# UN Early Warning for All initiative (EW4ALL) – identified gaps

Presented to CGMS-53 Plenary session, agenda item 2

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## Executive summary of the WP

- EW4All is a UN-wide initiative to ensure that every person on earth will be protected by early warning systems, to reduce the impacts to life and property from natural hazards. The changing climate and intensification of severe events add special urgency to tackle this challenge and build climate resilience.
- 30 countries were identified as the first priority – mostly in tropical regions. 4 UN agencies were chosen to lead the effort: UNDRR – disaster risk knowledge and management, WMO - detection, observation, monitoring, analysis, forecasting, ITU – warning dissemination and communications, IFRC – preparedness and response.
- WMO`s EW4All efforts are on two parallel complementing tracks: Enhancing the global infrastructure: Improvement of international data exchange; more and better products available worldwide; better guidance and training to the members – the main theme of the WMO`s technical commissions. Technical Support to Regional and/or National interventions: Establishing regional support systems; targeted investments for closing national gaps – the main themes of WMO`s extrabudgetary projects, such as SOFF, CREWS etc.
- WMO rapidly analysed the existing gaps in most of the priority countries, including status of use of satellite products. Priority hazards were identified. The WMO`s technical commissions adopted action plan focused around these gaps and hazards.
- Several activities are ongoing to improve the capacity of the members in WMO regions related to data dissemination, data processing, data visualization and training.

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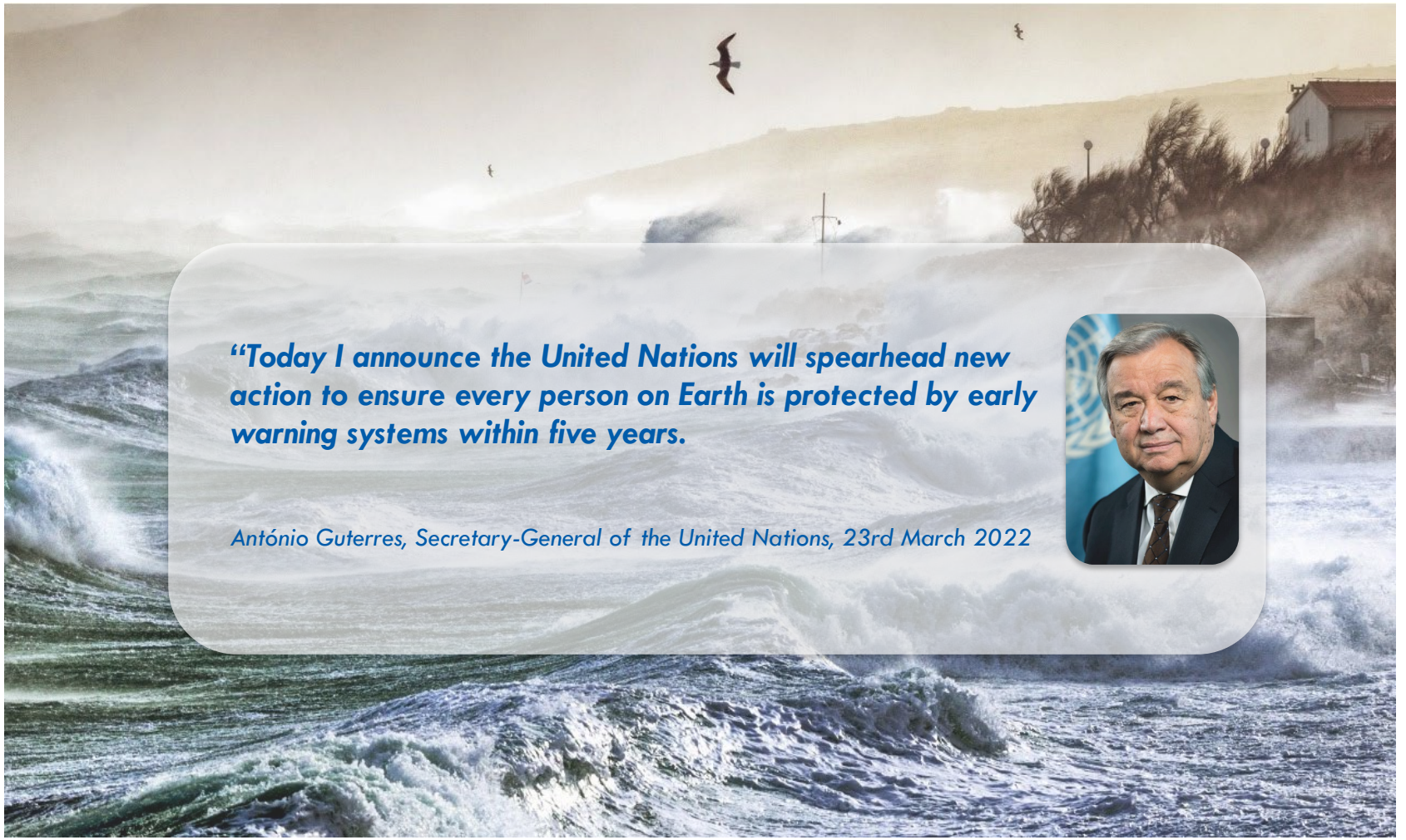
Early Warnings for All

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# The initiative is built on four pillars

UNDRR

**Disaster risk knowledge and management** (led by UNDRR)
Ensuring all countries have access to reliable, understandable and relevant risk information, science and expertise

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**Detection, observation, monitoring, analysis, forecasting** (led by WMO)
Ensuring all countries have robust forecast and monitoring systems, enabling policies to support optimization and sustainability of hazard monitoring and early warning systems

ITU

**Warning dissemination and communication** (led by ITU)
Using a people-centered approach to ensure that early warnings are effectively and timely disseminated to reach everyone, especially those most at risk

IFRC

**Preparedness and response capabilities** (led by IFRC)
Ensuring local governments, communities and individuals at risk have the knowledge and means to take pre-emptive early actions to prepare for and respond to incoming disasters upon receiving warnings

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Early Warnings for All

# Initial Roll-Out Countries

# WMO`s EW4All efforts are on two parallel complementing tracks:

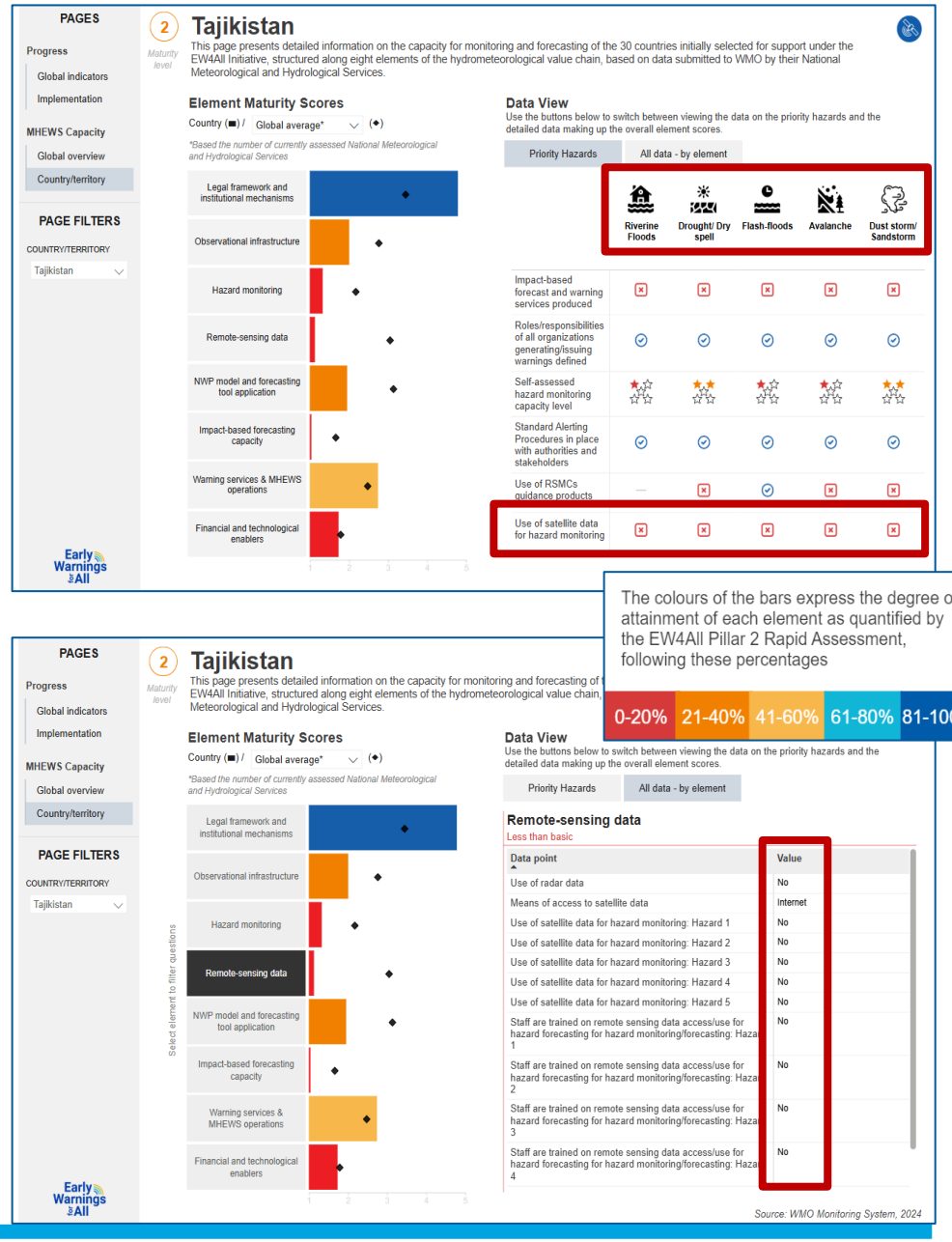
- **Enhancing the global infrastructure:** Improvement of international data exchange; more and better products available world wide; better guidance and training to the members – the main theme of the WMO`s technical commissions
- **Technical Support to Regional and/or National interventions**: Establishing regional support systems; targeted investments for closing national gaps – the main themes of WMO`s extrabudgetary projects, such as SOFF, CREWS etc.

# Early Warnings for All Dashboard

## Early Warnings for All Dashboard (wmo.int)

Rapid Assessment: **58 WMO Members assessed:**

- **84%** of Members assessed make use of satellite data for monitoring **at least one** priority hazards
- **Only 57%** have received training in the use of satellite data for monitoring **at least one** priority hazard
- **45%** utilize satellite data for monitoring **three or more** priority hazards
- **74%** accessing satellite data **through a dedicated reception station**

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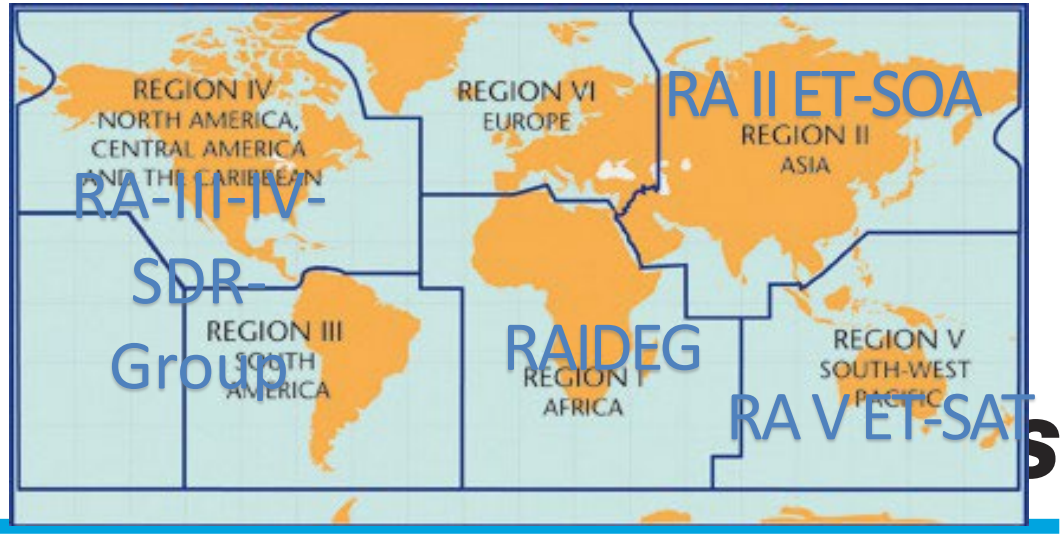
# Work Plan to address gaps in satellite data & products in support of EW4ALL

| No. | Deliverable | Delivered to (body, e.g. INFCOM-3) | Body responsible (Team, Secretariat, etc.) | Consultation with, support from (Secretariat, etc.) | Effort type (meetings, workshops, consultancy, secretariat) | Estimated timeline |
|---|---|---|---|---|---|---|
| 1 | **Preparation of the mapping exercise** on the utilization of satellite data for priority hazards | | Regional Associations (e.g. Regional Coordination Groups on Satellite Data Requirements) | Secretariat (Regional offices, Space Systems and Utilization Division), with the guidance from ET-SSU | Virtual meetings, email exchange, Secretariat work | July 2024 |
| 2 | **Conduct the mapping exercise** among Members | | Regional Associations | Secretariat (Regional offices) | Dynamic mapping exercise | September 2024 |
| 3 | **Identity the initial (regional) list of satellite products for each priority hazards** based on: (1) results of mapping exercise above and (2) results of **data call on EW4ALL** provided by satellite providers | | More experienced users in each region (particularly the leads of satellite data requirements groups and VLab members) | Secretariat (Regional offices, Space Systems and Utilization Division), with the guidance from ET-SSU | Virtual meetings, email exchange, Secretariat work | November 2024 |
| 4 | **Validate the list of products with satellite providers** to include any additional products that users may not be aware of, as well as with Members in each region | INFCOM MG & Regional Associations MG via Regional Coordination Groups on Satellite Data Requirements | Satellite providers and WMO Members | Secretariat (Regional offices, Space Systems and Utilization Division), with the guidance from ET-SSU | | December 2024 – February 2025 |
| 5 | **Gap analyses** in terms of **access to satellite data**, **training** on processing, visualization, and use of satellite data and products | INFCOM MG & Regional Associations MG via Regional Coordination Groups on Satellite Data Requirements | Regional Coordination Groups on Satellite Data Requirements, with support from ET-SSU | Secretariat (Regional offices, Space Systems and Utilization Division), with the guidance from ET-SSU | Virtual meetings, email exchange, Secretariat work | April 2025 |
| 6 | **Develop regional implementation plan(s)** to address the gaps identified in the gap analyses **for inclusion in the regional operating plans** | Regional Associatiqons | Regional Associations | Secretariat (Regional offices, Space Systems and Utilization Division), with the guidance from ET-SSU | Virtual meetings, email exchange, Secretariat work | TBD by Regional associations |

# WMO Regional Coordination Groups on Satellite Data Requirements

- Established in 2013 (Resolution 12 (EC-65))
- Serve as platforms for **WMO Members to express their needs for satellite data and products**
- Facilitate **regional coordination** on:
  - Satellite data reception equipment
  - Visualization tools
  - Related training and capacity building
- Act as a **bridge between Members and satellite data providers** active in each region
- Support **user engagement** by:
  - Facilitating communication with space agencies
  - Assisting with technical aspects of data access and processing
  - Responding to specific user requests and needs

- RA I Dissemination Expert Group
- RA II WG-I Expert Team on Satellite Observations and Applications
- RA III and RA- IV Coordination Group on Satellite Data Requirements
- RA V WG-I Expert Team on Satellite Utilization

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# RA-III/IV Gap Analysis

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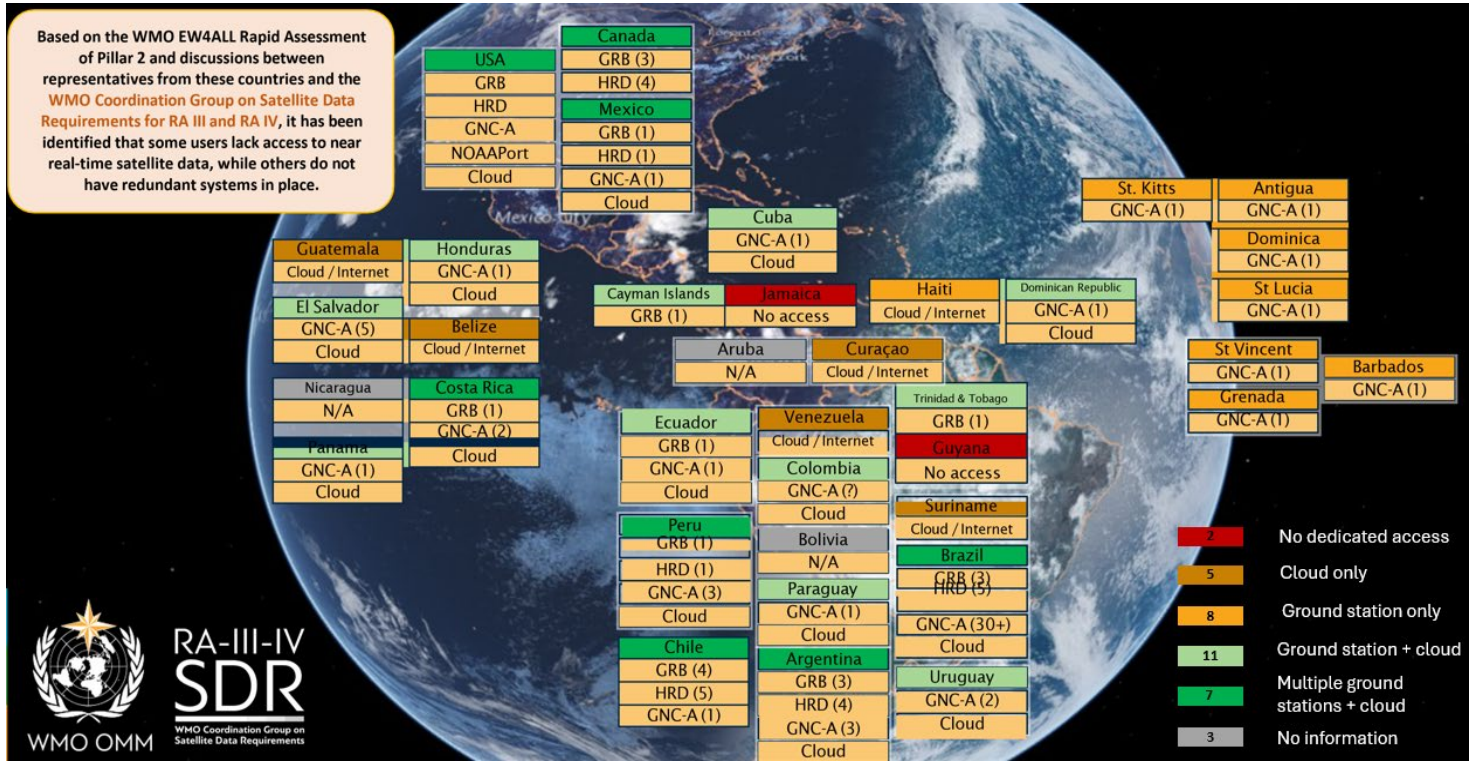
# Activities conducted by RA-III-IV-SDR-Group in support of EW4ALL

## Recent progress:

- Conducted mapping exercise among Members
- Ongoing gap analyses on satellite data utilization for EW systems
- Proposed CREWS Accelerated Support Window project to strengthen EW systems in selected countries
- Launched VLab-led project to develop training resources for priority hazards in the Region
- Conducted Virtual EW4All Workshops
  #1 satellite data access
  #2 satellite data utilization for monitoring priority hazards




Enhancing satellite data accessibility and system redundancy is essential for building more resilient early warning systems in the Region.

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# CREWS Accelerated Support Window project

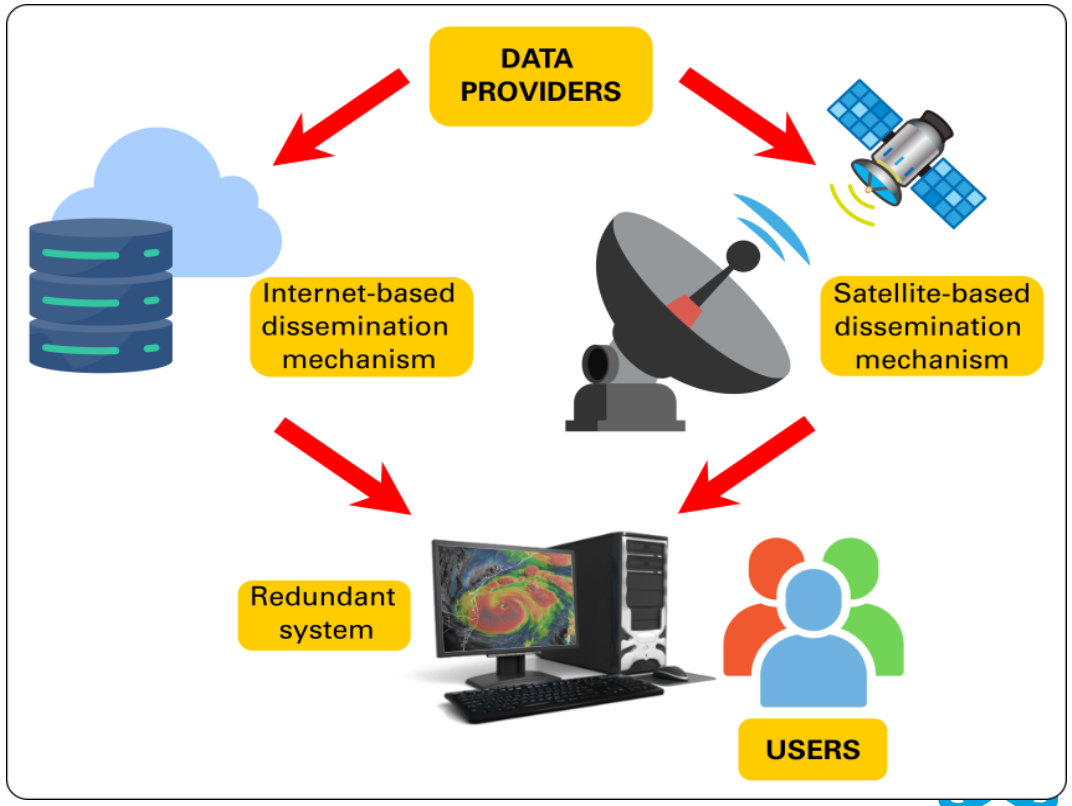
**Pilot Project: Strengthening Early Warning Systems in pilot countries in the Caribbean & Latin American through improving Satellite Data utilization**

***Guyana, Suriname, Jamaica, and Belize***

**Objectives**

- To enhance the capacity of targeted countries in the Caribbean and Latin America for effective satellite data utilization, thereby strengthening their EWS.
- Strengthened EWS through improved technical capacity and infrastructure.
- Empower Members to leverage satellite data for precise hazard monitoring and forecasting, enabling the delivery of timely, actionable information that supports preparedness, risk reduction, and response efforts.
- Impact their ability to produce early warning services for their respective populations, especially those most at risk.

Improving Data Access with Redundant Systems




Infrastructure challenges | Technical support | Comprehensive training

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# RA-II/V Gap Analysis

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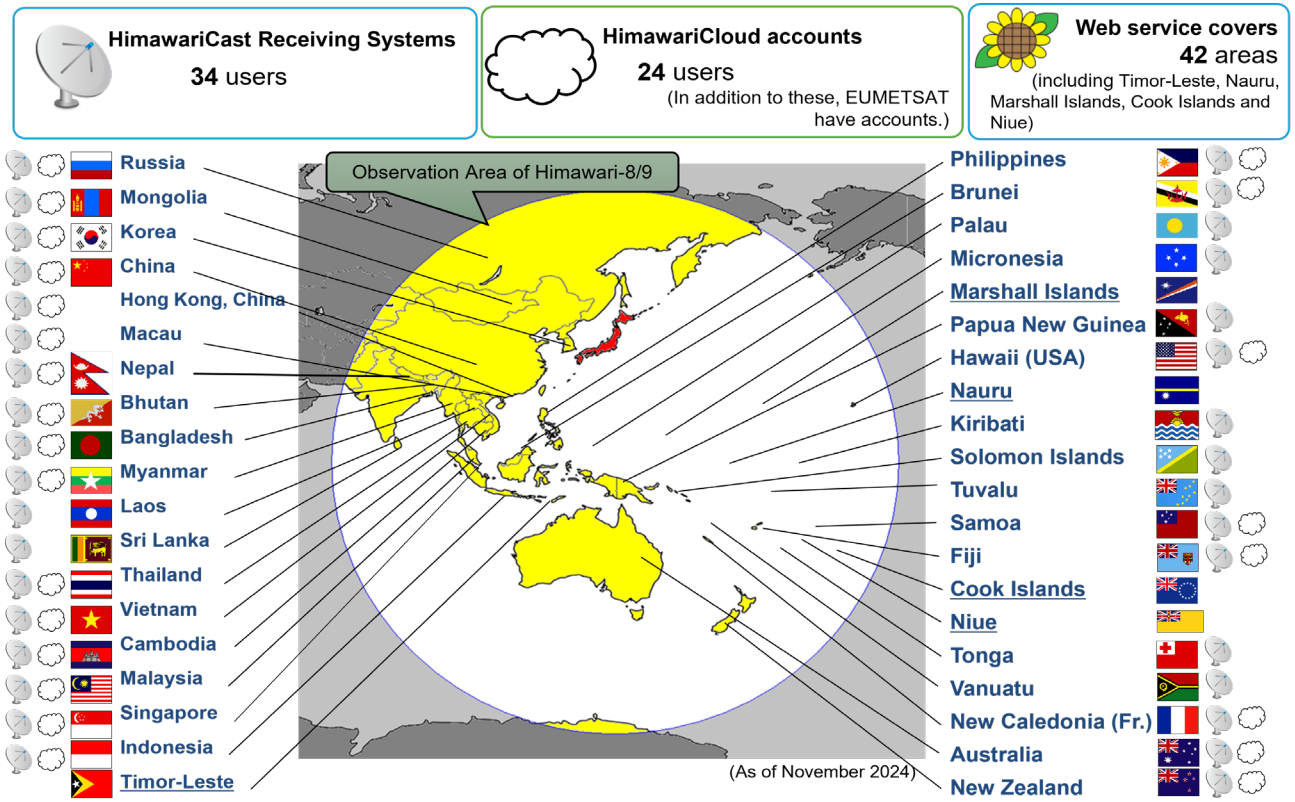
# Himawari Satellite Data Access Status in RA-II/V

- HimawariCast Receiving and Processing Systems upgrade project in preparation
  - Since the installation of these systems in 2016 the receivers, processing servers, and associated equipment have become obsolete.
- Covering 19 NHMSs in the East Asia and Western Pacific
- Objective to upgrade equipment for JMA HimawariCast receiving and processing systems
- To ensure real-time operations and, as a result, strengthen their capacity for early detection of and responses to severe weather events
- Join effort between JMA and WMO to support the tendering process

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# Satellite Data Access Issues in RA-II/V

## GEO Satellite Data

- **Widespread issues** reported with accessing **FY-2/FY-4** satellite data.
- **GK-2A data** is available via direct reception, FTP, or online viewer, but **remains underutilized** in many countries.

## LEO Satellite Data

- Many users are either unaware of available products (e.g., ocean winds, precipitation) or lack the training to apply them effectively.
- Very few countries operate LEO direct reception systems.
- Primarily accessed online through platforms like WorldView, STAR, and GSMaP.

# Infrastructure Gaps in RA-II/V

## Internet Connectivity Issues

- Slow or unreliable internet limits access to near real-time satellite imagery and key forecasting products.
- Impacts ability to monitor rapidly evolving hazards (e.g., thunderstorms, mesoscale systems, wildfires).
- Reported by several countries in RA-II and RA-V.

## Gaps in Data Storage Capacity

- Lack of systems for storing, archiving, and retrieving historical satellite data.
- Affects research, analysis, and climate monitoring capabilities.

## Visualisation systems limitations

- Limited capacity for multi-dimensional analysis and integration with other data sources (e.g., radar, NWP, in-situ).
- JMA's SATAID (Satellite Animation and Interactive Diagnosis) is the most commonly used tool.
- LEO data is mainly viewed via online portals such as CIRA SLIDER, Eumetview, Worldview, EO Browser, Fengyun Live.
- Countries express a strong need for continued training on the effective use of visualization platforms.

# Training Gaps in Satellite Data Utilization in RA-II/V

## Technical and IT Skills

- Limited training for IT staff on satellite system administration (e.g., data processing, server management, troubleshooting).
- Specific needs include big data processing, system operations, and visualization system management.

## Data Utilization and Analysis

- Gaps in applying request-based high-frequency observations and ASCAT winds for tropical cyclone monitoring.
- Limited knowledge of NWP models, data assimilation, and use of satellite data for lightning/thunderstorm warnings.
- Need for training in open-source tools (e.g., Python, SATAID) for data visualization and product development.

## Product-Specific Training

- Precipitation and drought monitoring products
- Wave height and sea surface height products
- Hotspot detection tools
- Local use of LightningCast in absence of lightning sensors

# RA-I Gap Analysis

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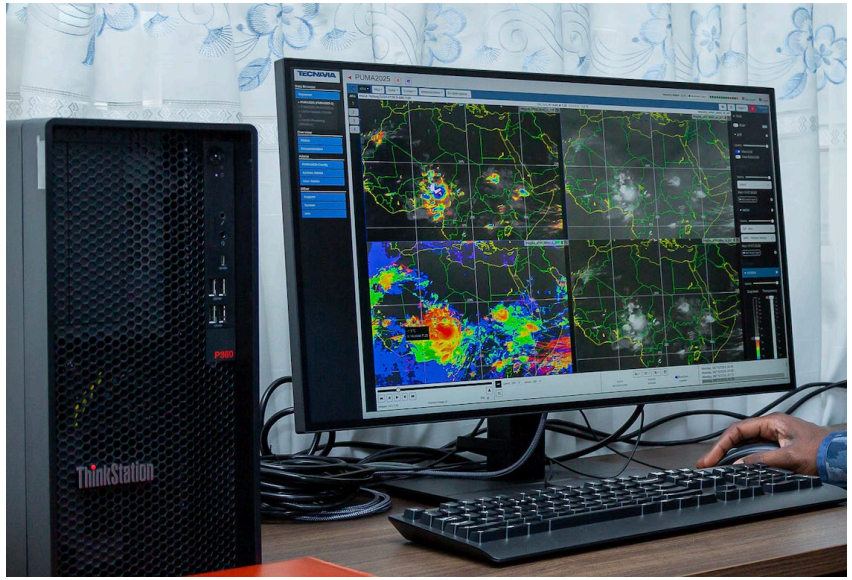
# Meteosat-12 (MTG) Satellite Data Access Status in RA-I

- First 22 installations of PUMA 2025 have been completed
- Additional 34 installations are to be completed in due course
- Due to the limited bandwidth on EUMETCast Africa, the MTG data is tailored to provide the best fit for the needs of the African user community.
- Customised Meteosat-12 FCI level 1c and level 2 data disseminated via EUMETCast Africa, which form the MTG Africa data service, were released publicly on 6 March 2025.
- EU and AUC announced Space for Early Warning (SEWA) (2025-2028) in Africa to support use of MTG satellite data, NWP data nowcasting and AMSAF in each region

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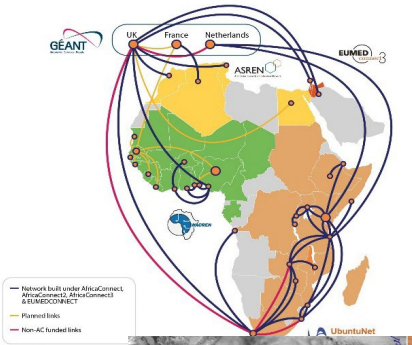
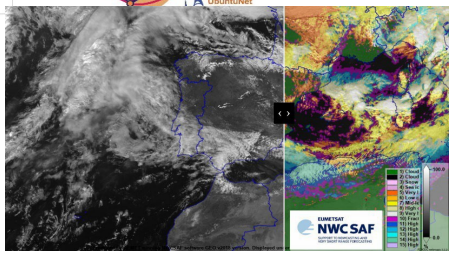
# Space for Early Warning in Africa

- EU and AUC announced new project to support use of space for early warning in Africa for 2025-2028.

- Objectives:
  - Accompany MTG transition
  - Maintain RARS Africa to improve NWP models (global and regional)
  - Establish ASMAF Nowcasting in each region

- Covering:
  - Consolidate existing infrastructure
  - Further upgrade of PUMA-2025 stations for Early Warning applications
  - Upgrade and maintenance of the four RARS-Africa
  - Provide new access mechanism
  - EUMETCast-Terrestrial (for all MTG data) via NRENs
  - Cloud-computing for Nowcasting

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**To be considered by CGMS:**

- **For action**: Space agencies are invited to continue contribution towards closing the gaps in access and interpretation of satellite data/products in support of EW4ALL.