“From Objectives to Action: Strengthening Regional Capacities for Aviation Meteorological Services”

ET-AVI

Raquel Salazar Víquez

Co-chair Expert Team on [RA IV Expert team on Aviation Services (ET-AVI)]

“The RA IV Expert Team on Services for Aviation already has an established structure and coordination mechanisms; the next step is to strengthen regional capacities and translate the progress achieved into concrete results through the collaboration and support of all stakeholders.”

The AVI-TI Expert Team can connect the priority needs of Aeronautical Services with regional actions in training, technical cooperation, and capacity development, promoting practical, sustainable, and results-oriented solutions.

- RA IV members have access to a newsletter that keeps them better informed about aviation meteorology activities and opportunities.
- RA IV experts are coordinated, updated, and have enhanced capabilities to provide aviation services.
- RA IV members are given priority for expert visits and support to improve their aviation services.
- QMS
- RA IV experts coordinate actions to develop and maintain competencies and expertise for providing aviation meteorological services.

What do we do?

1

Monthly meetings

Newsletter

Idea proposal

Coordination with CRF CR

Objective 1:

RA IV members have access to a newsletter that keeps them better informed about aviation meteorology activities and opportunities.

Action taken:

WMO AR IV ET-AVI Bulletin No. 6 – June 2026, and the article “Quality Management Systems” was contributed.

Proposal in progress:

Two articles per year

WMO OMM

Regional Association IV
North America, Central America and the Caribbean
Expert-Team on Aviation Services (ET-AVI)

Newsletter No. 6, June 2026

Spotlight Article

New Term; New Membership Roster

- Raquel Enid SALAZAR VÍQUEZ (Costa Rica) – Co-Lead
- Juan Carlos RAMOS SOTO (Mexico) – Co-Lead
- Cécil MITCHELL – British Caribbean Territories
- Claudine LAROCQUE – Canada
- Alice WOOD – Canada
- Rafael CABRERA CLASE (Dominican Republic)
- Carrie Chapman DUMAS (Trinidad and Tobago)
- Crystol Fayola CAESAR (Trinidad and Tobago)
- Tigahna BACCHUS (Trinidad and Tobago)
- Trevis GARDINER (Trinidad and Tobago)
- Lora WILSON (USA)
- Kristie SMITH (USA)

With appreciated support from:

- Rodney Martinez Guingla (WMO Representative for North America, Central America, and the Caribbean).
- Barbara Tapia Cortes (Technical Coordinator, Services, WMO Regional Office).
- Federico Gomez Delgado (WMO NCAC Office).
- Jose Noboa (WMO NCAC Office).
- Luis Sanchez (ICAO Representative, NACC Regional Office, Mexico City).

Quality Management Systems in Aviation Meteorology at the National Meteorological Institute of Costa Rica

Introduction

Aeronautical meteorology is an important pillar of operational safety and efficiency in aviation. Providing quality services and products in a timely manner is extremely important, given that some of the risks faced by aircraft are directly or indirectly associated with atmospheric events that could influence the decisions of air traffic controllers, pilots, and other stakeholders involved (ICAO, 2018a).

Objective 2:

RA IV experts coordinated, updated, and with enhanced capabilities to provide aviation services.

Action taken:

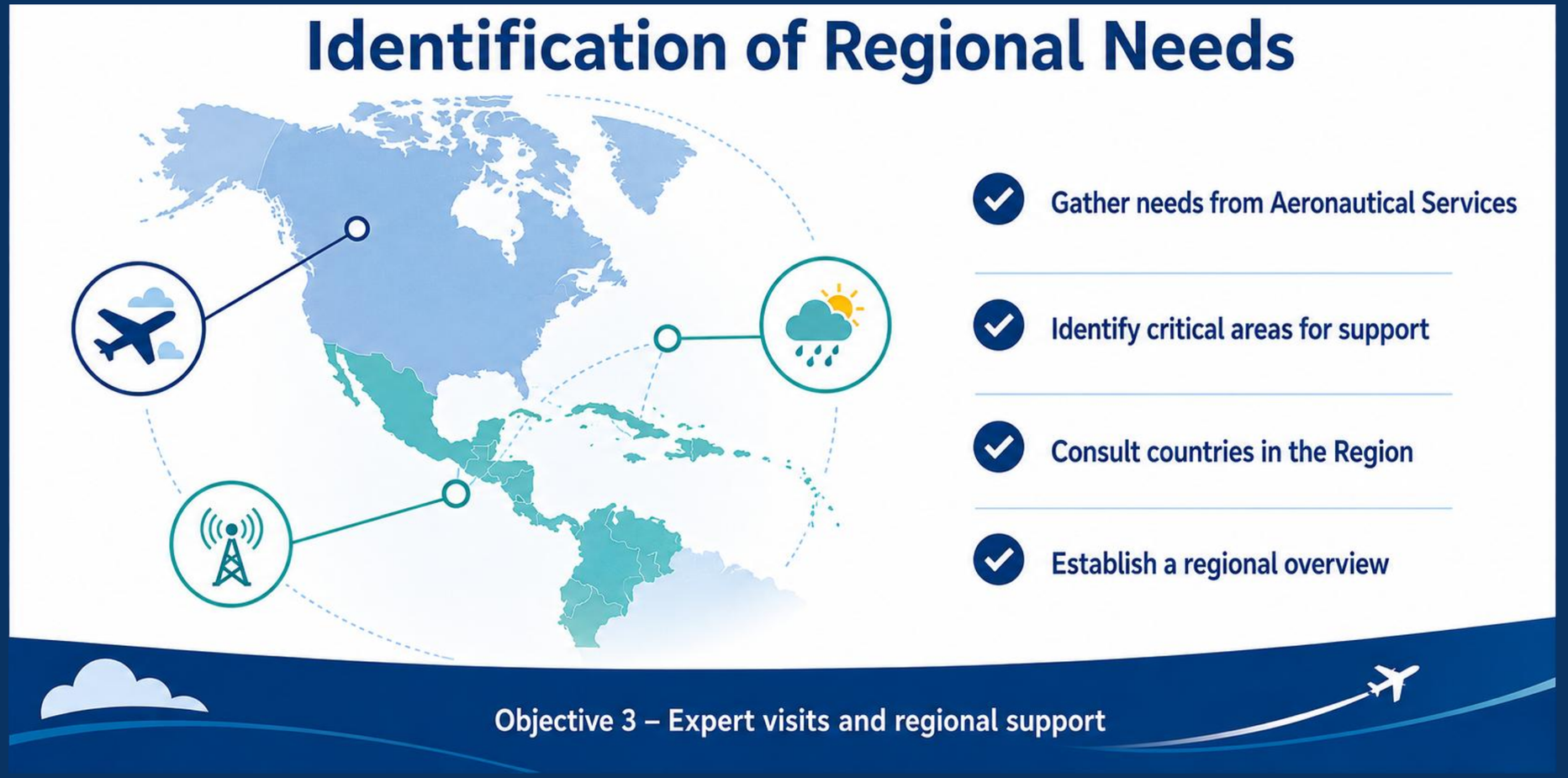
Workshop on severe weather.

Introductory webinar on AI in meteorology.

Future activities 3

Objective 3: Future Proposal

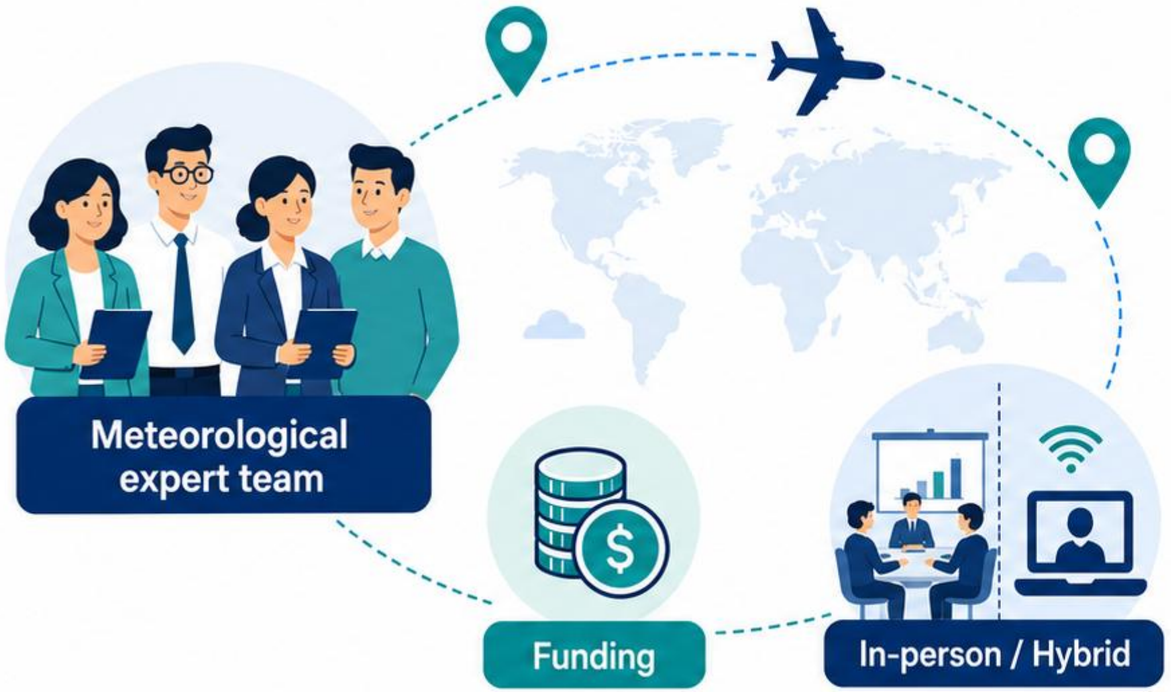
Prioritize RA IV members for expert visits and support to improve their aviation services.



Prioritization of Technical Visits

- Define priority criteria
- Select priority countries or services
- Schedule at least one visit per year
- Address the most urgent needs first

Visit Planning



- Define meteorological experts
- Confirm beneficiary countries
- Secure funding
- Choose in-person or hybrid modality
- Prepare agenda and work plan

Follow-up and Priority Topics

- Follow up after each visit
- Evaluate progress and recommendations
- Strengthen capacities in critical areas

Priority topics:

- SIGMET
- Monitoring
- Forecasting
- Regional communication
- QMS

Objective 4: QMS

Actions taken:

The article “Quality Management Systems” was contributed to the regional newsletter, promoting the dissemination of knowledge and raising awareness about the importance of QMS for the Aeronautical Meteorological Services of RA IV.

ISO 9001:2026 Webinar Programme

Webinar	Proposed topic	Practical application
1	**New ISO 9001:2026 and transition**	Main changes from ISO 9001:2015, updated terminology, transition period and preparation of an initial gap analysis.
2	**Context, interested parties and process approach**	Identification of users and interested parties; definition of the QMS scope; development of the process map of an Aeronautical Meteorological Service.
3	**Leadership, responsibilities and quality culture**	Quality policy and objectives; top management responsibilities; staff roles; strengthening of the quality culture.
4	**Risks, opportunities and planning**	Identification of operational risks; planning of objectives; management of changes and actions to reduce service failures.
5	**Resources, competence, communication and documentation**	Staff competence, training, internal and regional communication, document control, procedures and records.
6	**Operational control of meteorological services for aviation**	Application of the QMS to products and processes such as METAR, TAF, SIGMET, meteorological watch, forecasting, communication and regional coordination.
7	**Evaluation, audit and continual improvement**	Indicators, user satisfaction, internal audits, management review, nonconformities, corrective actions and follow-up.

Regional Training Proposal

Training Programme · WMO Regional Association IV

Courses aligned with the most-voted topics in the training-needs survey (≥ 2 responses)

No.	Programme line	Objective	Target audience	Modality	Expected outcome	Associated WMO topic (survey)
1	**Quality Management Systems in Meteorology**	Implement quality management systems aligned with ISO 9001 and the WMO Strategic Framework in National Meteorological and Hydrological Services (NMHSs).	Coordinators, area managers and quality officers of NMHSs.	Virtual	NMHSs with documented, traceable processes ready for ISO certification.	*Meteorological Data (4) · Other (2)*
2	**Course for Aeronautical Meteorological Observers**	Train aeronautical observers in METAR/SPECI and procedures in accordance with ICAO Annex 3 and WMO recommended practices.	Meteorological observers at airports.	Virtual	Accurate, timely aeronautical observations compliant with the international standard.	*Aeronautical Meteorology (2) · Meteorological Instruments (4)*
3	**Severe weather analysis and forecasting**	Detect, analyze and forecast severe phenomena (thunderstorms, hail, tornadoes, microbursts) using radar, satellite and numerical models.	Operational forecasters and analysts.	Hybrid	More timely, accurate and well-verified severe weather warnings.	*Synoptic Meteorology (2) · Climate Change (5)*
4	**Cold front dynamics and forecasting**	Analyze the dynamics, evolution and regional impacts of cold fronts over Central America, the Caribbean and northern South America.	Forecasters and synoptic meteorologists.	Hybrid	Better forecasting of cold-front-related events: temperatures, rainfall and winds.	*Synoptic Meteorology (2) · Climate Change (5)*
5	**Tropical cyclone analysis and forecasting**	Understand the genesis, evolution, structure and impacts of tropical cyclones in the Atlantic and eastern Pacific basins.	Forecasters and emergency managers.	Hybrid	Greater technical capacity to respond effectively during the hurricane season.	*Tropical Meteorology (3) · Climate Change (5)*
6	**Operational forecasting in tropical latitudes**	Apply modern conceptual and operational forecasting techniques in tropical latitudes, integrating observations, satellite imagery and model output.	Forecasters in tropical and Caribbean countries.	Hybrid	Tropical forecasts that are more reliable, consistent and verified.	*Tropical Meteorology (3) · Meteorological Data (4)*

Training Programme · WMO Regional Association IV

Courses aligned with the most-voted topics in the training-needs survey (≥ 2 responses)

No.	Programme line	Objective	Target audience	Modality	Expected outcome	Associated WMO topic (survey)
7	**Multi-hazard early warning systems**	Design and communicate multi-hazard early warning systems aligned with the Early Warnings for All (EW4All) initiative.	NMHSs, communicators and emergency managers.	Virtual	Timely, clear and actionable warnings that reduce human and material losses.	*Meteorological Communications (3) · Climate Change (5)*
8	**Climate services and climate change adaptation**	Develop climate products and services within the Global Framework for Climate Services (GFCS) and national adaptation plans.	Climatology technicians, climate services coordinators and sectoral liaisons.	Virtual	NMHSs with a portfolio of climate services co-designed with user sectors.	*Climate Change (5) · Meteorological Data (4)*
9	**Applied agrometeorology**	Strengthen the generation of agrometeorological products for planning and risk reduction in the agricultural sector.	Agrometeorologists, NMHS technicians and liaisons with agriculture ministries.	Virtual	Operational agrometeorological bulletins and tools that are useful for farmers.	*Agrometeorology (4) · Climate Change (5)*
10	**Meteorological data management and quality**	Implement best practices in capture, quality control, archiving and publication of meteorological data, aligned with WMO WIS 2.0.	Database technicians and information managers of NMHSs.	Virtual	Reliable, interoperable databases available to internal and external users.	*Meteorological Data (4) · Other (2)*
11	**Operation and maintenance of meteorological instruments**	Train staff in the operation, calibration and preventive maintenance of the surface and upper-air observing network.	Electronics technicians and field observers.	Hybrid	A more stable observing network, with fewer outages and higher-quality data.	*Meteorological Instruments (4) · Meteorological Data (4)*

Strategy to Strengthen Regional Capacities

Course format	Includes	Result
Virtual	Instructors (with extensive experience) Materials Evaluation Certificates Academic support Follow-up.	Structured and measurable training.
In-person	Instructors (with extensive experience) Logistics Materials Laboratories or practical sessions Participant support.	In-depth development of technical skills.
Expert Instructors	Expert identification Fees Technical coordination Module preparation Tutoring or mentoring.	Technical and regional sustainability.
Severe Weather Group Support / Regional Forecast Support Center	Weekly technical sessions Case studies with the region Simulations Tools Coordination workshops.	Direct improvement in operational surveillance and alert capabilities.

CONSOLIDATED PROGRAM SUMMARY

Comparison of the 4 programs. Modifiable parameters

#	Program	Type of Program	Number of Persons	Fees (excluding VAT)	Instructor Per Diem	Participant Per Diem	Total Per Diem	TOTAL A Without fees (including VAT)	TOTAL B With fees (including VAT)
1	**1. QMS in Meteorology**	Virtual	18	$2 812,50	$0,00	$0,00	$0,00	$0,00	$3 178,13
2	**2. (CMAO) Course for Aeronautical observers**	Virtual	18	$10 000,00	$0,00	$0,00	$0,00	$0,00	$11 300,00
3	**3. Cold Front (Oct)**	Presencial	14	$0,00	$0,00	$23 100,00	$23 100,00	$26 103,00	$26 103,00
4	**4. Tropical cyclones (Jun)**	Presencial	14	$0,00	$6 600,00	$23 100,00	$29 700,00	$33 561,00	$33 561,00
	GRAND TOTAL (USD)			**$12 812,50**	**$6 600,00**	**$46 200,00**	**$52 800,00**	**$59 664,00**	**$74 142,13**

“Supporting the strengthening of these initiatives represents an opportunity to expand regional capacity, promote higher-quality meteorological services, and contribute to safer and more efficient aviation.”