New paradigm for Climate Resilience programs over the Atlantic region

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GMV
Who we are

A GLOBAL TECHNOLOGY GROUP

- Multinational technology group
- Headquarters in Spain (Madrid)
- Over 1,600 employees
- 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.

eo4sd.esa.int/climate
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.

**EO4SD-CLIMATE climate services**

- 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...
- **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.
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 customized products
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: Forestry
- Forest degradation hotspots
- Forest type
- Deforestation
- Biomass and CO2 stocking
- Fire risk assessment
- Forest land cover change

#### Sector: 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 cover
- Glaciers
- Snow avalanches
- Coastal erosion

#### Sector: Coastal
- Sea level rise
- Salinity intrusion
- Coral reefs
- Bathymetry
- Benthic cover
- Coastal Erosion
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.
A3R user-driven approach

Data

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

Information

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

Knowledge

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

Wisdom

Decision Making → KNOWLEDGE IN ACTION

Stakeholders

Public Sector, NMHS, Financial, Academia...

User Domain
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.)

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

credit: NASA
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