

## **Education and Training Programme activities 2019 – 2023**

### **- highlights -**

#### **Introduction**

The importance of Education and Training was reiterated in Resolution 71 (Cg-18), which decided that the Education and Training Programme (ETRP) should be directed toward developing qualified and competent NMHS staff. It should do this by ensuring the availability of quality education and training opportunities in collaboration with education and training providers at national and international levels.

The Education and Training Office establishes operational plans aligned with the WMO Strategic Plan, with the advice of the EC-CDP, and in cooperation with all the departments and offices of the Secretariat.

The goal of the Education and Training Programme is to enhance the contributions of WMO to the attainment of vision 2030 by assisting NMHSs in their development and delivery of high-quality, initial, and ongoing education and training of staff for improved delivery of products and services in meteorology, hydrology, climatology, and related environmental disciplines, with due attention to their development status.

The Education and Training Office was involved as an organizer or contributor in a large number and variety of education and training activities. Also, the Education and Training Office was directly involved in coordination, know-how, and financial and technical support in training events delivered in collaboration with among others, Marine, QMS, Aviation, Hydrology, and Climatology departments. International training needs were identified using surveys and the most recent Education and Training publications as support to identifying these needs.

Considering the above, Education and Training Programme is focused on the following:

1. Obtaining and maintaining continuous development of competencies
2. Enhancement of training capabilities of institutions and experts
3. Development of leadership and management capabilities of NMHSs
4. Assessment of new and emerging learning needs and capacity of NMHSs
5. Supporting technical departments of Secretariat in their training activities
6. Enhancement of collaboration between education and training institutions

Education and Training Programme started preparing trainers in advance by delivering modules in the Train the Trainers courses dedicated to distance learning. Unfortunately, the efforts were insufficient to mitigate the impact on education and training providers. All education and training activities were fundamentally affected by the COVID pandemic.

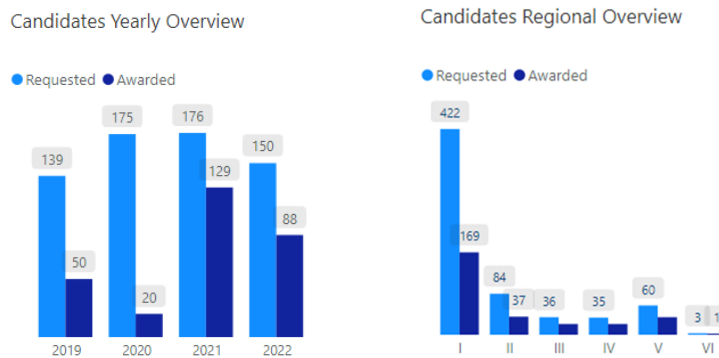
## Education and Training activities

### Fellowships and group training activities:

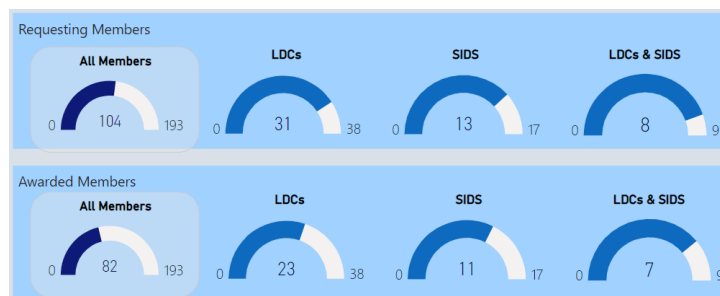
The WMO Fellowship Programme aims to support the education and training of qualified and suitable candidates for WMO Members, particularly from least developed (LDCs) and developing countries and small island developing states (SIDS), to enhance the capabilities of their National Meteorological and Hydrological Services (NMHSs).

The Fellowship Program is structured in three components: Fellowships, Group Training, and Familiarization Visits.

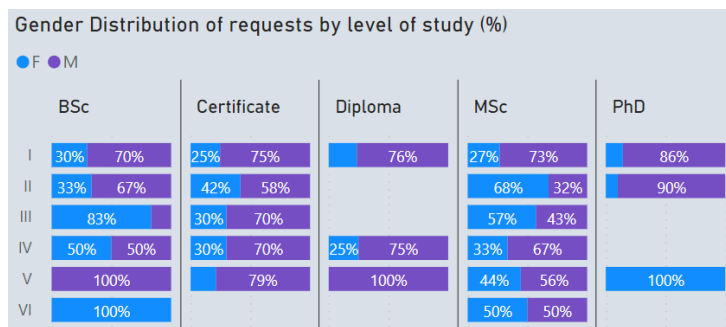
As can be observed in the graph, the number of awards was reduced during the COVID pandemic dramatically in 2019-2020, even if the requests continued to grow. Following the adaption to distance learning, Education and Training activities were revamped starting with 2021. Participation in education and training events was affected in 2022 by the impossibility of proper planning due to the uncertainty of the pandemic evolution.



The interest shown by the LDCs and SIDSs in education and training events can be easily observed in the graphics of the requesting and awarded fellowships per WMO Members.



Distribution of fellowship requests by gender in each region shows continuous disparities in requests, which can be observed mainly for group fellowships (Certificate and Diploma) and PhD studies.

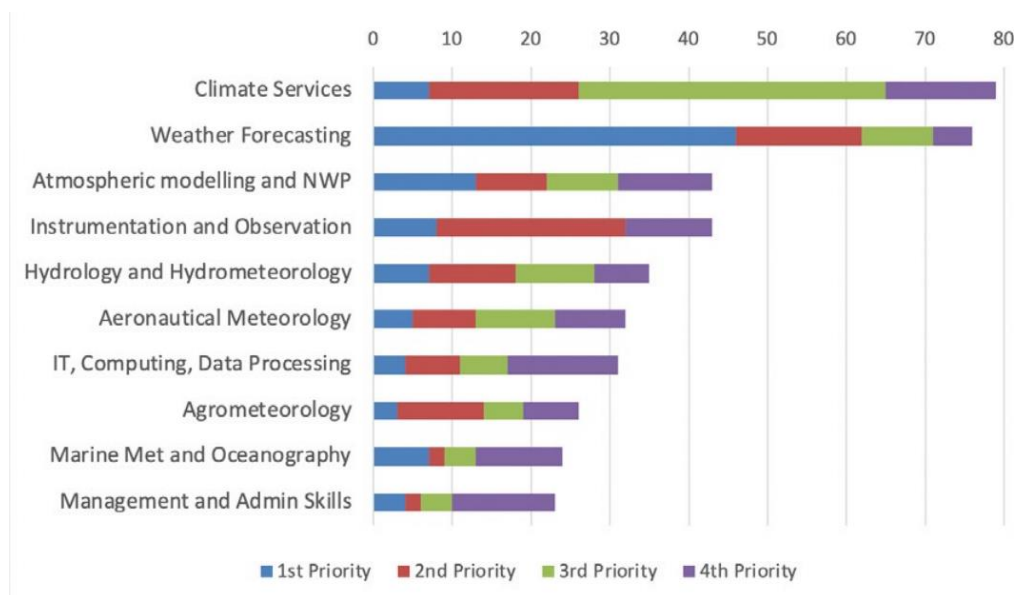


### **Familiarization visits**

As expected, this extremely important activity was reduced dramatically between 2019 and 2023. Considering the impact on the activities of the NMHSs, the Education and Training Office managed to organize online induction events for the newly appointed Permanent Representatives to cover at least partially the needs of the Members. Before and after the restrictions,

*Even with the restrictions associated with the difficult period, the total number of awarded fellowships was 284, with an average of 70 awards/per year.*

### **Training events: online, blended, and in-person courses**



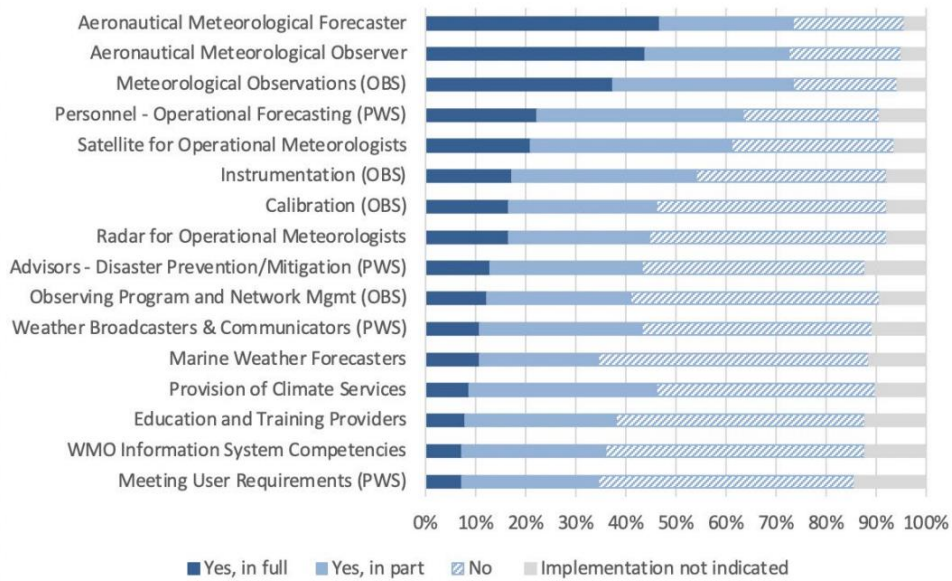
Training priorities, according to the 2021 survey

Even through coordinated efforts of the Education and Training Office and specialized WMO Departments, the latest survey results (2021) show that there are still more requirements than the training offered, and a reorientation to competency-based training is needed.

Professional category	Region						Global
	I	II	III	IV	V	VI	
Met Tech	2 505	31 584	726	262	195	813	36 085
Manager	444	19 248	106	674	132	165	20 769
Climatologist	297	11 112	66	93	141	110	11 819
Meteorologist	1 295	4 706	299	2 363	502	746	9 911
Researcher	240	5 186	33	13	46	276	5 794
Support Staff	1 192	963	273	1 259	150	528	4 365
Hydrologist	170	58	94	292	18	90	722
Customer/Comms	198	96	46	81	50	97	568
Totals	6 341	72 953	1 643	5 037	1 234	2 825	90 033

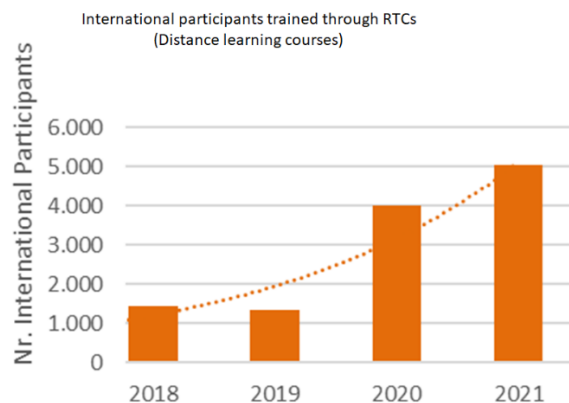
Training needs, according to the 2021 survey

Regarding competency implementation, the statistic reveals that the percentage is still small even for domains in which the competency approach is compulsory for several years.



The rate of competency implementation, according to the 2021 survey

The evolution of training events in the intersession period evolved from predominant in-person activities in 2019 to fully online in 2021 and with a reorientation in 2022 to blended courses with combined online and in-person components. This is considered an excellent approach in terms of cost-effectiveness and learning efficiency.



### ***On the Job Trainers and Competency Assessors Courses***

To cover the need for competency-based training, a series of new courses, focused on obtaining competencies as On-the-Job Trainers and Competency Assessors was initiated in 2022, and already delivered in RA I (sessions in French and English languages), RA VI (English language) and RA III/IV (English language) with a total of 102 participants

### ***Support to Leadership and Management Development***

Leadership and management development skills are essential to the development of all NMHSs, even more so in today's rapidly changing and broadening roles for NMHSs. In recognition of the need to pay more attention to the development of leadership and management skill nowadays, with a view of putting NMHSs on better footing for the challenges ahead, the Eighteenth World Meteorological Congress identified leadership and management as priority areas for capacity development of NMHSs.

Following this concept, a series of courses were delivered:

- November 2019, 55 Participants from 41 RA-I Members, out of which 32 Permanent Representatives
- August 2021 (online, collab. Singapore) attended 23 senior officials from the 6 RAs, including 4 PRs.
- November 2021 (online, collab. AEMET) focused on Ibero-American Senior Managers, 25 participants from 14 Ibero-American Members
- March 2022 (webinars, collab. with UKMO), 41 participants from 29 Member states

In 2021, a total of 901 trainees were supported to participate in short-term courses: almost double compared to 2020 and three times more than in 2019 due to the shift to distance learning. In 2022 were supported a record number of 1215 participants in 44 short-term training events.

Between 2019 and 2022, Education and Training Programme supported 2840 trainees in 112 training events.

### **Enhancing and sustaining capability of WMO Regional Training centers (RTCs)**

The challenge for the Education and Training Programme, the RTCs, and the WMO Members is to make the most of the advantages of distance and face-to-face learning within the financial and human limitations of training providers and the demand for education and training. There are 28 WMO Regional Training Centres, composed of 43 components, providing a diverse portfolio of education and training opportunities through residence classes, with in-person, distance, and blended learning.

All RTCs are reviewed every eight years to ensure the level of education and training delivered, to provide opportunities for development, to identify the needed support, and to create a broad image of the impact of the RTCs in the regions and globally.

Between 2019 and 2022, the RTC reviews were difficult to be concluded, and some activities had to be postponed or extended.

Review	RTC	Last Review
Completed in 2022	Russian Federation	September 2019
	India	February 2020
	Italy	May 2022
Ongoing in 2023	Turkey	June 2022
	Indonesia	December 2022
	Costa Rica	April 2017 – rescheduled
Planned in 2023	Israel	December 2013
	Peru	Not Reviewed yet
	Niger	November 2014
	Korea	Not Reviewed yet
	China	April 2011

2024	Brazil	February 2015
	Iran	August 2016
	Barbados	May-December 2016
	Argentina	November 2016
2025	Algeria	December 2017
	Spain	Not Reviewed yet
	Madagascar	October 2018
	Kenya	April 2018
2026	Philippines	December 2018
	Nigeria	July 2018
	South Africa	September 2018
	Qatar	April-May 2018
2027	Egypt	December 2018
	Uzbekistan	October 2019
	Iraq	Designated in 1976 never Reviewed
	Venezuela	March 2005
	Angola	July 2006

In 2022 were finalized two RTC reviews for reconfirmation, and some other three were conducted and finalized. Due to the evolution of the local context, one of the RTCs has been rescheduled for 2023

A preliminary assessment for designating an RTC in Cameroon was conducted in 2023 to identify the potential, considering the need for education and training in Central Africa.

## **Support to Policy Development and Collaboration**

### ***Capacity Development Panel (CDP) Meetings***

The CDP of the Executive Council (EC), hereinafter the Panel, was established in 2019 by [Resolution-7 \(EC-71\)](#). The panel's first meeting was held in August 2020, marking the start of its work. In its first session, the Panel established four Expert Teams (ET) and one Task Team (TT) to assist with work under the responsibility appointed to the Panel.

Seven remote or in-person meetings were supported through the Education and Training Programme, and as a result of the activities since its inception, the Report of the CDP Chair on the Activities of the Capacity Development Panel to the EC-76 contained a total of 27 recommendations as a result of the actions conducted between 2020 and 2023. Beyond the recommendations, the WMO Capacity Development Strategy is submitted for approval.

### ***Responding to Challenges Beyond the New Normal: A Global Campus Event***

The Collaborative Webinar "Responding to Challenges Beyond the New Normal", a WMO Global Campus Event, was organized from 20 to 22 January 2021 in which attended 175 participants from 33 countries.



COVID-19 challenges were the subject of major debates during the event, which discussed, amongst others, the problems encountered by the participants during the pandemic. The dramatic changes from in-person education and training to distance delivery created a lot of issues for the specialized institutions in terms of preparedness for changes in the education act, financial and organizational impact, and the benefits and disadvantages of the new approaches. Some of the challenges can be summarized as follows:

- Postponements of programmes and increases in unmet needs
- Challenges to institutions and students in online learning, including computer and internet access, language, and unfamiliarity with the delivery mode
- Fellows are deprived of opportunities to benefit from other curricular and extracurricular activities important for intellectual and emotional development
- Networking opportunities are reduced, even if opportunities can be explicitly built into online course designs
- Challenges on how to influence the content of curricula of host institutions and to recommend external advisors

### **SYMET-14**

The Symposiums on Education and Training (SYMET) are organized by the Education and Training Office once every four years to assist the international community in meeting current meteorological and hydrological education and training challenges and those that are foreseen to arise over the next five to ten years. In 2021, the theme of SYMET-14 was "Education and Training in a Period of Rapid Change", chosen to emphasize, among others, the challenges in confronting the rapidly progressing technology, service delivery expectations, globalization of the meteorological enterprise, growth in urban environments, and impacts of climate change. The Symposium attended 253 participants, representing 61 Members from all WMO RAs and also 60-70 representing training partners.

The [SYMET-14 Statement](#) was approved by participants on the symposium's final day. It conveyed key observations and recommendations to policymakers and governments, the WMO and other international organizations, and to the education and training community.



## ***Development of Educational Resources***

[Developing Meteorological and Hydrological Services through WMO Education and Training Opportunities \(ETR-25\)](#) The publication contains an evaluation carried out to review the performance of the fellowship programme, particularly its impact on and benefit to the Members and on how it can be delivered in a more sustainable way. The evaluation, approach and criteria were based on the norms and standards of the United Nations Evaluation Group (UNEG)

[Training Materials and Best Practices for Chemical Weather/Air Quality Forecasting \(ETR-26\)](#). The publication has been developed by some 80 experts on numerical weather prediction, air quality forecasting, anthropogenic and natural emissions (including wildfires, dust storms, air toxics, and volcanic eruptions), data assimilation, as well as ensemble and probabilistic forecasting. It contains a review of existing worldwide research and development experience and real-time CW-AQF, incorporates existing education materials, recommendations, and best practices in recognized meteorological training institutions, and identifies the critical needs for management competence enhancement in CW-AQF.

in four volumes, [Global Campus Innovations \(ETR-27\)](#) was developed as an answer to the Eighteenth World Meteorological Congress Decision to support the WMO Global Campus initiative to promote collaboration, cooperation, and sharing among the many education and training institutions. The contained papers represent innovations growing within the small community that includes educators and trainers preparing learners to work in meteorology, hydrology, climate services, and related fields, as well as the communities that these professionals serve.

[Impact of Training Programme on Climate Change Adaptation and Disaster Risk Reduction in Agriculture report \(ETR-28\)](#). The evaluation was conducted to measure the project's long-term impacts, focusing on how participants used new knowledge and skills and improvements in individual and organizational performance.

The various chapters of the [Primer on Public Policy and Management with reference to Meteorological Services \(WMO-No. 1289\)](#) are based on presentations delivered in three workshops at the Lee Kuan Yew School of Public Policy - National University of Singapore between 2018 and 2021. The Meteorological Services Singapore and the World Meteorological Organisation sponsored these workshops. These workshops and this publication aim to convey content on concepts and methods of public policy and management to professionals engaged in Meteorological Services. The volume consists of four parts: Public Management, Results and Evidence-based Public Management, Economics and Public Management, and Communication. The first part deals with a Volatile Uncertain Complex and Ambiguous (VUCA) world. Apart from assembling results and evidence, the second part also includes postulating pertinent scenarios. The third part deals with economics management based on economic efficiency, behavioral insights, and environmental and social capital. The final part highlights the importance of effective communication



[Education and Training in a Period of Rapid Change: Highlights of the Fourteenth WMO Symposium on Education and Training \(WMO-No. 1291\)](#) explores the importance of discussing the challenges and opportunities of education and training in a period of rapid change. This was the main theme of the Fourteenth WMO Symposium of Education and Training (SYMET-14), and this document summarizes the main conclusions and recommendations from SYMET-14, including the Statement agreed by the participants on the final day of the Symposium.

The WMO's seventh [Survey on the status of human resources in National Meteorological and Hydrological Services: Staff, Competencies and Qualifications \(WMO-No. 1305\)](#), conducted from 2021 to 2022, reiterated the previous survey's investigation of staffing patterns and added inquiry concerning qualifications and competencies. The report presents detailed survey results in two parts: Staffing and Capacity Development: numbers of experts needing to be trained, fellowship priorities, training priority areas, completion rates for the BIP-M frameworks, and implementation and assessment rates concerning the sixteen WMO competency standards. Survey results are presented for the global respondent group, as well as for each of the six WMO Regions. The report sheds particular light on progress in gender equity and needed emphasis on climate services and knowledge transfer.

### ***The Global Campus Initiative***



In 2019, the Eighteenth World Meteorological Congress endorsed the WMO Global Campus initiative to promote collaboration, cooperation and sharing of experiences among education and training institutions as one important way to increase education and training capacity to meet the needs of all WMO Members. It was recognized that only through increased collaboration it would be possible to bridge the gaps. Sharing experiences in implementing innovations in education and training is one of the original aims of the WMO Global Campus initiative. In this respect, some elements need to be highlighted:

- Through the Global Campus Initiative, more than 740 education and training resources were shared
- Global Campus Library is maintained and updated with contributions from the members
- [Global Campus Events Calendar](#) is continuously populated with training events and consulted by Members
- A Collaborative Webinar WMO Global Campus Event was organized on "Responding to Challenges Beyond the New Normal" from 20 to 22 January 2021; 175 participants from 33 countries attended.

### ***CONNECT (Consortium of WMO Education and Training Collaborating Partners)***

The concept of the Consortium of WMO Education and Training Collaborating Partners (CONNECT) stems in part from the WMO Global Campus initiative, which is based upon WMO's tried and tested practice of linking Members' existing facilities to create a

coordinated, distributed network from the existing specialist WMO-related education and training institutions.

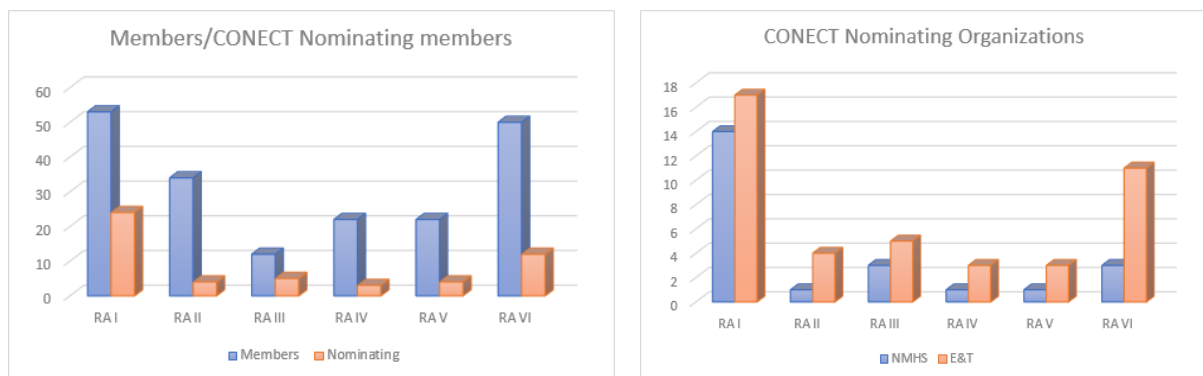
The Concept of establishing CONECT as an entity to complement the work of the WMO Executive Council Capacity Development Panel (EC-CDP) will assist in building a critical mass of support for ensuring technically sound, coherent, consistent, and timely input of stakeholders toward the provision of desirable strategic direction for education and training activities in meteorology, hydrology, and related environmental disciplines.

Consequently, it will constitute viable ground for minimizing duplication, complementing efforts, maximizing impacts, and enhancing the cost-effective use of resources.

Complementary to the overall benefits to Members from enhanced capacity and competence expected from the WMO Global Campus, CONECT will bring additional benefits as:

- Increasing communication at global and regional levels and with EC-CDP and Education and Training Programme regarding regional and thematic training needs;
- Identifying innovative training solutions that can be adopted by all partners, contributing to closing the gap of capacity development among Members;
- Identifying training resources that can be shared and localized for use in different Regions;
- Sharing ideas and viable solutions to challenges in education and training.

The global-wide interest in CONECT is revealed by the large participation of the members and the wide variety of nominated participants. As of March 2023, a total number of 100 nominations were received by the Secretariat. Based on the nominations, it can be observed that a lot of NMHSs have nominated participants, showing a high interest in coordinating efforts and increasing communication between service providers on one side and education and training providers on the other.



### Planned Education and Training Programme activities

The Education and Training Programme is continuously making efforts in organizing and supporting training, based on the needs identified in the surveys, events as SYMET-14, and communication with the WMO Regions. Below is a highlight of the activities planned for 2023, directly connected to capacity development and the focused approach in developing competencies.

- The list of Universities delivering fellowships will be extended. The Secretariat is trying to identify new opportunities and negotiating to expand the educational offers.

- The Education and Training Office is assessing the opportunities for new RTCs in the regions in need and finding the means of revamping the ones with reduced activities
- The review of the Guide on Management and Operations of RTCs will change the approach by working on the processes related to the designation and reconfirmation of RTCs.

### ***Publications and reports in the pipeline***

To keep pace with the needs and evolution in education and training, and following the WMO Reform impact, some documents need to be reviewed and updated. The Education and Training Office is working in 2023 on the review and revision of the following documents:

- Reference guide for Permanent Representatives of Members with WMO (WMO-No. 939)
- Guidelines for Trainers in Meteorological, Hydrological and Climate Services (WMO-No. 1114)
- Guide on Management and Operations of RTCs (WMO-1169)
- Guidelines on the Role, Operation and Management of NMHSs (WMO No.1195)
- Guide to Competency (WMO-1205)
- Compendium of WMO Competency frameworks (WMO-No. 1209)
- Guidelines to apply for a WMO Fellowship (WMO-1104)
- Manual on Policies and Procedures for WMO Fellowships (ETR-18)
- Publication of the Fellowships 10-year Overview

### ***Areas in training for 2023 (extract)***

The dynamic of the training events is very high in 2023 due to financial limitations and requests from the WMO Members. Considering this dynamic, the list below is continuously updated:

- Train the Trainers courses and courses focused on obtaining competencies as On-the-Job Trainers and Competency Assessors as fundamental elements in competency implementation.
- Focused training on satellite meteorology on specifics related to Early Warning Systems needs: in 2023 Education and Training office is collaborating in the delivery of this new approach to Marine services.
- Specific training dedicated to hazards, such as sand and dust storms, supporting the program Early Warnings for All.
- Extensive support to competency-focused training in hydrology by coordinating hands-on courses for RA I and III in different languages.
- Courses dedicated to competency implementation for Climate Services.
- Communicating information to the users course as an important ingredient in the Early Warning for All Program implementation.
- Competency development courses include forecaster competency, use of Numerical Weather Products, and hazardous weather forecasting, focused on impact-based forecasting as a component of the Early Warning for All program.
- Leadership and Management programs will continue and will be evolving in terms of content based on each course experience.

