→ ATLANTIC FROM SPACE WORKSHOP

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National Oceanography Centre
Southampton, UK

New paradigm for Climate Resilience programs over the Atlantic region

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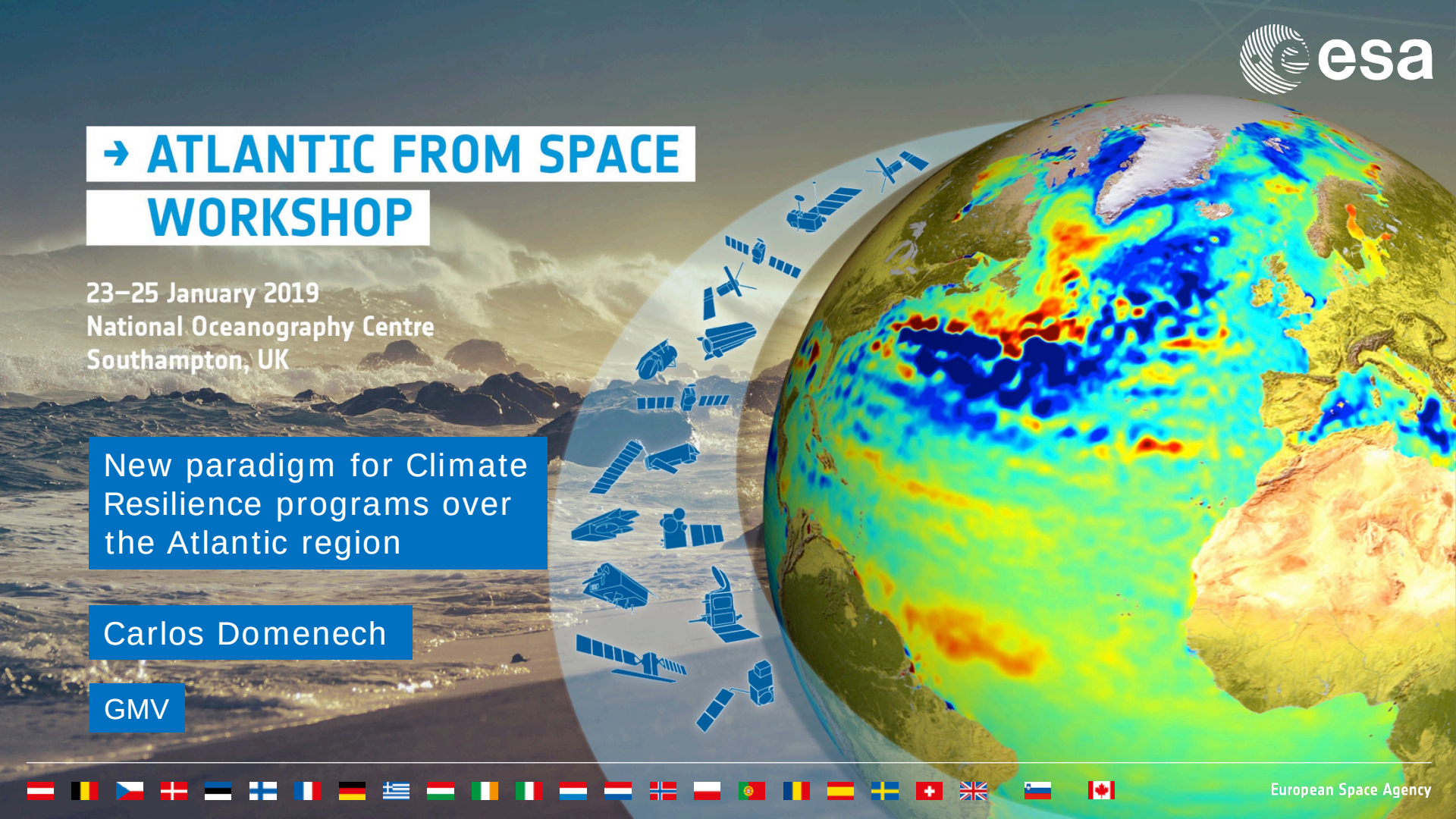
GMV



A GLOBAL TECHNOLOGY GROUP

Multinational technology group

Headquarters in Spain (Madrid)

Over 1,600 employees

Aeronautics, Space, Defense & Security, Cybersecurity, Intelligent Transport Systems, Healthcare, Banking & finances, and ICT industries.

Private capital

Subsidiaries in 10 countries

Roots tied to the Space and Defence industry

Engineering, development and integration of systems, software, hardware, specialized products and services

Founded in

1984

EO4SD CLIMATE

EO4SD-CLIMATE scope & objectives

EO4SD is an European Space Agency (ESA) initiative for the uptake of **Earth Observation-derived information in sustainable development**.

GMV leads the EO4SD **Climate Resilience cluster** aiming at providing answers on the potential of **Earth observation in supporting climate resilience and adaptation decision making** at regional and national level and in collaboration with **IFIs and their Client States**.

WORLD BANK

ADB ASIAN DEVELOPMENT BANK

IFAD INTERNATIONAL FUND FOR AGRICULTURAL DEVELOPMENT

BANQUE AFRICAINE DE DEVELOPPEMENT AFRICAN DEVELOPMENT BANK

IFC International Finance Corporation WORLD BANK GROUP

IDB Inter-American Development Bank

eo4sd.esa.int/climate

EO4SD-CLIMATE climate services

The project develops a series of **EO-based climate information services** in partnership with **stakeholders** (e.g. IFIs, NHMSs) to derive high-level data products supporting the monitoring and management of climate change risks

satellite EO data

model data

climate projections

→

Climate indicators

+

Socioeconomic indicators

Information about **actual climate risks** & **climate resilience building opportunities** – can be applied to e.g. index-based insurance, ecosystem-based adaptation, and many more…

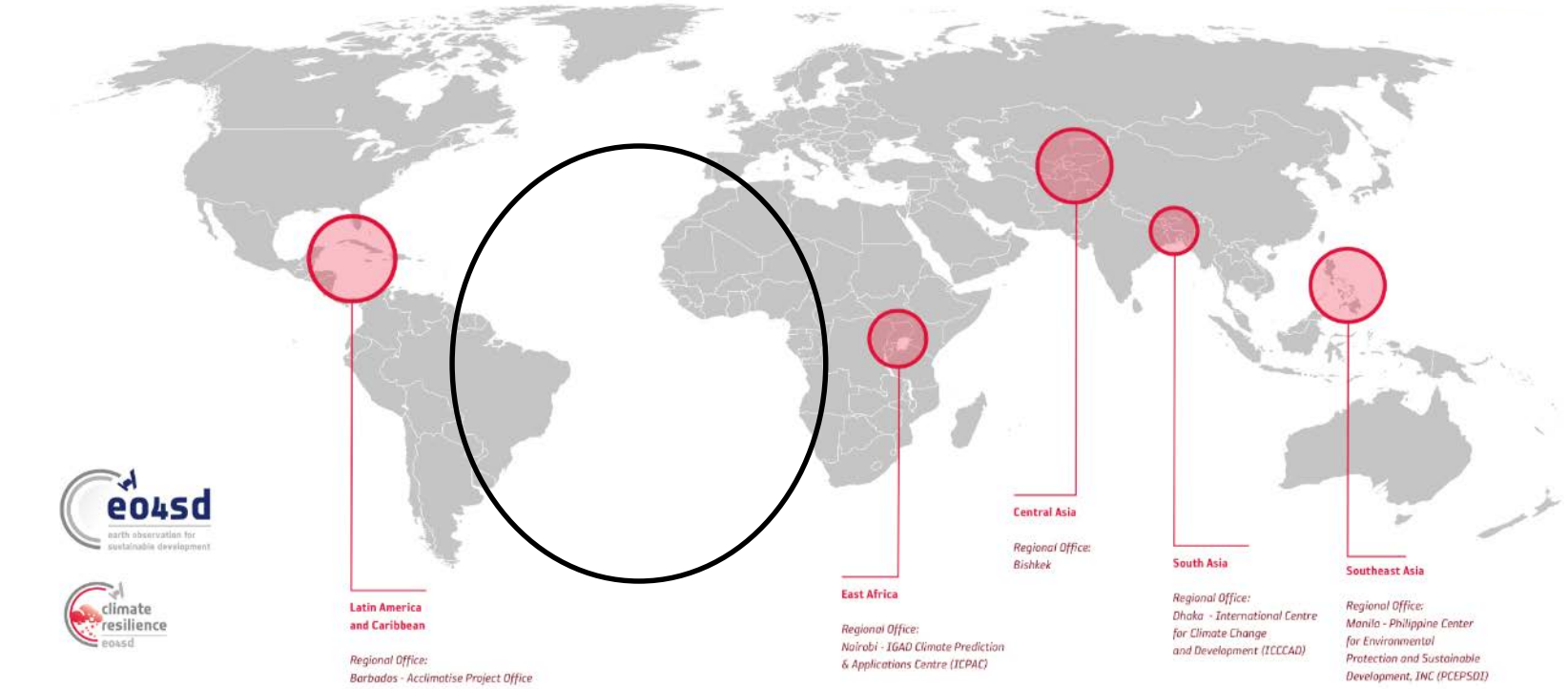
EO4SD-CLIMATE capacity building

- **Capacity building** to support operational institutional users.
- Enable the **sustainable and autonomous** application and use of the provided services and data.
- To be provided at two levels: to identified actors in CC (e.g. NHMSs) and to the IFIs to prepare them both for **long-term exploitation of EO-based services** addressing climate adaptation solutions.
- Provides the means to **autonomously conceive new services and products** customised to their needs.

EO4SD-CLIMATE 1st workshop

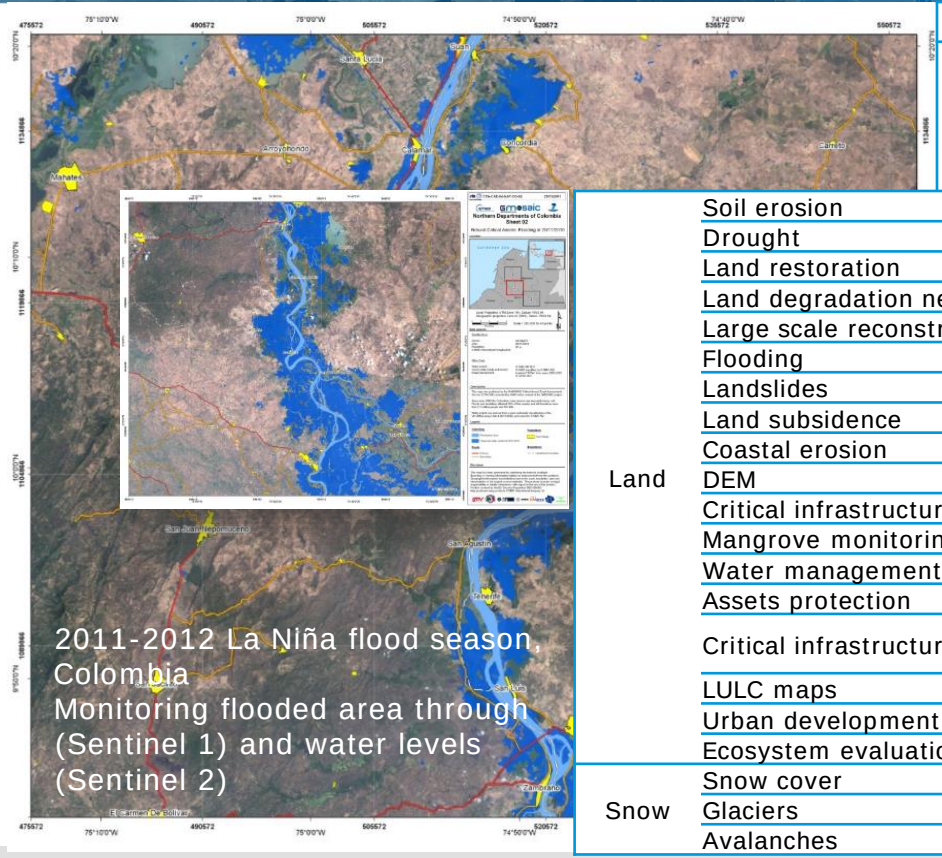
- Provide valuable insights into how IFIs and their client states can use EO to support climate-resilient development
- Discuss stakeholder needs and requirements
- Provide applicable and useful information about Copernicus data and services
- Showcase the proposed services of the EO4SD Climate Resilience cluster and how they can be used
- Training session about the EO4SD Climate Resilience platform, including downloading data, visualizing it, and creating of customized products

EO4SD-CLIMATE regions of interest



But IFIs engaged in the project manifested interest in a number of **countries** within **the Atlantic influence** (e.g. Angola, Brazil, Ghana, Liberia, Morocco, Nicaragua, Senegal, Togo)

Requested EO-based climate services



Sector	EO-based service required
Forestry	Forest degradation hotspots
	Forest type
	Deforestation
	Biomass and CO2 stocking
	Fire risk assessment
	Forest land cover change
ure	Crop land changes
	Irrigation
	Evapotranspiration
	Water scarcity monitoring
n	Vector borne diseases
	Urban heat islands
	CO2 sources
r	Eutrophication
	Water quality
	Runoff
	Surface water mapping
	Water balance modelling
	Groundwater level
	Wetland cover change
al	Sea level rise
	Salinity intrusion
	Coral reefs
	Bathymetry
	Benthic cover
	Coastal Erosion
Land	Soil erosion
	Drought
	Land restoration
	Land degradation neutrality
	Large scale reconstruction
	Flooding
	Landslides
	Land subsidence
	Coastal erosion
	DEM
	Critical infrastructure analysis
	Mangrove monitoring
	Water management
	Assets protection
	Critical infrastructure monitoring
	LULC maps
	Urban development
	Ecosystem evaluation
Snow	Snow cover
	Glaciers
	Avalanches

ATLANTIC RISKS RESPONSE & RESILIENCE

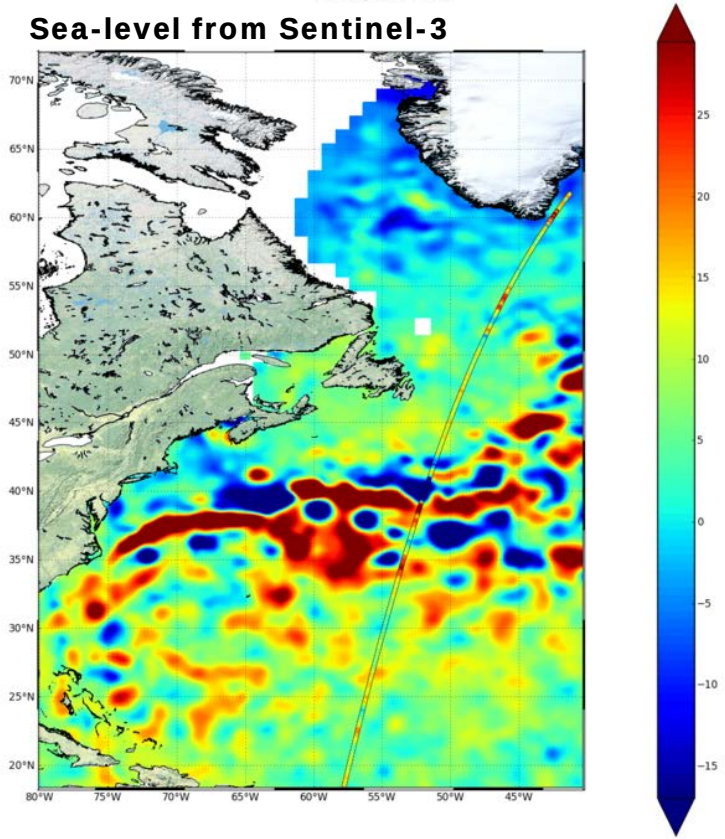
A3R scope & objectives

- GMV is currently setting up with **AIR Centre** a flagship activity to **mainstream EO**-based information **in the IFIs'** regional and global **programmes** and **initiatives over the Atlantic with focus on applications and services.**

- Directly linked to some of the AIR Centre's Societal Benefit Areas, in particular to "**Mitigation and Adaptation to Climate Change**" and extending it to also include **Disaster Risk Reduction** (e.g. landslides, subsidence, flash flooding, etc.).

- **Co-development and co-design** of **EO supporting services** (climate indicators and hazards monitoring) with the focus on an **user-driven approach** towards **self-sustainability** of operations.

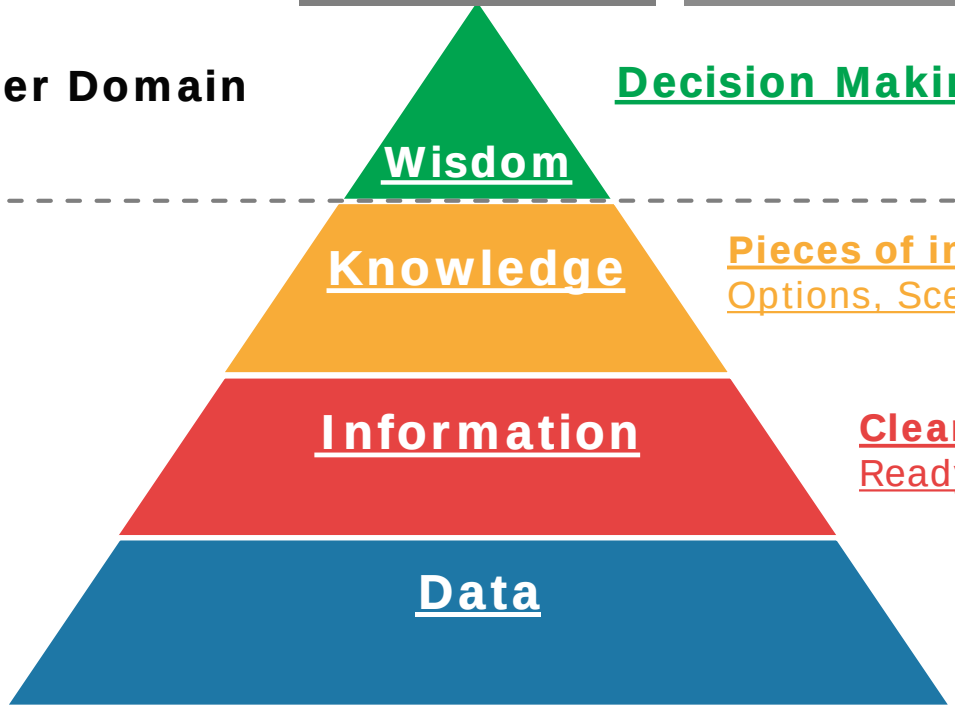
Sea-level from Sentinel-3



A3R user-driven approach

Stakeholders Public Sector, NMHS, Financial, Academia…

User Domain



Decision Making → KNOWLEDGE IN ACTION

Pieces of information connected to achieve a goal
Options, Scenarios, Assessments, Risks…

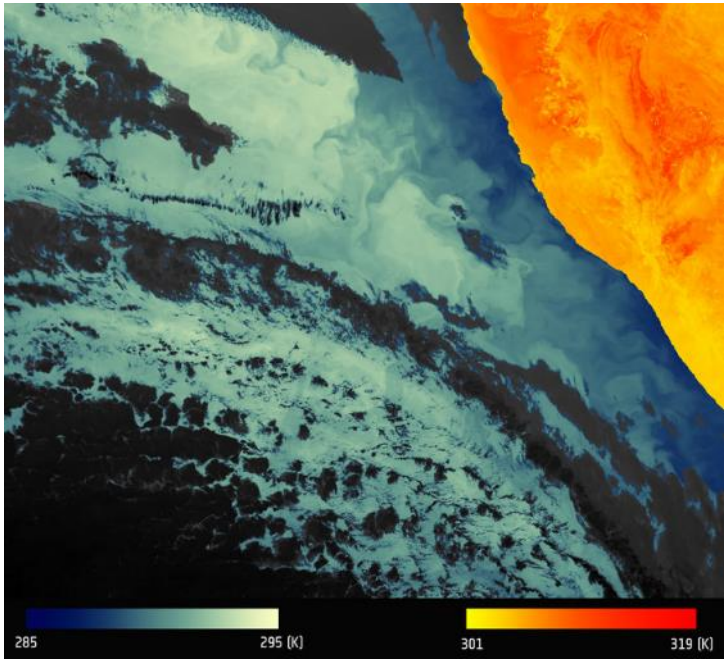
Clean, validated, documented data
Ready to use, analysis, fusion, semantic linkage…

Raw collection of facts
Satellite, DB, networks, crowd-sensed…

A3R goals

- Services based on **mature EO-based solutions.**
- Focus on **integration** from heterogeneous data sources (socio-economic, in-situ, modelled, etc.).
- **Exploiting existing services** provided by open-access EO data portals (Copernicus, ESA, NASA, EUMETSAT, etc.).
- **Involvement of IFIs** to access financing frameworks of projects and areas of interest for AIR Centre,
- Development of a **Climate and Disaster Risk Observatory** focused on research and concrete solutions for the Atlantic region:
  - Promotion of **state-of-the-art** solutions;
  - Improvement of associated **R&D agenda** on “Atlantic Interactions”;
  - Research **collaborations** within the AIR community and associated programmes/entities (e.g. COLAB, Copernicus services, etc.)

Surface temperature from Sentinel-3 in Namibian coastline



Service portfolio

Main activity:

Gathering of main interests and **needs** from Atlantic climate and DRR community

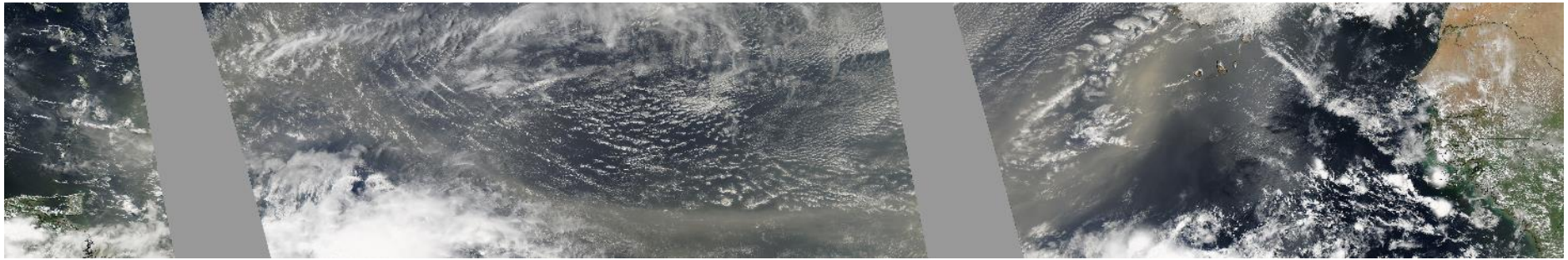
Preliminary service portfolio:

- Provision of global climate indicators
- **Hot spot identification and early warning system** (flash floods, coastal flooding, soil erosion, salinity intrusion, wildfire risk, coastal erosion**,** etc.)
- **Monitoring** of extreme events (droughts, heatwaves, floods, etc.)
- Monitoring of slow-onset events (desertification, glacial retreat, land degradation, biodiversity loss, etc.)
- **Sectoral climate services** (ecosystems, agriculture, forestry, energy, health, marine, coastal, etc.)
- Geo-hazards (subsidence, landslides, earthquakes, volcanoes, tsunamis, etc.)
- Hydro-meteorological hazards (flooding, storm surge, etc.)

Industrial contamination in Rio Doce (Brasil) observed by OLI Landsat 8

Key pillars

1. Prominent knowledge of the **EO downstream services** to end-users and a **network** of contacts at local, regional, national and international levels.
2. Well-proven and successful **capacity building plan** with insights in local heterogeneities (cultural, procedural, technical skills) to properly communicate the message. **Emphasizing co-design & co-development**.
3. Robust and **operationally ready technological solution from project KO.**
4. Elaboration of a **series of use cases** to demonstrate to the capacity building recipients the **benefits EO** brings for identification of **Climate Adaptation opportunities and Disaster Risk Reduction activities** (prevention, preparedness, recovery and reconstruction phases).



Plume of dust across the entire Atlantic Ocean obtained by Aqua MODIS

Key pillars (cont.)

- Provision of services and products responding to the users needs
- Market oriented
- Self-sustainable in time