Regional Activities in Support of the EW4All Initiative: Summary of Regional Gap Analysis

Presented in CGMS-54 Plenary, Agenda Item: 2

Coordination Group for Meteorological Satellites

WORLD METEOROLOGICAL ORGANIZATION

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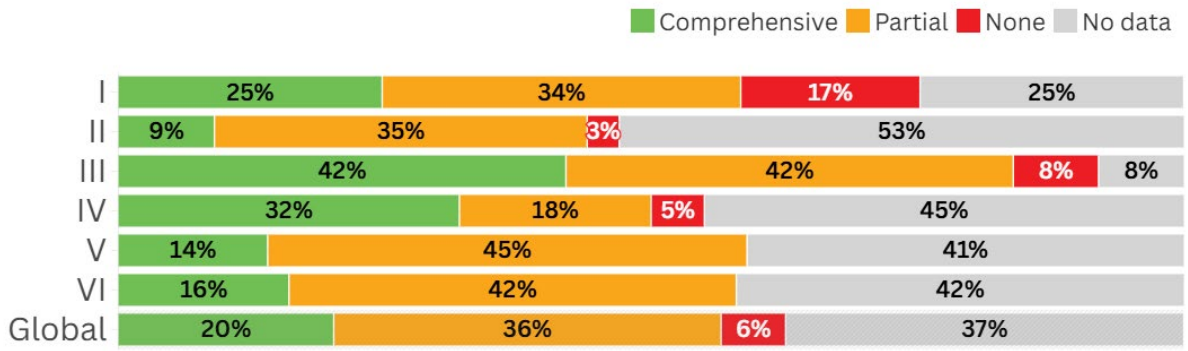
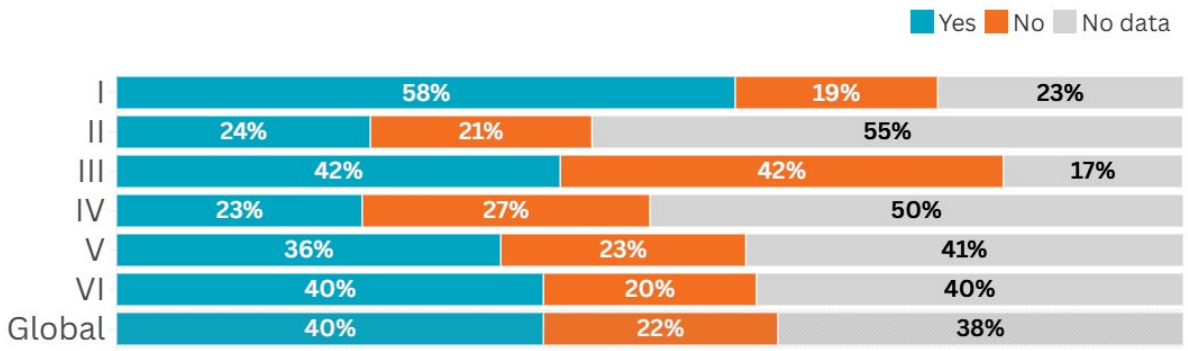
WMO, version 01, Date: 28 May 2026

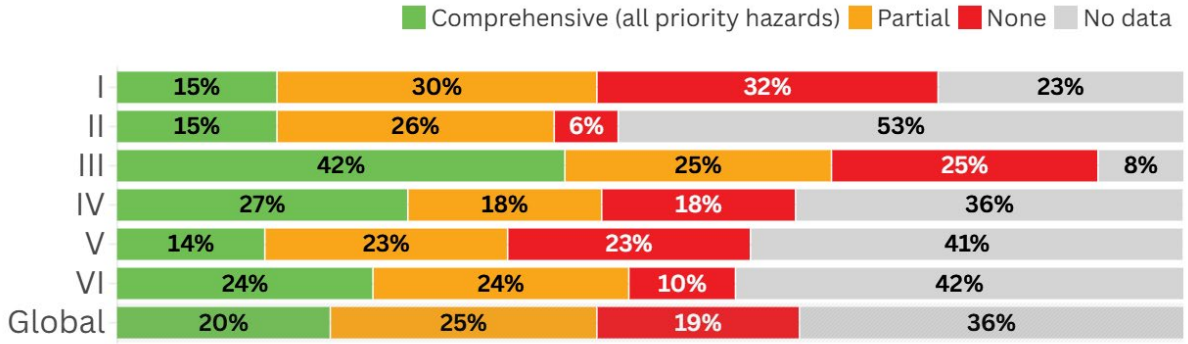
EW4All: Global overview



Use of satellite data to monitor priority hydrometeorological hazards.



NHMS accessing satellite data with a satellite reception station



Extent to which forecasters are trained to use satellite data for hydrometeorological hazard monitoring.

🌎 Key Figures (EW4All – Satellite Use)

- **56%** of Members use satellite data for at least one priority hazard
- **20%** use satellite data for *all* priority hazards
- **About 20%** of Members report **no training** for forecasters
- **25%** require **additional capacity development**
- **40%** operate **dedicated satellite reception stations**
- **22%** rely **only on internet access** for satellite data

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Source: WMO Monitoring System (June 2025)

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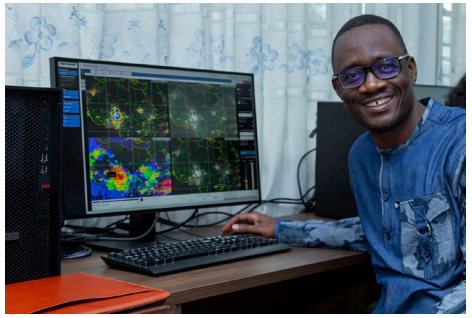
EW4All: RA-I (Africa)

- Activities led by RAIDEG with support from EUMETSAT
- **SEWA initiative** (Africa–EU Space Partnership)
- Upgrade of ground infrastructure:
  → PUMA 2015 → PUMA 2025 (MTG reception)
  → Direct Broadcast stations upgraded
- Establishment of African Satellite Application Facility
  → Focus on severe weather nowcasting

Focus on training on MTG Products and PUMA-2025 (usage and maintenance)



🌍 **Key Findings – WMO Monitoring (June 2025)**

Satellite reception

– Generally strong across the region, with some remaining gaps

Application gaps

– Satellite data not fully utilized for priority hazards such as floods and droughts

Capacity needs

– Insufficient training in satellite data use for priority hazards such as floods and droughts

– Additional gaps in monitoring:
→ thunderstorms, squall lines, lightning
(e.g. Djibouti, Guinea, Liberia, Sierra Leone, Somalia, Uganda)

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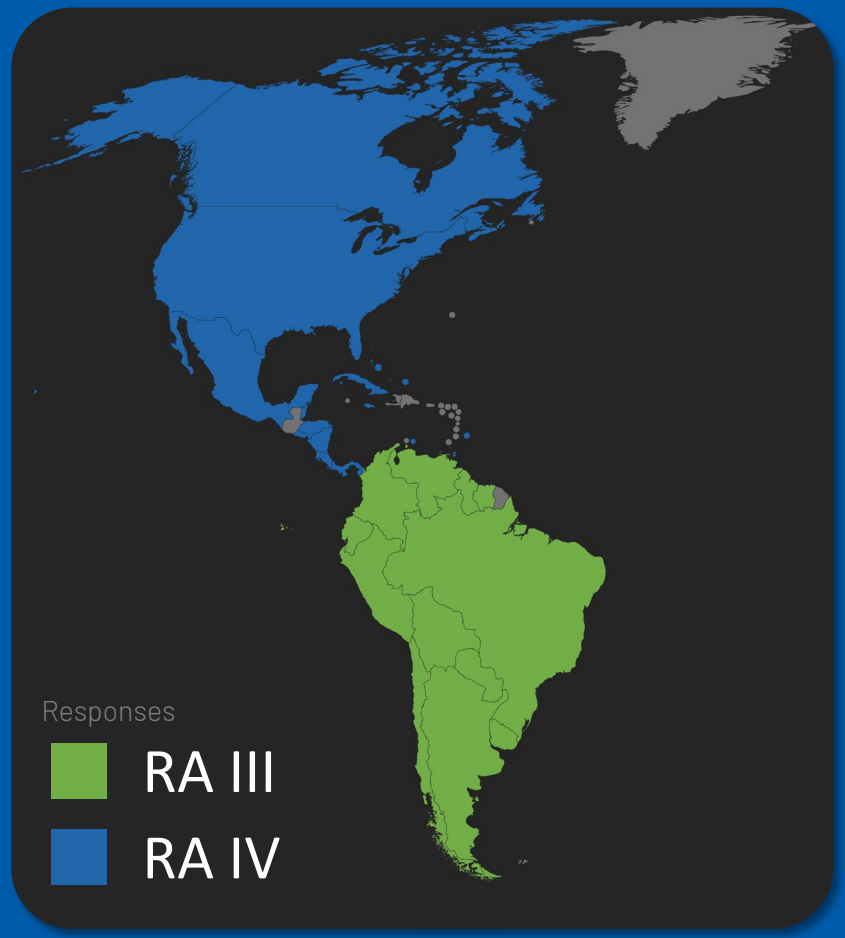
RA II and RA V: Summary of gap analysis

- User needs:
  - more frequent observations of surface winds and wind fields for tropical cyclones
  - higher temporal and spatial resolution rainfall products
  - drought monitoring products
  - lightning observations
- Satellite operators provide many products – it's possible that users don't know where to find the products, or how to use them. Needs further investigation
- Infrastructure gaps:
  - **slow internet connectivity** can impact the ability to receive 10 minute and 2.5 minute geo satellite images in NRT
  - some countries report a lack of **data storage**, **archival and retrieval systems**, for analysis, climate monitoring
  - **visualisation systems** that integrate all observations. Online tools widely used (e.g. CIRA SLIDER, Eumetview, Worldview, EO Browser, Fengyun Live, FengYun Earth)
- Ongoing training required
  - Utilisation: where to find data and products,, how to use data and products
  - IT related: data processing, server management, troubleshooting

Survey Overview

WMO RA III and RA IV EW4All Survey on the Use of Satellite Data to Monitor Weather Hazards



29

Countries

61

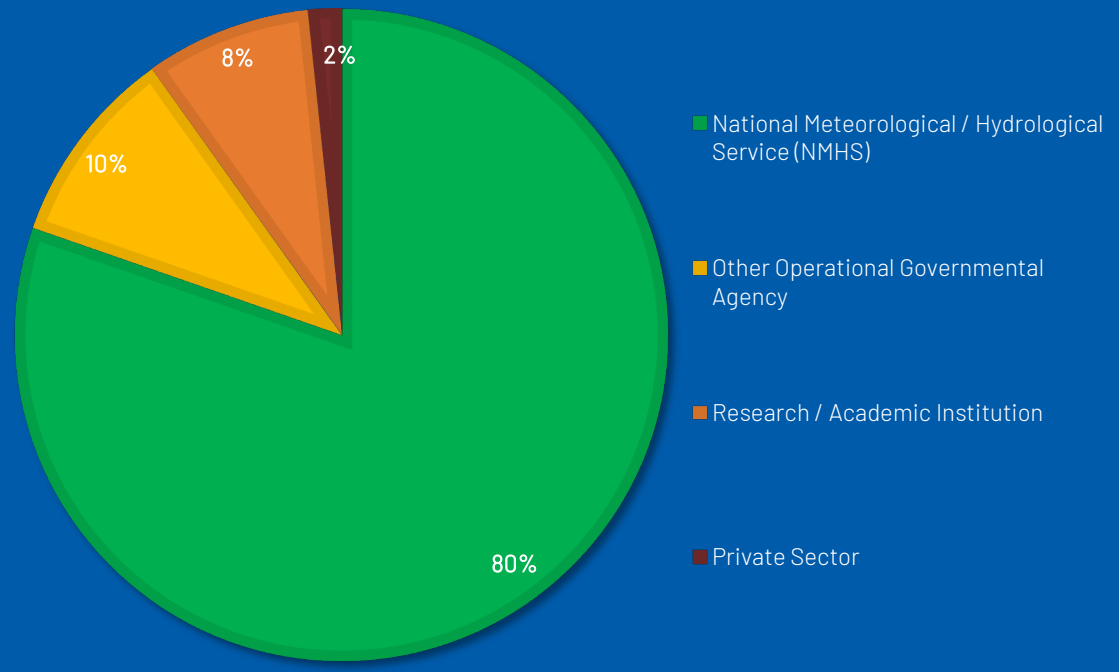
Responses

Questions:

- Personal Information (6)
  Organization, Institution type, etc.
- Top 5 Hazards (5)
  5 questions per hazard
- Data Usage (6)
  Challenges, Success, MDS, R2O

12 members from RA III and 17 from RA IV

Argentina, Bahamas, Barbados, Belize, Bolivia, Brazil, Canada, Chile, Colombia, Costa Rica, Cuba, Curaçao, Ecuador, El Salvador, Guyana, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Sint Maarten, Suriname, Trinidad and Tobago, Turks and Caicos Islands, Uruguay, USA and Venezuela



RA-III-IV SDR

Survey Distribution: November 20 2024 to April 10 2025

Priority Hazards anaylised

WMO RA III and RA IV EW4All Survey on the Use of Satellite Data to Monitor Weather Hazards

Hazard: Floods

Each respondent was asked to identify the top five hazards affecting their country. The following countries selected **floods** as one of their top hazards:

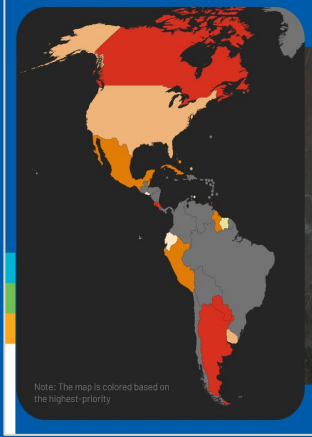
Considered as:

First Hazard	Second Hazard	Third Hazard
Barbados	Argentina	Argentina
Ecuador	Chile	Chile
Guyana	Ecuador	Colombia
Mexico	Honduras	Trinidad and Tobago
Panama	Jamaica	
Suriname	Mexico	
	Sint Maarten	
	Turks and Caicos Islands	

Fourth Hazard	Fifth Hazard
Mexico	Argentina
Paraguay	Brazil
Venezuela	Costa Rica

Note: In some cases, countries appear more than once with varying priorities due to multiple submissions from respondents within the same country.

Hazard: Thunderstorms / Squall Lines



Each respondent was asked to identify the top five hazards affecting their country. The following countries selected **thunderstorms / squall lines** as one of their top hazards:

Considered as:

First Hazard	Second Hazard	Third Hazard
Argentina	Argentina	Canada
Canada	Bahamas	Mexico
Costa Rica	Belize	Sint Maarten
Paraguay	Cuba	Turks and Caicos Islands
Trinidad and Tobago	Guyana	Uruguay
	Mexico	USA
	Peru	

Fourth Hazard	Fifth Hazard
Argentina	Ecuador
Canada	El Salvador
Curaçao	Mexico
Suriname	

Note: In some cases, countries appear more than once with varying priorities due to multiple submissions from respondents within the same country.

Hazard: Drought / Dry Spell

Each respondent was asked to identify the top five hazards affecting their country. The following countries selected **drought / dry spell** as one of their top hazards:

Considered as:

First Hazard	Second Hazard	Third Hazard
El Salvador	Brazil	Costa Rica
Mexico	Chile	Honduras
Nicaragua	Mexico	Jamaica
	Panama	Venezuela
	Suriname	

Fourth Hazard	Fifth Hazard
Ecuador	Barbados
	Peru
	Turks and Caicos Islands
	Uruguay

Note: In some cases, countries appear more than once with varying priorities due to multiple submissions from respondents within the same country.

Hazard: Rain / Wet Spell

Each respondent was asked to identify the top five hazards affecting their country. The following countries selected **rain/wet spell** as one of their top hazards:

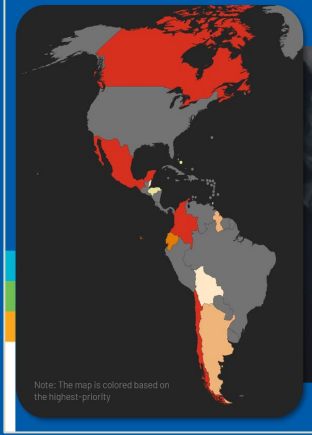
Considered as:

First Hazard	Second Hazard	Third Hazard
Argentina	Argentina	Argentina
Colombia	Canada	Colombia
Ecuador	Colombia	Panama
Peru	El Salvador	
Uruguay	Turks and Caicos Islands	
USA		
Venezuela		

Fourth Hazard	Fifth Hazard
Costa Rica	Trinidad and Tobago
Mexico	

Note: In some cases, countries appear more than once with varying priorities due to multiple submissions from respondents within the same country.

Hazard: Forest Fires



Each respondent was asked to identify the top five hazards affecting their country. The following countries selected **forest fires** as one of their top hazards:

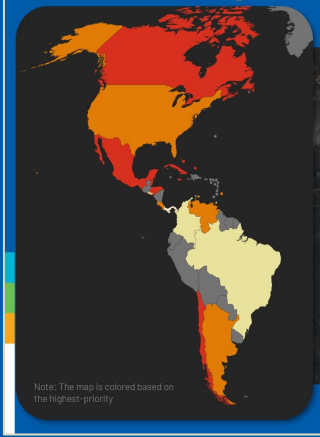
Considered as:

First Hazard	Second Hazard	Third Hazard
Canada	Colombia	Argentina
Chile	Ecuador	Canada
Colombia	Mexico	Ecuador
Mexico		Guyana
		Mexico

Fourth Hazard	Fifth Hazard
Argentina	Argentina
Bahamas	Belize
Canada	Bolivia
Chile	Guyana
Honduras	Mexico
	Trinidad and Tobago

Note: In some cases, countries appear more than once with varying priorities due to multiple submissions from respondents within the same country.

Hazard: Tropical Cyclones



Each respondent was asked to identify the top five hazards affecting their country. The following countries selected **tropical cyclones** as one of their top hazards:

Considered as:

First Hazard	Second Hazard	Third Hazard
Bahamas	Argentina	Argentina
Belize	Barbados	El Salvador
Canada	Costa Rica	
Chile	Curaçao	
Cuba	USA	
Honduras	Venezuela	
Jamaica		
Mexico		
Sint Maarten		
Turks and Caicos		

Fourth Hazard	Fifth Hazard
Brazil	Canada
Colombia	Colombia
Trinidad and Tobago	Mexico
	Panama
	USA

Note: In some cases, countries appear more than once with varying priorities due to multiple submissions from respondents within the same country.

Gap Analysis Outcomes: Floods

1. Key Challenge Identified:

- Users reported **data inadequacies** (Spatial resolution, Temporal resolution, Data latency)
- A **need for advanced training** was identified:

  63% of users reported only **moderate success** in using satellite products for flood monitoring.

  Just 7% reported being **very successful**, indicating a gap in effective application of available data.

2. Flood Monitoring Insights:

- **Precipitation estimates** are the most widely used product for flood monitoring.
- **NOAA Flood Map Products** were mentioned by only one user, suggesting **limited awareness or use**.
- **SAR data** was cited by just two users, indicating it is **underutilized**.
- **GOES data** is used frequently, which may reflect **user expectations for improved spatial resolution**.

3. Recommendations and Takeaways:

- **Provide training** on NOAA Flood Map Products to improve awareness and adoption.
- **Develop practical exercises** on using **Sentinel data** for flood monitoring (e.g., through Jupyter Notebooks as shared in the VLMG-11 meeting).
- **Develop advanced training** on **end-to-end flood event monitoring**, guiding users through the full event lifecycle and showcasing multiple data products.

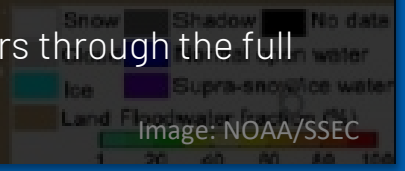
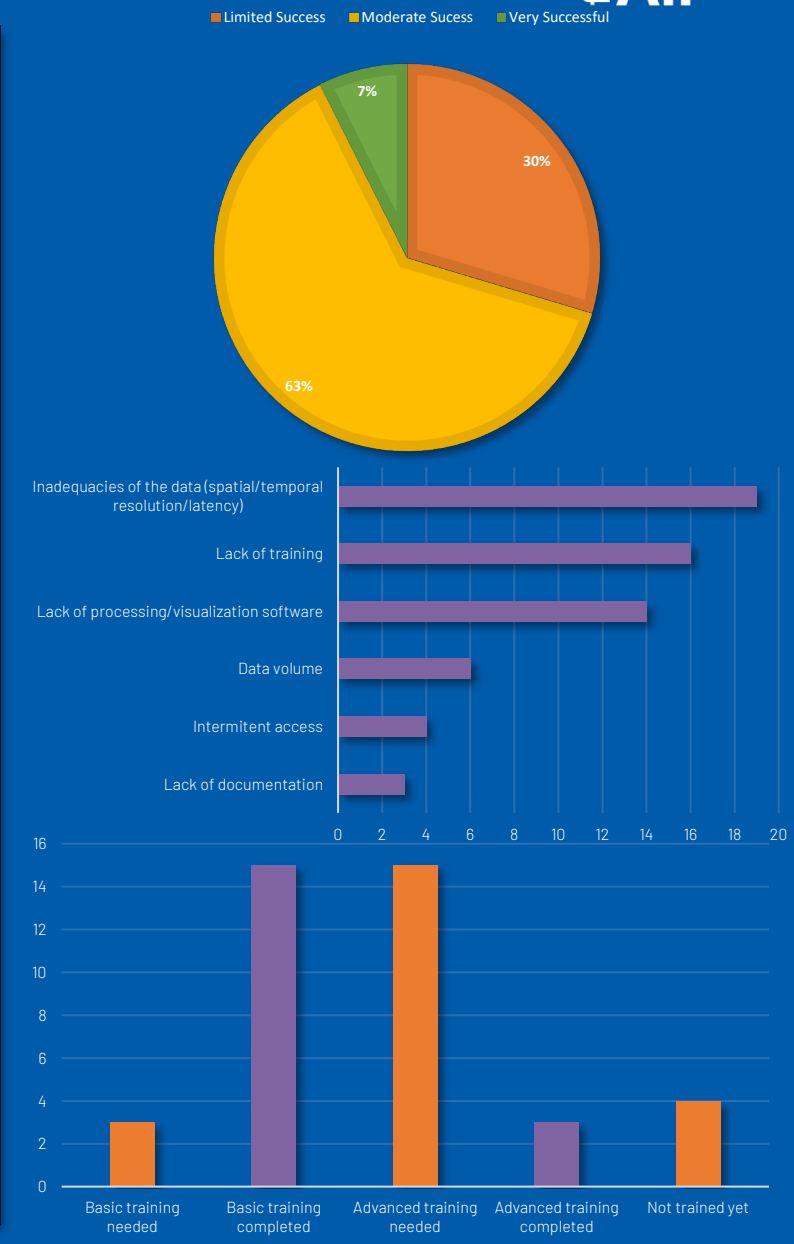


Image: NOAA/SSEC



Region VI: EW4All Rapid Assessment

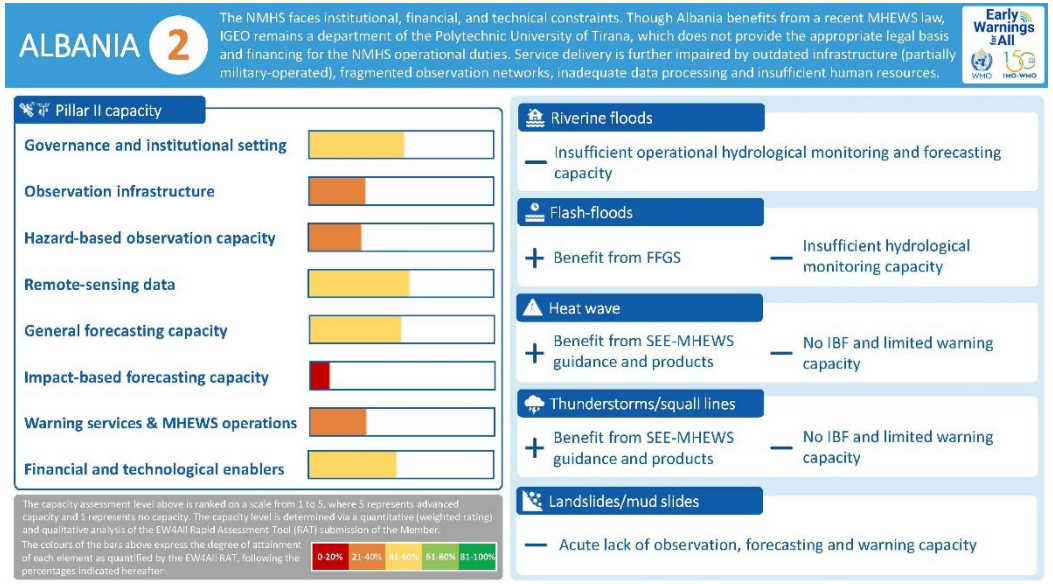
5 = advanced capacity
1 = no capacity

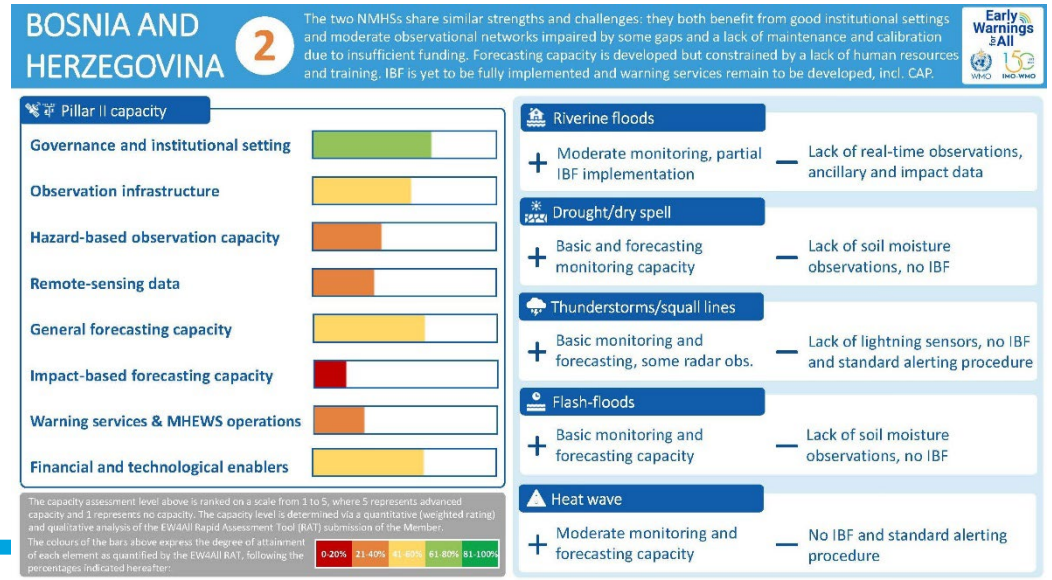
Many countries in Europe (among them EU candidates) **don't have adequate Multi-hazard Early Warning System**

Challenges:

- Big gaps in the observing, data processing and forecasting systems
- Lack of formal links between the stakeholders in the dissemination chain
- Missing regulatory frameworks that connect early warnings to emergency plans

Regional coordination and collaboration → build on and scale up existing efforts and capacities





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RA VI Outcomes

Key gaps

- Some RA VI countries, particularly in parts of Eastern and South-Eastern Europe, including the Caucasus, do not have **direct access to satellite data**
- Many countries in Southeastern Europe lack **access to relevant satellite data to support** their **EW4All priority hazard forecasting** and warning activities.

Capacity development needs

- Tiered **satellite training programs** tailored to different staff proficiency levels
- **Consolidated training opportunities** covering a broad range of satellite applications and related topics
- Specialized **Training of Trainers** programmes to strengthen sustainable internal training capacity

To be considered by CGMS:

For actions

1. CGMS Members are strongly encouraged to continue to support multi-hazard early warning systems, including across the four pillars (disaster risk knowledge; detection, observations, monitoring, and forecasting; warning dissemination and communication; preparedness to respond) and to work with WMO Regional Satellite Data Requirements Groups to address specifically identified gaps through the EW4All gap analysis.