

Progress on EWS implementation in Central America and the Caribbean

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Eighteenth Session of the IOC Intergovernmental Coordination Group for the Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions
(ICG/CARIBE-EWS-XVIII)
(5–7 May 2025, online)

Evolution of WMO data exchange

1963 World Weather Watch

1970s Global Telecommunication System (GTS)

2007 WMO Information System (WIS)

2019 WMO Reform (Earth System Approach)

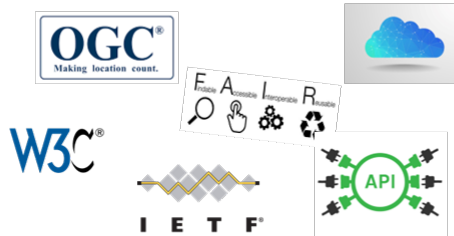
2021 WMO Unified Data Policy (Core, Recommended)

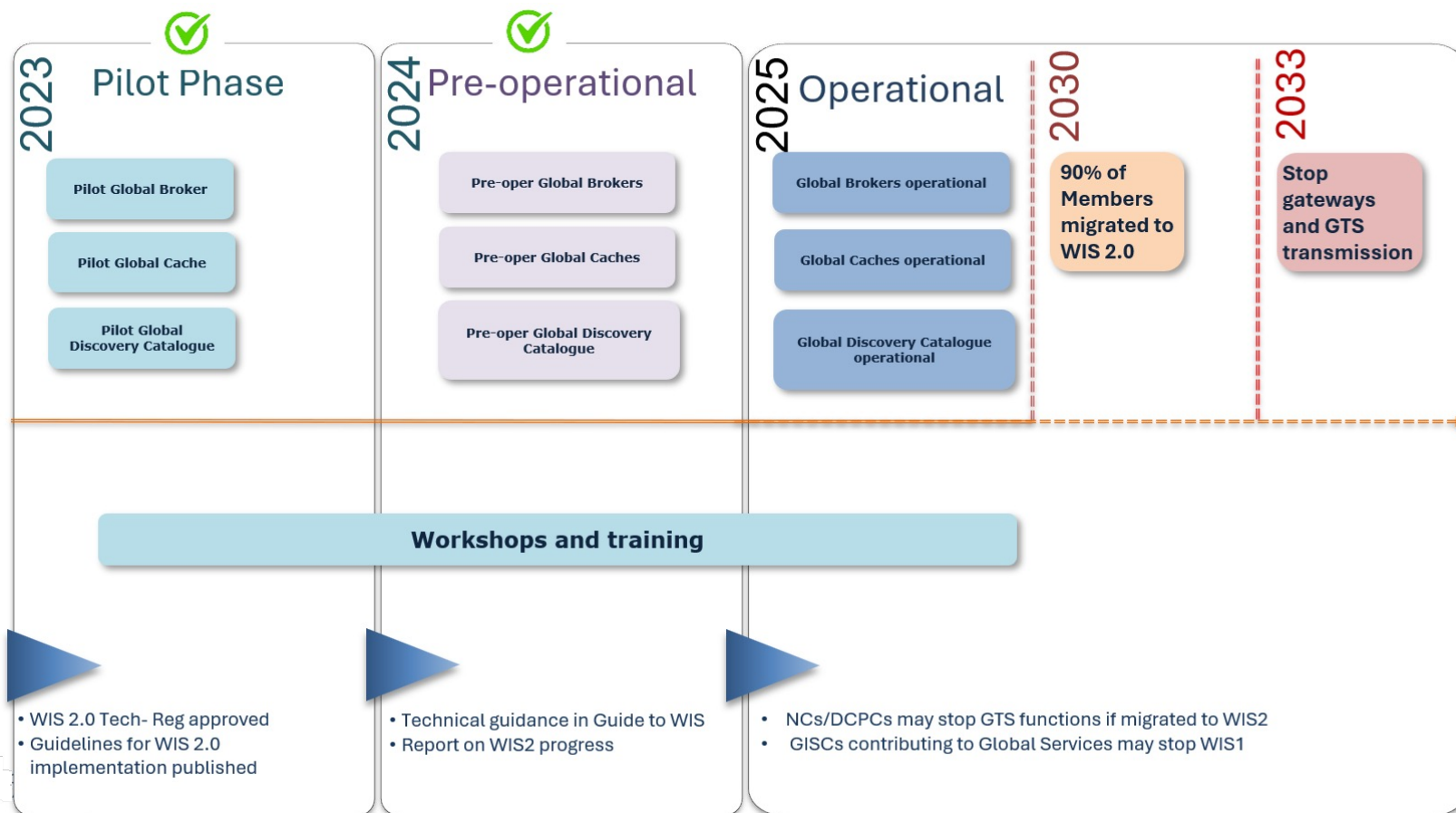


WIS 2.0

... collaborative system of systems using Web-architecture and open standards to provide simple, timely and seamless sharing of trusted data and information ...

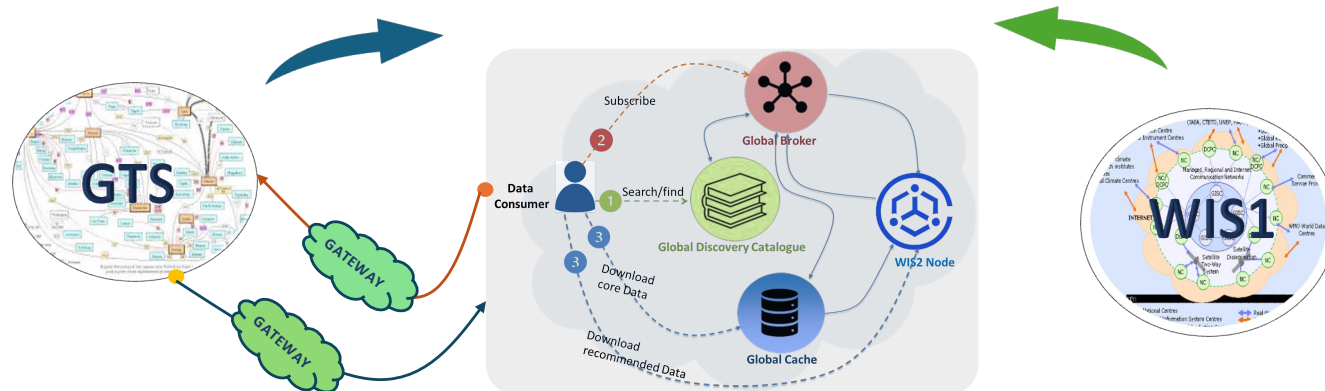
- Open Standards (OGC, W3C, IETF, ...)
- Free and Open Source tooling
- Data sharing through Web and real-time notifications with publication/subscription (pub/sub) protocols
- Cloud ready (turn-key solutions)
- Web services and APIs (Application Programming Interface)





Transition from WIS/GTS to WIS2.0

WIS2



WIS 2.0 Training June 12-16, 2023 Trinidad & Tobago



Cg-19 approved: Resolution 25 -Technical Regulations of WIS 2.0 - A functional requirement of a National Center (NMHS) is “**Operate a WIS node**”

1. Antigua and Barbuda
2. Barbados
3. Belize
4. Cayman Islands
5. Dominica
6. Guyana
7. Grenada
8. Jamaica
9. Saint Lucia
10. Sint Maarten
11. St. Kitts and Nevis
12. St. Vincent and the Grenadines
13. Trinidad and Tobago
14. Turks and Caicos Islands
15. Cuba
16. Argentina



Capacity Building

training workshop complemented by individual coaching on demand to reach both, key people & more people within team

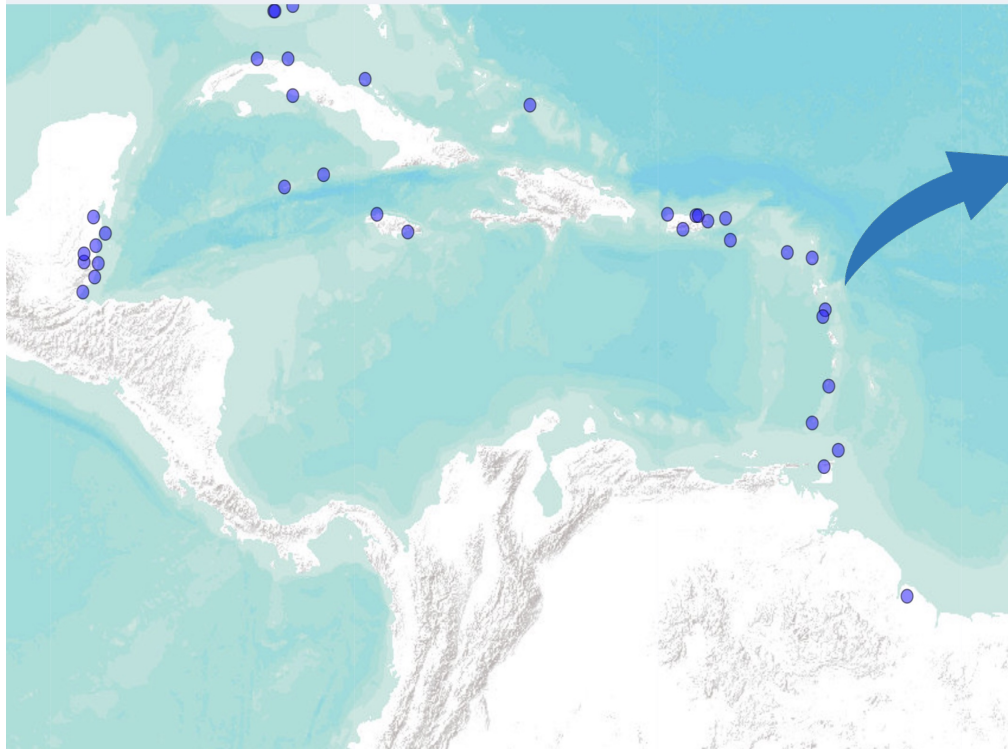
20 professionals (19 Caribbean & 1 Argentina) from 16 NMHSs attended a training workshop at CMO HQ Unit
Hands-on practical exercises emphasized

Caribbean “WIS2Box Node” and National Nodes



November 09, 2023

WIS2.0 Pilot (Surface stations reporting past 24 hours)



CMO Members among global leaders using WIS2 to share data

11 of 16 Members are currently sharing data using BUFR format on WIS2.0 in real time every hour

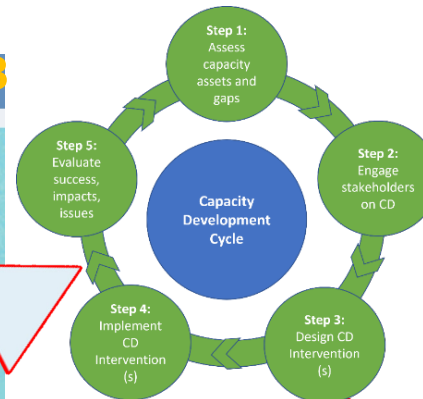
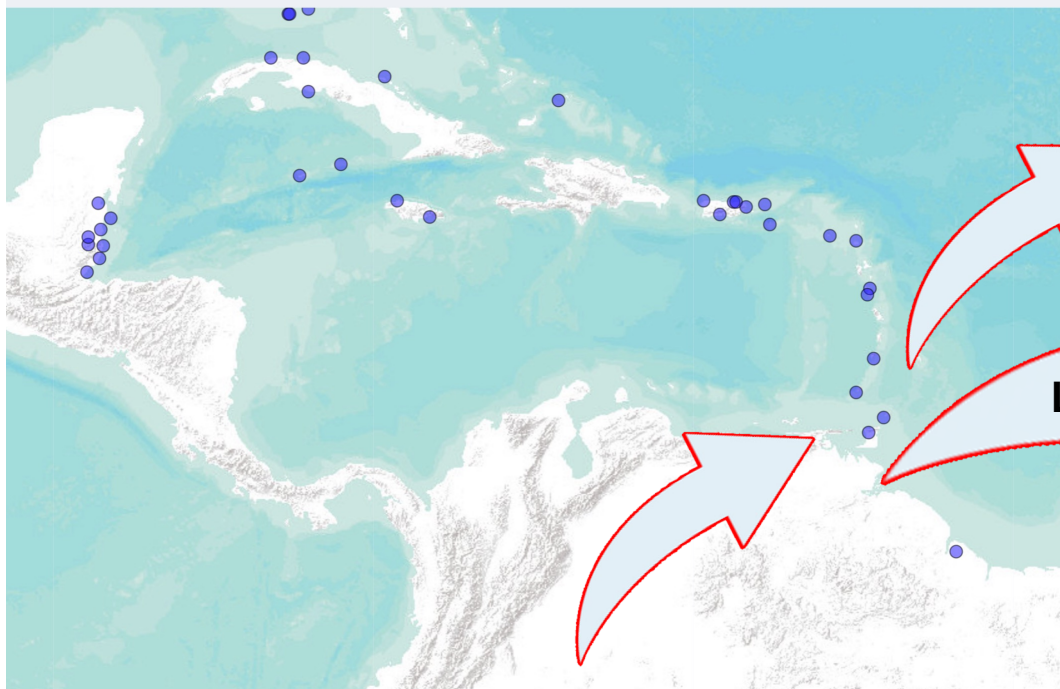
Belize, Trinidad and Tobago created national WIS2 nodes

Barbados, Saint Lucia, BVI, Anguilla, Montserrat

WIS2Box Implementation Linked to EW4All

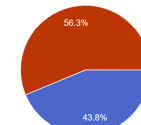


WIS2.0 Pilot (Surface stations reporting past 24 hours) **November 09, 2023**



6.0 Has the Member implemented real-time quality control prior to exchange of observations via the WMO Information System (WIS)?

16 responses

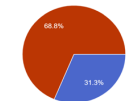


9 of 16 Members do not perform real-time QC prior to disseminating Obs.

Migration from Traditional Alphanumeric Codes (TAC) - FM12 SYNOP to Table-driven Code Form-FM94 BUFR (Binary Universal Form for data Representation).

10.0 Does your NMHS disseminate Synoptic observations using the BUFR format?

16 responses



11 Members have not migrated to BUFR.
5 Members use BUFR to exchange observations.

Linkage to EW4All



Preparedness and response capabilities

- Build national and community response capabilities
- Are response plans up to date and tested?
- Are local capacities and knowledge made use of?
- Are people prepared and ready to react to warnings?



Detection, observations, monitoring, analysis and forecasting of hazards

- Develop hazard monitoring and early warning services
- Are the right parameters being monitored?
- Is there a sound scientific basis for making forecasts?
- Can accurate and timely warnings be generated?



Warning dissemination and communication

- Communicate risk information and early warnings
- Do warnings reach all of those at risk?
- Are the risks and warnings understood?
- Is the warning information clear and usable?

Basic Infrastructure

Observations

Data Collection and Processing

Modelling and Forecasting

Product Generation

Services

Caribbean Implementation WIS 2.0 Node



Member	CMO Caribbean Reference WIS 2.0 Node	Individual Country WIS 2.0 Node	No. of Hourly Observations Exchanged on Average (Oct 31, 2024)	No of Operational Hours Available (UTC)
Anguilla	✓	–	13	(13 hrs) 11:00 - 23:00
Antigua and Barbuda	✓	–	1 - 7	(24 hrs) 12:00-11:00
Barbados	–	✓	24	(24 hrs) 12:00-11:00
Belize	–	✓	24	(24 hrs) 12:00-11:00
British Virgin Islands	✓	–	13 - 16	(16hrs) 11:00 - 02:00
Cayman Islands	✓	–	17	(17 hrs) 11:00 - 03:00
Dominica	✓	–	12 – 15	(17 hrs) 10:00 - 02:00
Grenada	✓	–	24	(24 hrs) 12:00-11:00
Guyana	✓	–	24	(24 hrs) 12:00-11:00
Jamaica	✓	–	0-6	(24 hrs) 12:00-11:00
Montserrat	✓	–	13	(13 hrs) 10:00 - 22:00
Saint Lucia	✓	–	9 - 16	(24 hrs) 12:00 - 11:00
St Kitts and Nevis	✓	–	16	(16 hrs) 10:00 - 01:00
St Vincent & the Grenadines	✓	–	14	(16 hrs) 10:00 - 01:00
Trinidad and Tobago	–	✓	24	(24 hrs) 12:00-11:00
Turks and Caicos Island	✓	–	13	(14 rs) 11:00 - 00:00

16 NMHS implemented WIS 2.0 Node (11 in 2023)

WIS 2.0 nodes set to exchange data hourly

The Systematic Observations Financing Facility – SOFF

A specialized United Nations climate fund co-created by the WMO, UNEP and UNDP – hosted by WMO

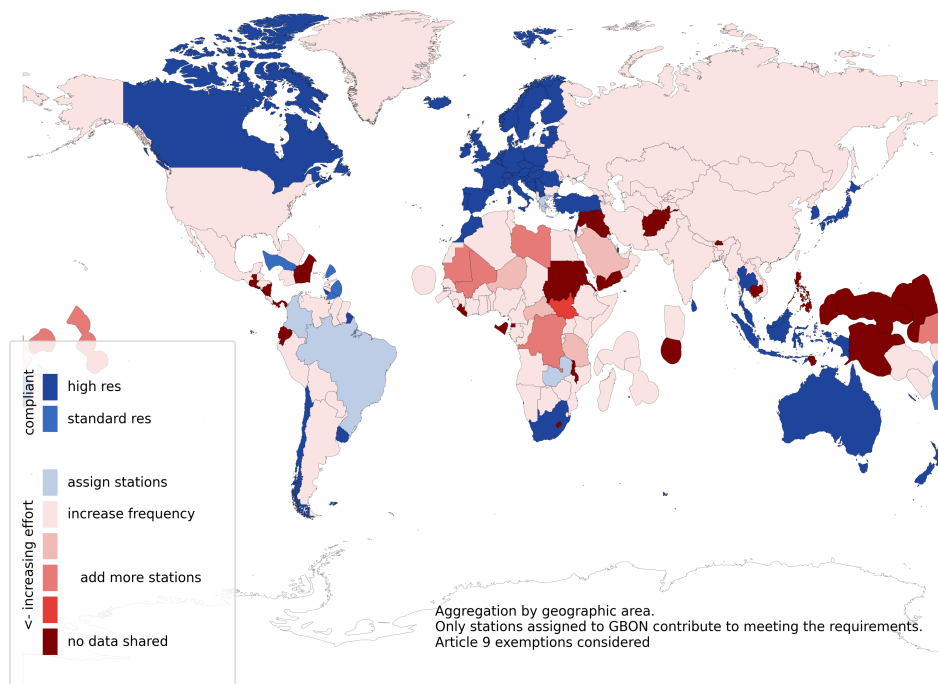
Established to fill in **major gaps in basic weather and climate data** in the countries with the biggest capacity constraints – LDCs and SIDSs

Mandated to support the implementation of the Global Basic Observing Network – **GBON**

Foundational element of the UN Early Warnings for All Initiative



GBON Compliance Q3 2024 (Surface)



SOFF phases of support

Readiness

GBON gap analysed and screened (NGA)
GBON national contribution developed and screened (NCP)
Country Hydromet Diagnostics undertaken (CHD)



SOFF funding for peer advisory services to support the country in developing these products

Investment

GBON infrastructure in place
GBON human and institutional capacity developed



SOFF provides a grant for the implementation of the GBON National Contribution Plan, i.e., GBON stations and capacity building

Compliance

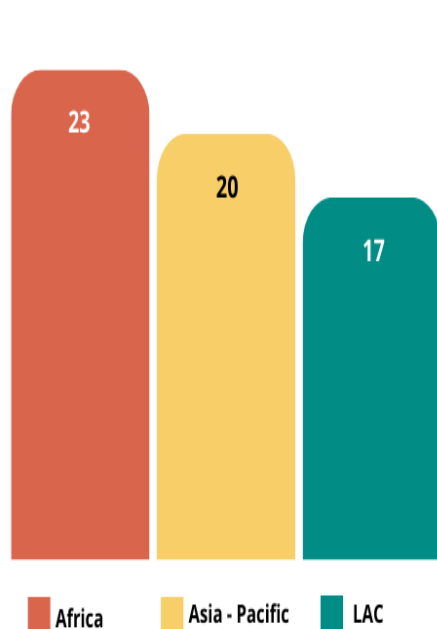
GBON data internationally shared and results-based finance provided



SOFF provides annual results-based payments for GBON-verified data sharing.

Regional breakdown

Readiness phase



Africa

Total Readiness funding approved:
USD 3.7 Million

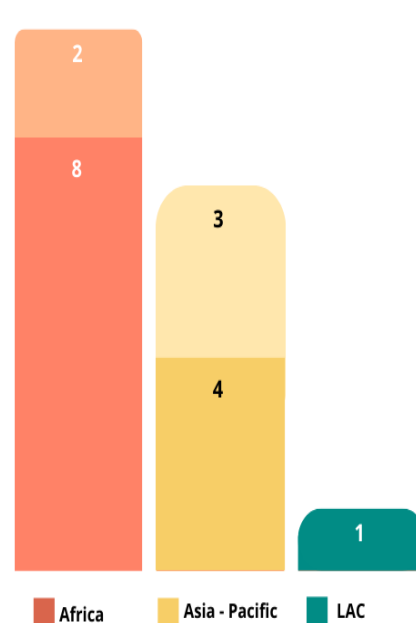
Asia-Pacific

Total Readiness funding approved:
USD 2.6 Million

LAC

Total Readiness funding approved:
USD 2.7 Million

Investment Phase



Africa

Total Investment funding approved (8):
USD 50 Million

Total Investment funding conditionally approved (2):
USD 8 Million

Asia-Pacific

Total Investment funding approved (4):
29 Million

Total Investment funding conditionally approved (3):
USD 18 Million

LAC

Total Investment funding approved (1):
USD 0.8 Million



Disaster Risk Knowledge

Observations & Forecasting

Dissemination
& Communication

Preparedness & Response

Demonstrating Results



55 countries out of 195 report having available disaster risk information

this represents a year-to-year **increase of 31%**



Global hazard forecasting is improving

Yet, **75% of assessed WMO Members still lack adequate capacity**, mostly in LDCs & SIDS



100 countries report disseminating warnings

45 countries report use of **Cell Broadcast** for warning dissemination in 2024



In 2023, **47 countries** had at least one Anticipatory Action framework, nearly **doubling from the previous year**

Demonstrating Results

Expanded Access to EW Dissemination Technologies

Deployment of CB technology for rapid and inclusive alert dissemination in ECTEL countries, Haiti, and Somalia, enhancing timely communication of warnings to at-risk populations.

Enhanced Regional and National Capacities in Alert Standardization

Strengthened institutional capacity CAP implementation through targeted training for Mauritania, Somalia, and SADC Member States

Improved Connectivity for Resilience

Delivered the **Disaster Connectivity Map** to better understand and address communications infrastructure gaps and support resilience of telecommunications systems during disasters

Demonstrating Results

Strengthened Risk Knowledge for Actionable Early Warnings

Established operational framework for risk knowledge generation and use for EWS in Mozambique, (& ongoing in other countries), enabling risk-informed decision-making.

Institutionalization of AA in Domestic Systems

Advanced national coordination and advocacy in 10+ countries; fostering alignment of AA frameworks with national DRM systems. AA frameworks tied to pre-arranged financing in 68 countries, for scalable EA ahead of crises

Enhanced Preparedness Through Simulations

Strengthened EWS through simulations and scenario-based exercises; Madagascar, Mauritius, Seychelles, and Bangladesh in 2024 and further countries to be covered in 2025

Progress on EW4All in Central America and the Caribbean



■ National Consultation Workshops Completed *(conducted the gap analysis, and developed an implementation plan to address gaps and outline financing strategies)*

- Antigua & Barbuda, Barbados, Ecuador, Guatemala and Haiti

17 Upcoming Workshops

- Guyana: 24–26 June 2025
- Belize: 5–7 June 2025

🔍 Other Interested Countries

- Panama, Costa Rica, St. Kitts and Nevis, Grenada, Suriname *(not yet confirmed)*

💰 GCF Multi-country Project

- Approved in Jan 2025
- USD 12M per country / 5 years
- Implemented by UNDP
- Pillar leads: UNDRR, WMO, ITU, IFRC

🌐 Countries Included in GCF Project

- Ecuador and Antigua & Barbuda

Implement & Operationalize the Common Alerting Protocol (CAP)



Deadline: 2023 and Onward

Status : Started

Two (2) Workshop on Implementing CAP held in Belize & Turks and Caicos Islands



Collaborative effort:

- National Meteorological Services
- CMO Headquarters Unit
- World Meteorological Organization

Funded by:




Climate Risk & Early Warning Systems (CREWS)

CAP Implementation in Central America and the Caribbean

CAP Trainings (2024–2025)

- **Dominican Republic & Panama** (*Spanish*)
 - Webinar series (4 sessions) | April–May 2024
 - CAP implemented: Dominican Republic (Sept 2024)
Panama (Jan 2025)
-  **Caribbean Countries** (*English*)
 - Webinar series (2 sessions) | May 2024
-  **Regional Workshop – Latin America & Caribbean** (*Spanish*)
 - CAP & Impact-Based Forecast and Warning Services (IBFWS)
 - Held in Chile | 9–13 December 2024
- **Dominica, Saint Lucia, Grenada**
 - National Workshops (2 days each) | 27 Jan – 4 Feb 2025

CAP Implementation Status – RA IV

Status	# of Countries	%
 Operational / Compliant	14	54%
 Testing / Development	9	35%
 Not Started	3	11%

WMO is supporting Members in advancing CAP compliance through various capacity development options. This includes South-South cooperation among NMHSs, as well as collaboration with regional institutions such as the CIMH and the CMO. Support is provided through webinars, regional events, and targeted national training workshops.

Strengthening Service Capacity: Including Marine and Ocean Services



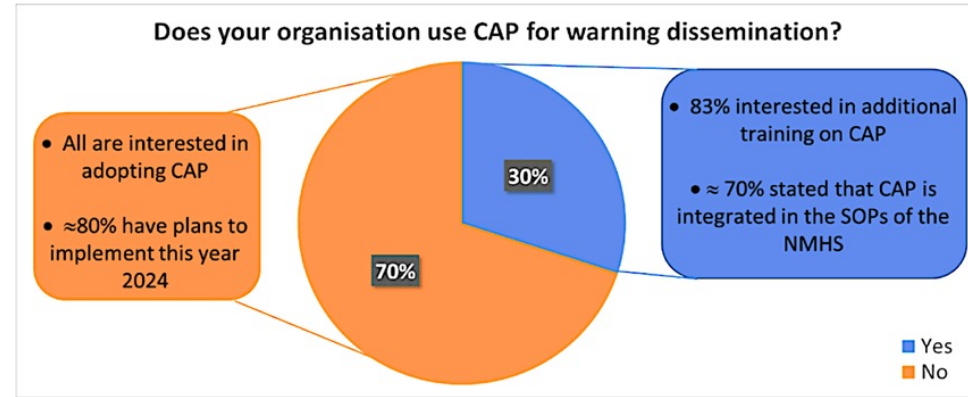
Common Alerting Protocol (CAP) WMO recommended practice

Implementation of CAP and IBFWS are key approaches/milestones for EW4All

CAP Caribbean Webinar series May 2024

Webinar Series Survey Results

- **70%** did not use CAP for dissemination of warnings
- High interest (**83%**) wanted CAP implemented in 2024



Q1 2025 workshops in Dominica, Grenada, Saint Lucia, (CREWS 2.0)

Purpose:

- **Fast-tracking** CAP implementation
- **Mainstream** CAP in operations
- Test CAP editor tool in *WIS 2.0 Box*

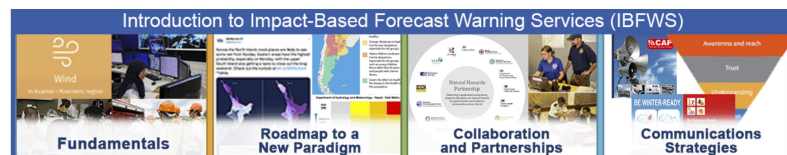
Strengthening Service Capacity Including Marine and Ocean Services



Introduction to Impact-Based Forecast Warning Services (IBFWS)

WMO IBFWS eCourse

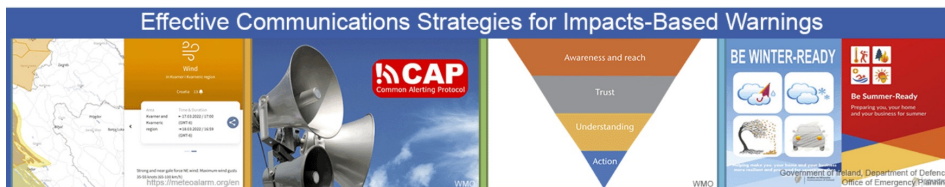
Collapse all



Course Description

How to Take This Course

<https://etrp.wmo.int/course/view.php?id=253>



Road Map for EW4All supports production of IBFWS:

- Provide Members with IBFWS training workshops
- Expand IBFWS eCourse for priority hazards
- Widen warning dissemination tools by implementing CAP
- Integrate e-learning IBF courses and CAP editor tool in WIS 2.0 Box

Thank you Gracias Merci

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