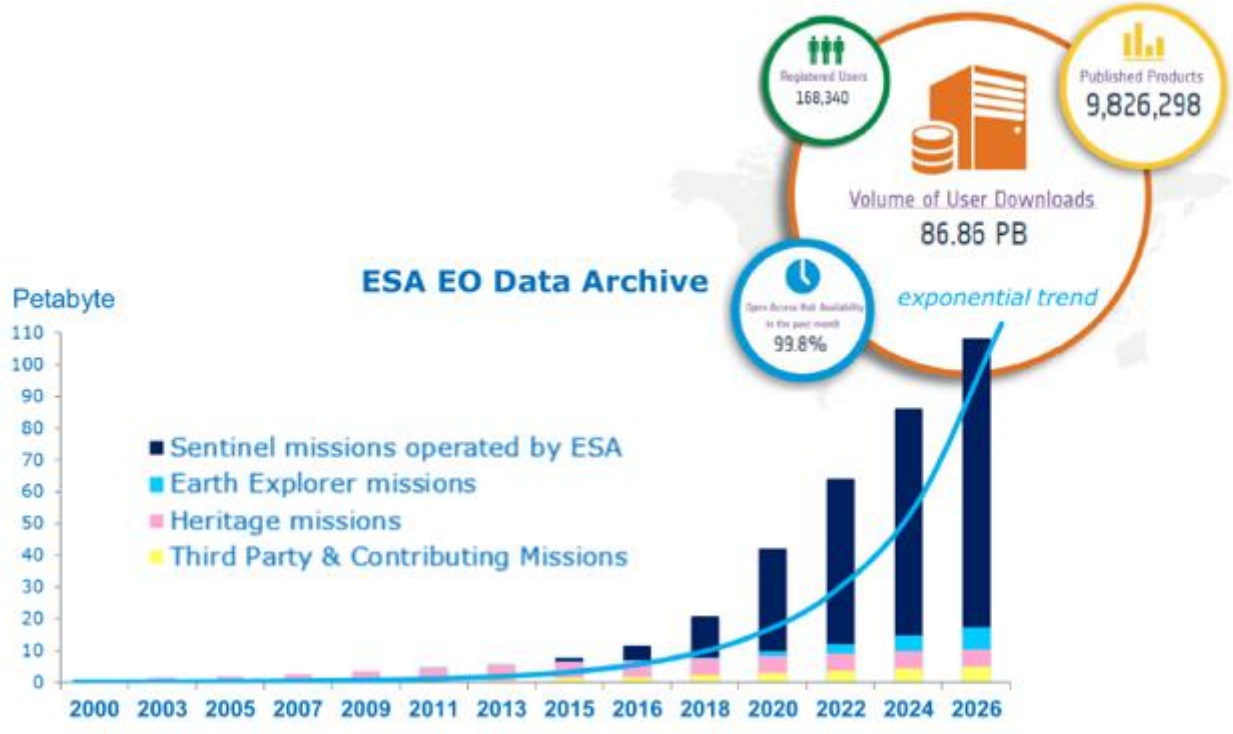
acceded

and

processed

to make it

usable



Bringing users to the data

- TEPs are an ESA originated **R&D activity on the EO ground segment** to demonstrate the benefit of new technologies for large scale processing of EO data
- TEPs are technology R&D, but fully user driven

Courtesy of Philippe Bally (ESA) and Michael Foumelis (BRGM)

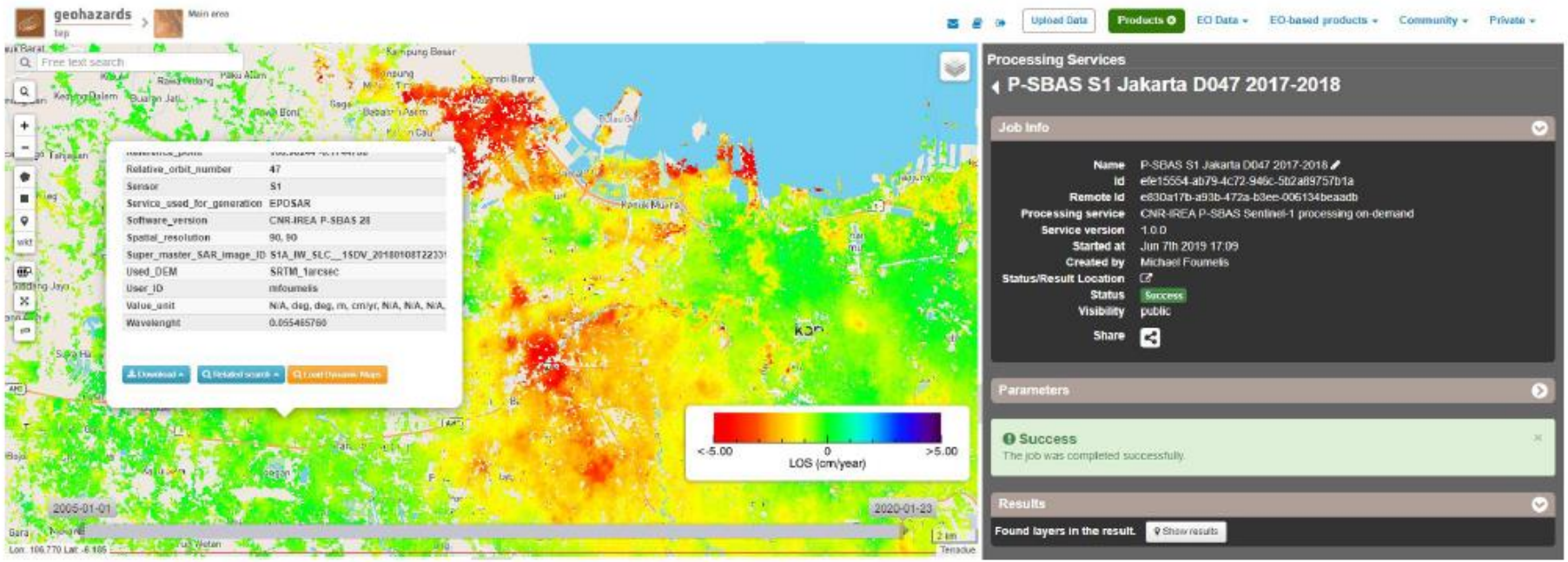
Bringing users to the data

geohazards tep

https://geohazards-tep.eo.esa.int

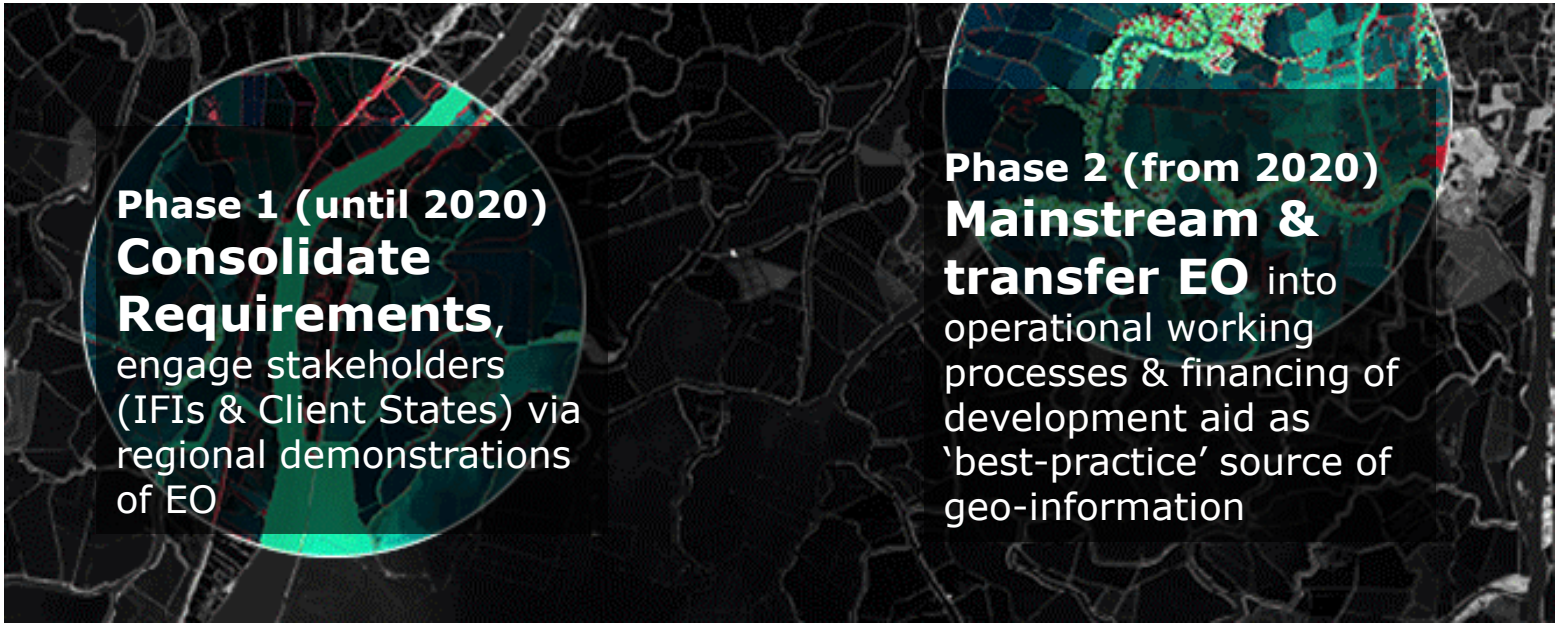
Definition:	*A platform with federated resources to access, process and publish satellite EO data and derived products*
Goal:	*Provide data access and a processing and e-collaboration environment to exploit EO data to assess geohazards and their impact*
Features:	*Tackles landslides, subsidence…* *Supports massive processing of EO data*
Benefit for West Africa:	*Low cost solution for early detection of subsidence issues and hot spot identification*

Example of terrain motion services in the GEP



Courtesy of Michael Foumelis BRGM

earth observation for sustainable development



- agriculture and rural development
- urban development
- water resources management
- eastern european region
- climate resilience
- disaster risk reduction
- marine resources
- fragility, conflict and security

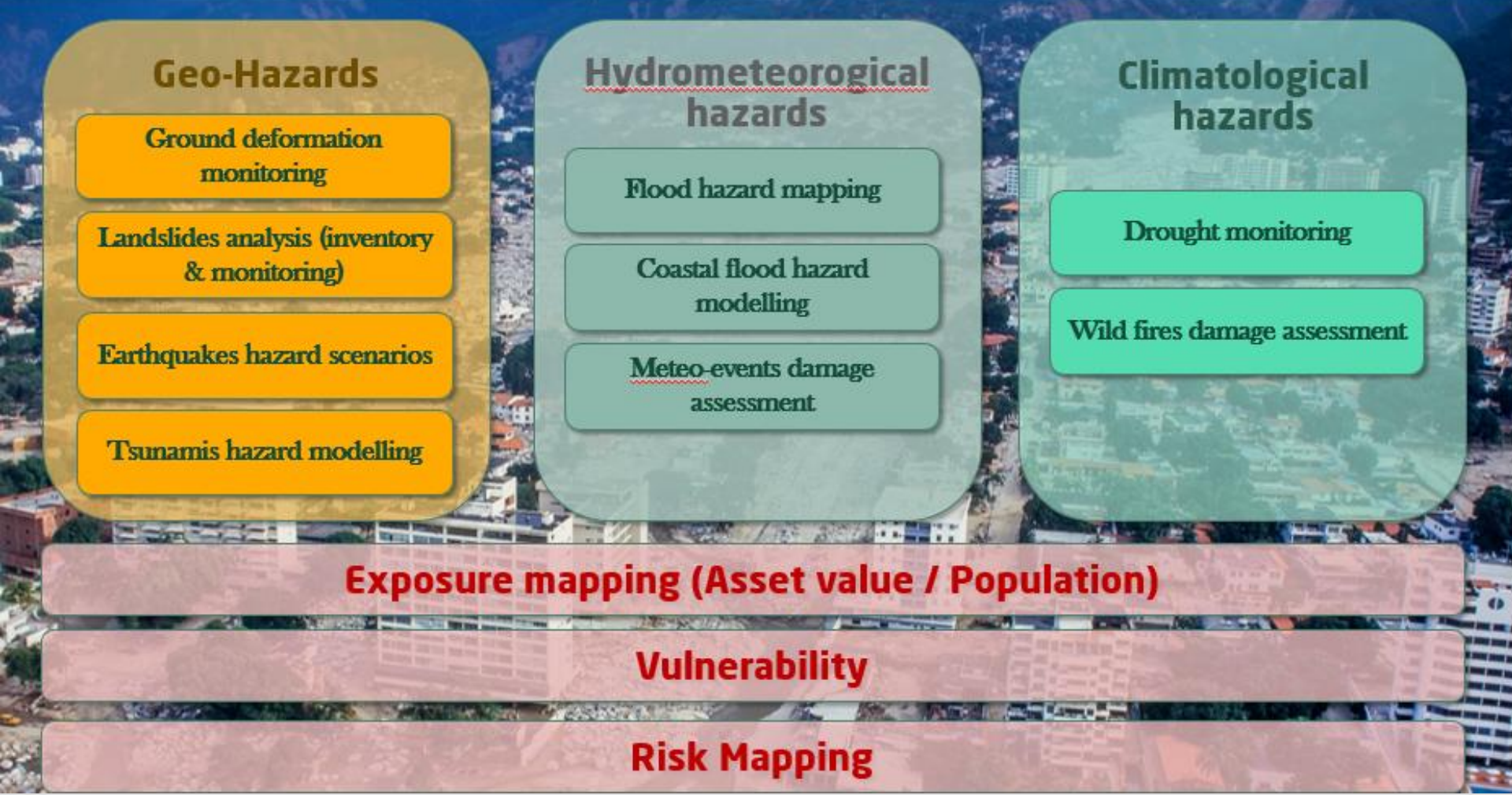

https://www.eo4sd-drr.eu/
→ EO4SD supports Central Sulawesi recovery
Earth Observation products to support Central Sulawesi recovery after earthquake and tsunami on September 2018.
Discover products in our web mapping application

- To promote the **use of space technology**
- To **strengthen cooperation** wit IFIS AND Local users
- To establish **long term relation**, based in demonstrating the value of EO
- To transfer technology and knowledge by **capacity building actions**
- Focused on **Disaster Risk Reduction**, not response

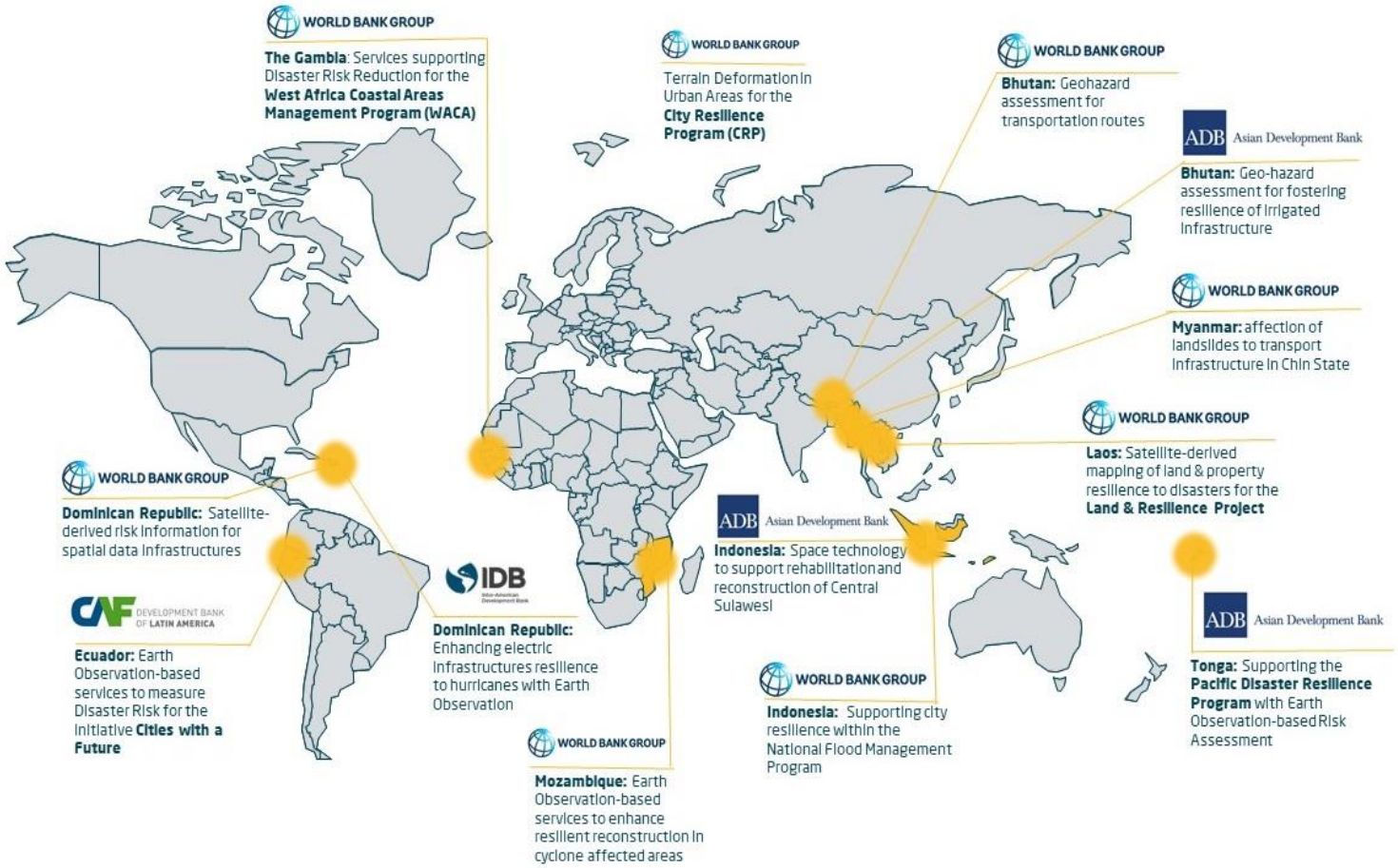
Expertise

Members	indra	gisat	planetek italia	ARGANS	ZAMG	Géosciences pour une Terre durable brgm
DRR Technical expertise	• Exposure mapping • Disaster risk assessment	• Terrain motion • Flood hazard • Landslides	• Terrain motion • Flood hazard	• Storm surge • Tsunami modelling	• Earthquake • Landslides	• Terrain motion • Landslides

Portfolio (next slide)


Geo-Hazards
Ground deformation monitoring
Landslides analysis (inventory & monitoring)
Earthquakes hazard scenarios
Tsunamis hazard modelling
Hydrometeorological hazards
Flood hazard mapping
Coastal flood hazard modelling
Meteo-events damage assessment
Climatological hazards
Drought monitoring
Wild fires damage assessment
Exposure mapping (Asset value / Population)
Vulnerability
Risk Mapping

EO4SD DRR pilots all over the world



indra
gisat
planetek italia
ARGANS
ZAMG
nazka
Géosciences pour une Terre durable brgm
OHB LUXSPACE

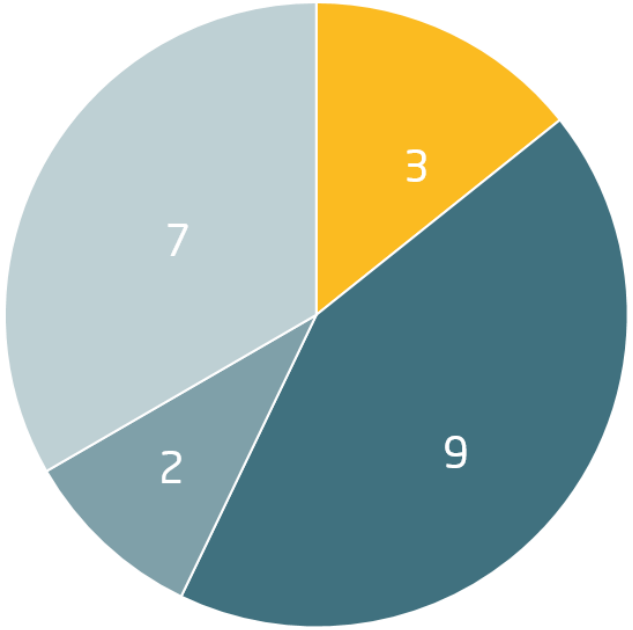
Kind of services proposed in the pilot demonstrations

Supporting services
- Reference Mapping

Hazard assessments
- Geohazards
- Hydrometeorological

Risk assessments
- Exposure mapping / Risk assessment

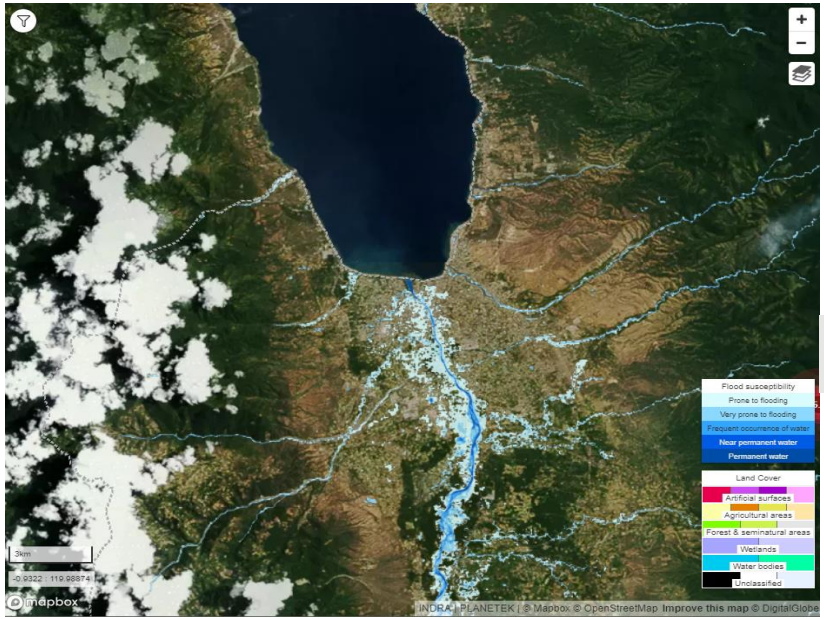
Reconstruction support
- Damage assessment
- Reconstruction monitoring



Success case: Support to reconstruction and recovery in Sulawesi (Indonesia)

Products to support reconstruction of Palu after earthquake and tsunami on 28th September 2018

(Project supported by ESA and carried out by Indra and their partners to Asian Development Bank)



→ In blue, flood prone areas in Palu (Central Sulawesi, Indonesia)

http://eo4sd.dev.nazkamapps.com/

Next success case? Disaster risk mapping and capacity building in The Gambia

Overview of the collaboration: Use satellite EO data and expert knowledge to better inform policy making for improving resilience”

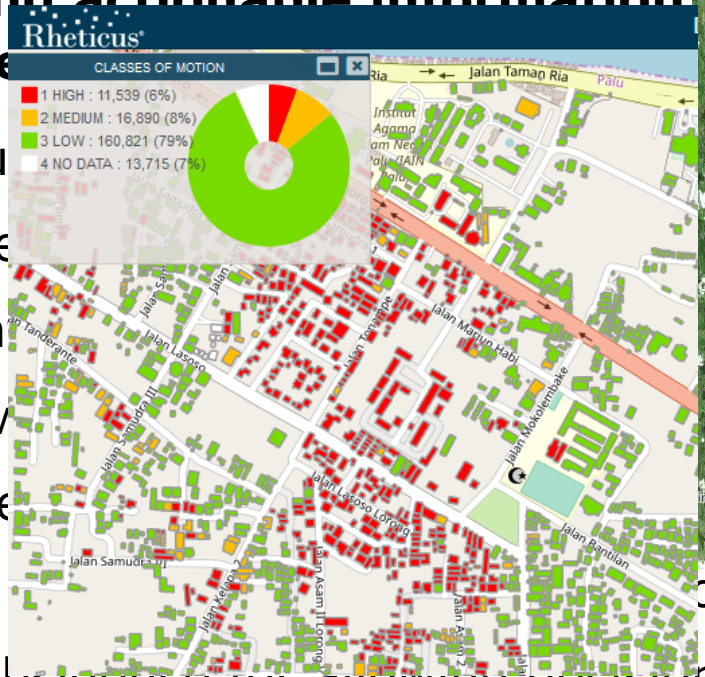
End-to-end solution for improving resilience

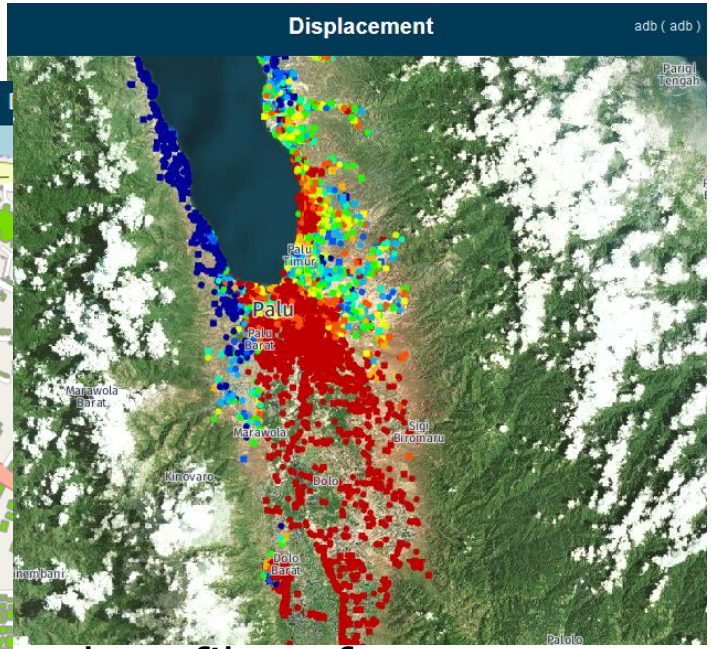
- EO4DRRSD Service 1 : Storm surge
- EO4SD DRR Service 2 : EO4SD DRR Subsidence
- EO4SD DRR Service 3 : Exposure mapping
- (External) Flood hazard mapping
- (External) Disaster risk assessment
- (External) Design of mitigation measures

EO data sources
- Sentinel 1
- Sentinel 2
- Cosmo SKYmed

1 Providing actionable information
Banjul are

- Bu
  me
- En
  lov
  are
- To
  subsidence for allowing decision taking

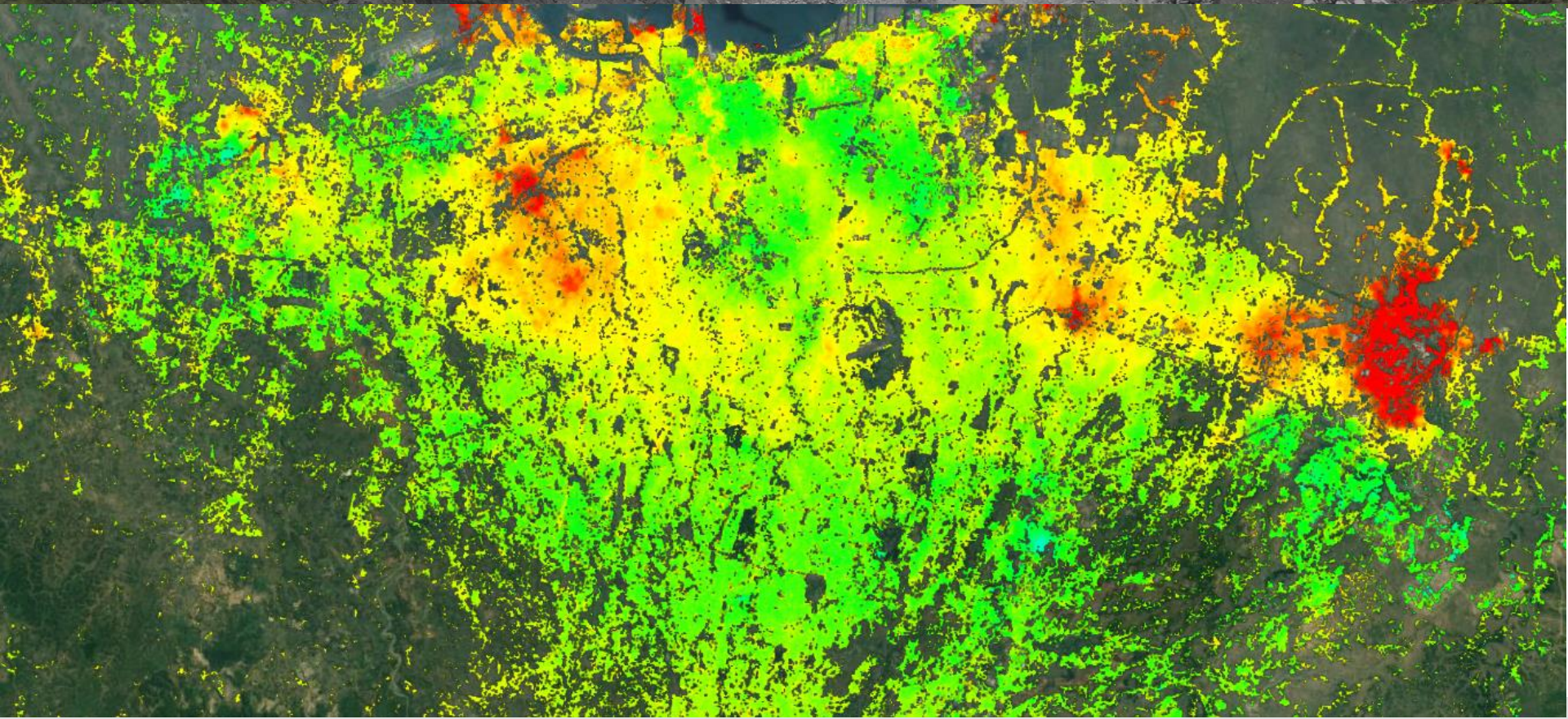




1 Providing actionable information on subsidence of Banjul area

- Building on previous works such comparing different methods for measuring subsidence in Banjul
- Entry point: To demonstrate the use of the GEP as a low cost solution for detection of hot spot subsiding areas. Method highly exportable
- To provide high precision temporal profiles of subsidence for allowing decision taking

Providing actionable information on subsidence of Banjul area (example of land subsidence product for Jakarta)



Hazards: Measuring terrain motion with milimetric precision

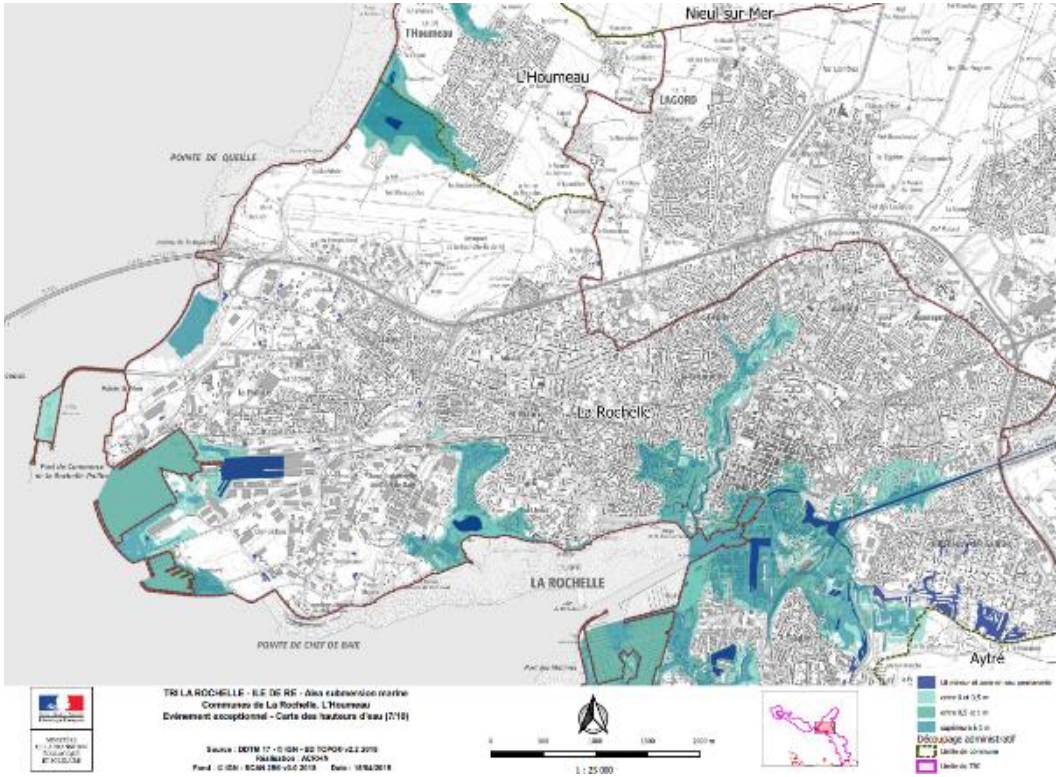
-15 0 +15
(mm/year)
20 m

Product obtained with Planetek's Rheticus

Hazards: Measuring building stability

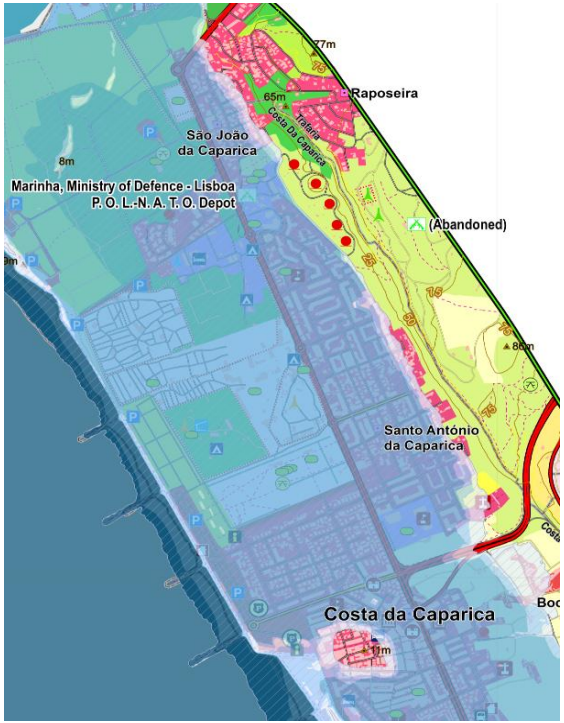
Product obtained with Planetek's Rheticus

- To provide storm surge mapping for different scenarios
- Entry point: To identify potential problems the would recommend further in-detail investigation



3 Exposure data with indication of urban expansion, construction typology and socio-economical vulnerability

- To provide EO-based data to identify exposed assets
- To provide a first approach on the vulnerability of the city in a multi-hazard context, especially the recently occupied areas and the poorest



The Gambia: To start the process of building capacity to the World Bank and local users

Example of collaboration with the Government of Indonesia

Lampiran 2

***International Training of Capacity Building of Earth Observation Products to Support the Enhanced Water Security Investment Project* (EWSIP) *and the Emergency Assistance for Rehabilitation and Reconstruction* (EARR)**
Jakarta, 17-21 Juni 2019

Aim:

To provide one week capacity building activity for a dive-in experience in the methodologies and results of the demonstration

EO impact

- Value of EO vs Traditional Methods
  - Cover large and remote areas at comparably low cost
  - Provides relevant information at reasonable cost
  - Enables users to exploit time series of data (monitoring, change detection)
  - Satellite data is sustainable, can be re-processed in the future

Earth Observation advantages over other methods

How
Earth Observation
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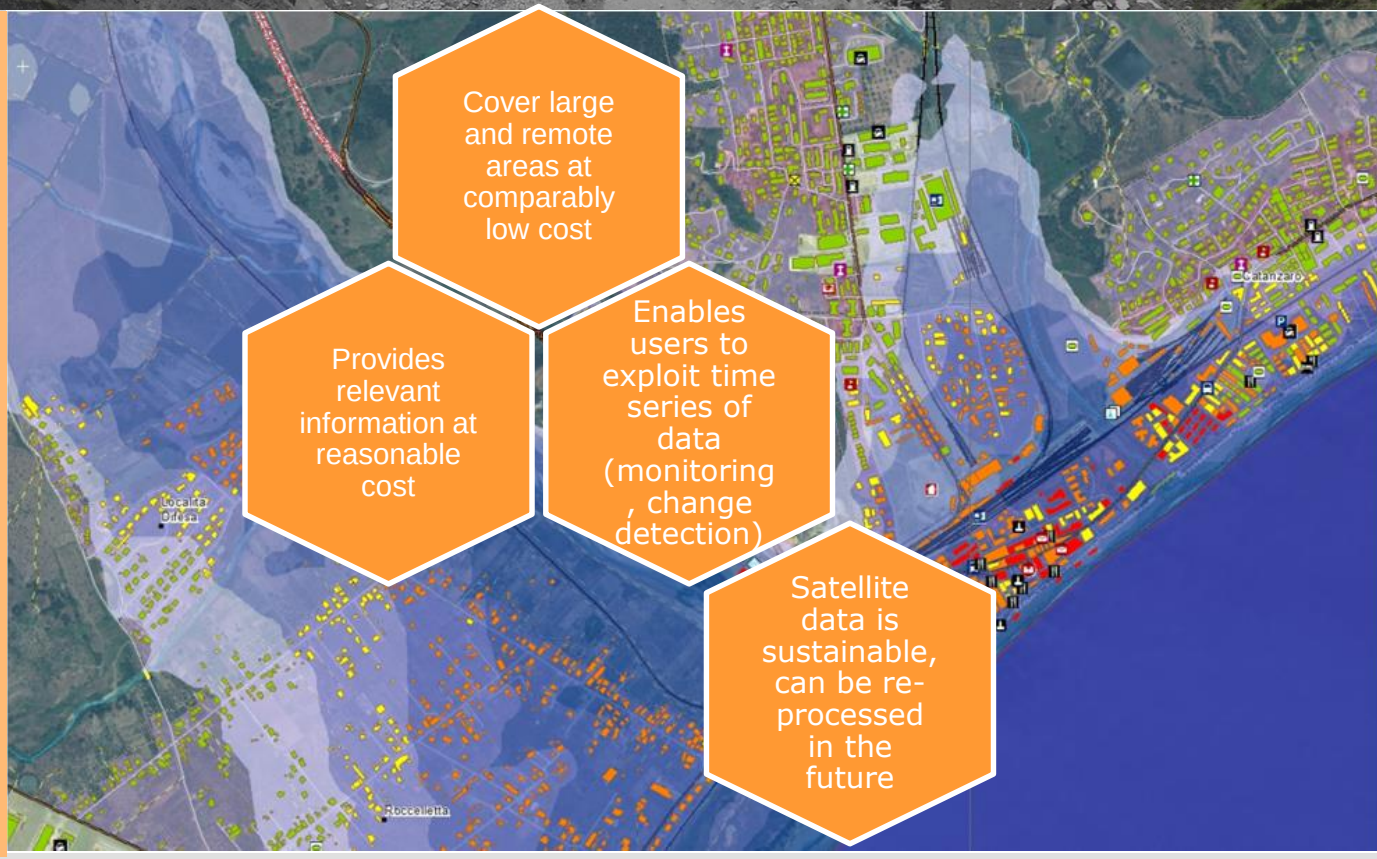
Satellite-based data provides actionable information with some **advantages over other methods**



Thank you!

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