

# Education and Training Office

- Input to GDPFS -



WMO OMM

World Meteorological Organization  
Organisation météorologique mondiale

## GOAL of ETR Programme 2020-2023

Enhance 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.





## Products and Services

Continuously developed modelling

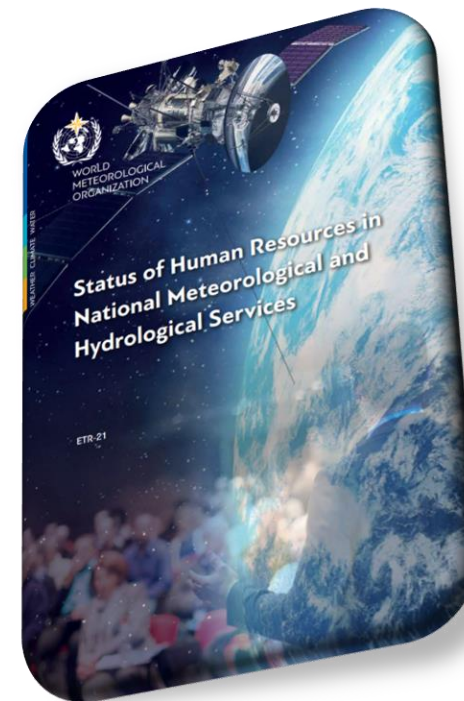
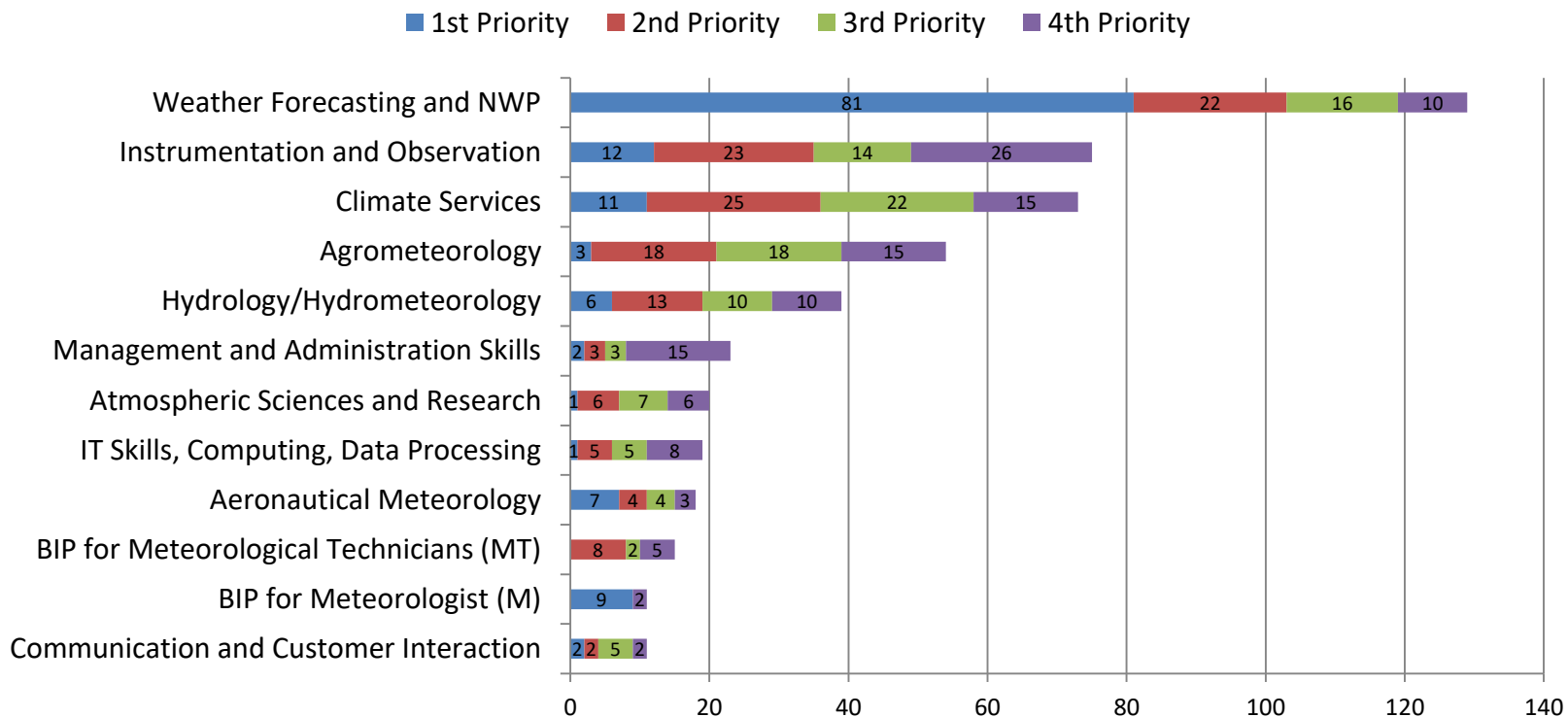
Technical support

**Human factors**



# ETR Surveys and results

Surveys conducted globally were an overarching tool to identify the education and training needs of the Members directly. Also, using the surveys has assessed regional and national challenges in education and training.



# Education and Training Program Instruments

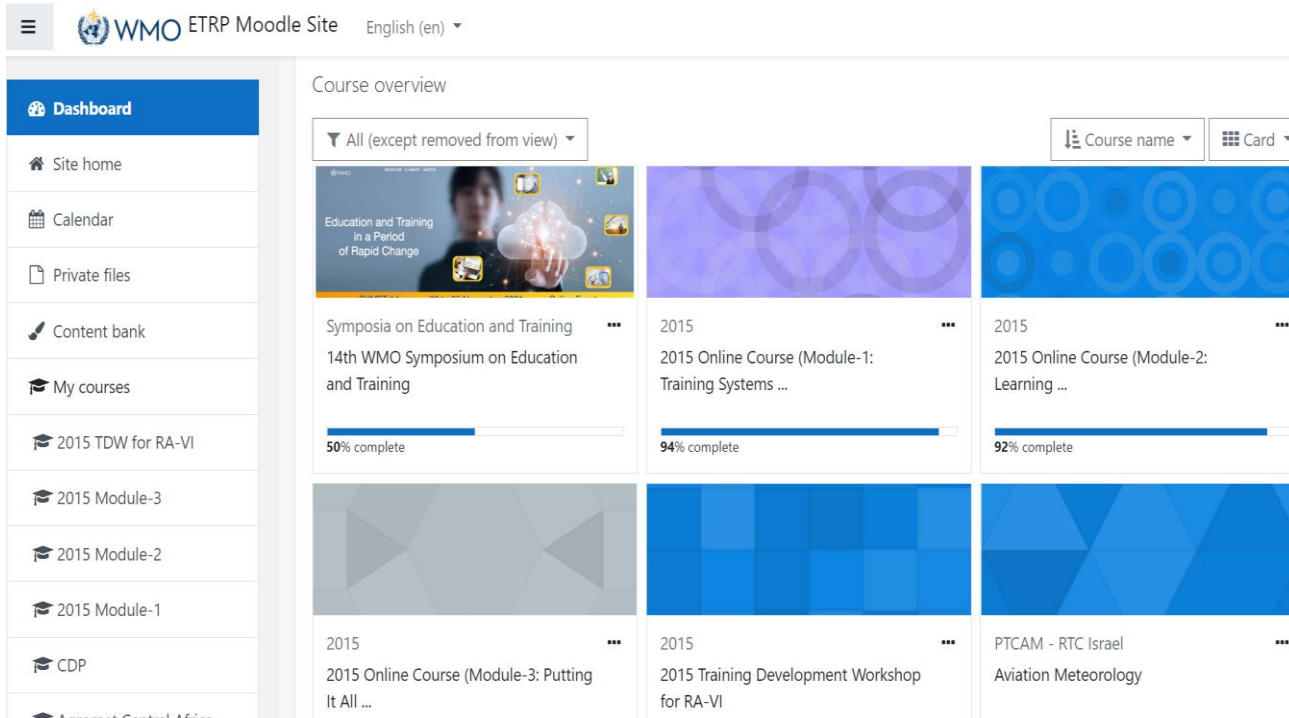


1. Fellowships for experts from LDCs and SIDS to achieve qualifications
2. Continuing professional development through training activities in line with WMO guidance
3. Development of education and training resources
4. Provision of advisory services, particularly to WMO Regional Training Centres and other core education and training partners
5. Periodic, global and regional surveys and analyses of the resulting data
6. Support to WMO Secretariat Technical Departments in design and development of training materials and delivery of training activities
7. Promotion of collaboration through the WMO Global campus initiative



## Education and Training support maintained by ETR

**ETRP Moodle site** has become an essential tool not only for delivering distance learning and a repository for education and training resources but also an outstanding contingency instrument for training delivery during pandemics.



The screenshot shows the 'Course overview' page of the WMO ETRP Moodle Site. The page features a sidebar with navigation options: Dashboard, Site home, Calendar, Private files, Content bank, My courses, 2015 TDW for RA-VI, 2015 Module-3, 2015 Module-2, 2015 Module-1, CDP, and Agromet Central Africa. The main content area displays a grid of course cards. The first card is titled 'Symposia on Education and Training' and shows '14th WMO Symposium on Education and Training' with a 50% completion bar. The second card is titled '2015 Online Course (Module-1: Training Systems ...)' with a 94% completion bar. The third card is titled '2015 Online Course (Module-2: Learning ...)' with a 92% completion bar. Below these are three more cards: '2015 Online Course (Module-3: Putting It All ...)', '2015 Training Development Workshop for RA-VI', and 'PTCAM - RTC Israel Aviation Meteorology'. The page includes a search filter 'All (except removed from view)', sorting options 'Course name' and 'Card', and a language dropdown set to 'English (en)'.

The use of ETRP Moodle was extended from the beginning to sharing reusable resources between RTC training programs and an opportunity to virtually exchange trainers between RTCs and between RTCs and other training providers.

*ETR is also giving all necessary support to Members and RTCs in the use of Moodle for training activities*



# ETR focus areas and actions

The specific activities of the ETR Office evolve with the changing needs expressed by the Secretariat, Technical Commissions, Research Board and Regional Associations, as well as those proposed by funding partners. The activities of the ETR Office tend to focus on the following areas:

## **Capacity development through education and training**

- Hosting the Symposia on Education and Training (SYMET) and Meetings of Directors of RTCs and other training partners and incorporating the resulting recommendations into potential programme activities
- Assessing and responding to the present and future needs of Members for educated and trained personnel, particularly as derived from the regularly conducted survey of Members and outcomes published as Status of Human Resources in NMHSs
- Acting as the interface between NMHSs and the international meteorological and hydrological education and training community
- Helping to share successful experiences in education and training through courses for trainers, publications, and other methods
- Facilitating access to training materials and instructors
- Hosting, co-hosting and advising on training activities intended to meet WMO goals and strategic objectives
- Organizing management development opportunities and familiarisation visits/study tours for senior personnel



# ETR focus areas and actions

## Fellowships

- Coordinating the granting of education and training fellowships that develop the qualifications of personnel through medium and long-term individual and group training programmes



## Other activities:

- Develop leadership and management competencies in NMHSs
- Coordinate the development and review of standards and requirements for the education and training of meteorologists, meteorological technicians, hydrologists, hydrological technicians, and climate services experts in line with changing international regulations, and technical, educational and societal demands
- Developing guidance material on education and training practices, including the competency approaches
- Coordinating the WMO Global Campus Initiative
- Coordinating the designation and reconfirmation processes for RTCs.

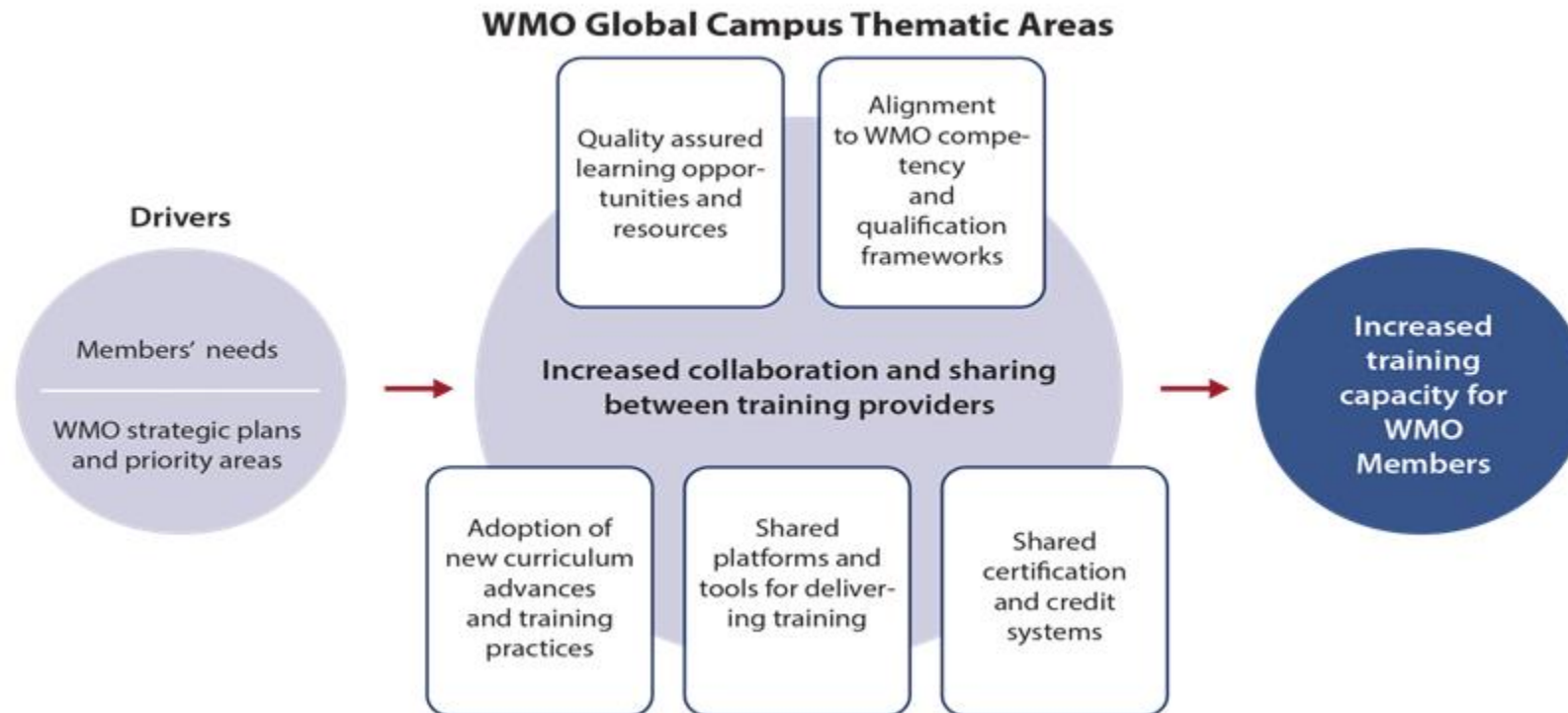




# ETR and the Education and Training providers

## Global Campus initiative

A network of institutions coordinating and collaborating to offer increased education and training opportunities for WMO members.



# ETR and the Education and Training providers

## Global Campus initiative



# Consortium of WMO Education and Training Partners (CONNECT)

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

Increasing **communication** at global and regional levels and with EC-CDP and ETR 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.



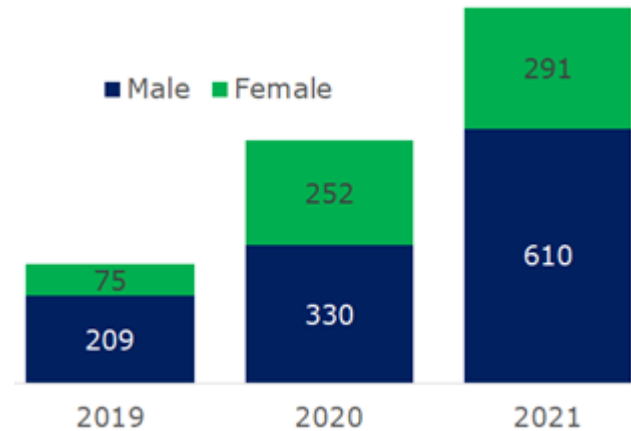
# Education and Training events organised by ETR

**901 WMO-supported trainees** participating in 2021 at short-term courses: almost double compared to 2020 and three times more than in 2019 due to the shift to distance learning

**Group training on numerical weather prediction:** 4 RTCs successfully run the first online phase. Face to face phase is planned to take place in Q3/4 2022 and Q1 2023

- RTC Indonesia: 38 participants from 14 NHMSs in RA-I, II and V from 20 May to 2 July 2021
- RTC Egypt: 43 participants from 13 NHMSs in RA-I and II from 4 October to 11 November 2021
- RTC Algeria: 39 participants from 13 NHMSs in RA-I from 11 October to 18 November 2021
- RTC India: 27 participants from 13 NHMSs in RA-I, II, III and V from 4 October to 11 November 2021

**Blended Training Course for Weather Forecasting** opened virtually on 1 February 2022, hosted by WMO RTC South Africa. The online phase will last until August 2022. The face-to-face part will run from September until November 2022.



# Education and Training events organised by ETR

## NWP Course in India – content extract

- Applications of an operational Variational assimilation scheme in numerical weather prediction (shallow water model). Radar & Satellite Data assimilation,
- Pre-processing of observations, Configuration of WRF model with GFS,
- Graphics package for illustration of NWP products,
- Use of model verification tool MET. Model outputs verification tools/ post-processing: Exercises based on the Verification packages such as MET, MODE, R, etc. Visualization of model outputs based on graphic packages such as VAPOR, NCL and RIP.
- Computation of time evolution of Zonal and eddy kinetic and available potential energy and their inter conversion, using forecast field

## NWP Course in Indonesia – content extract

- Introduction to NWP Application
- Ubuntu Linux System Operation
- NWP Basic
- Consortium for Small-scale Modeling (COSMO)
- Ubuntu Linux System Operation
- Weather Research and Forecasting (WRF) Model
- Post-Processing Application and Visualization
- Verification Techniques
- WRF Simulation in High Performance Computing (HPC)
- Advance WRF Model
- Ocean Model
- Climate Model
- Application on NWP products in BMKG Daily Weather Forecast (Practical Session)



# Education and Training events organised by ETR

## NWP Course in Algeria – content extract

The course is divided into two parts namely:

- The first part was theoretical, in which the basic notions necessary for the understanding of different schemes of numerical integration and physical parameterization were presented.
- The second part is will be dedicated to the implementation of the WRF model (open source model) and the realization of several numerical simulations, allowing a good familiarization with the different codes used in the numerical models as well as the techniques of physical parameterization

## NWP Course in Egypt – content extract

- Atmospheric observing system
- Numerical Methods and forecasting models
- Meteorological Data Format and Processing
- Data assimilation and NWP parameterizations
- NWP parameterizations (Physical, Convective, Radiation, etc.)
- Weather Research and Forecasting (WRF) Model
- WRF Post-Processing Application and Visualization



## Education and Training events organised by ETR

Successful programs continuously updated in terms of content and delivery

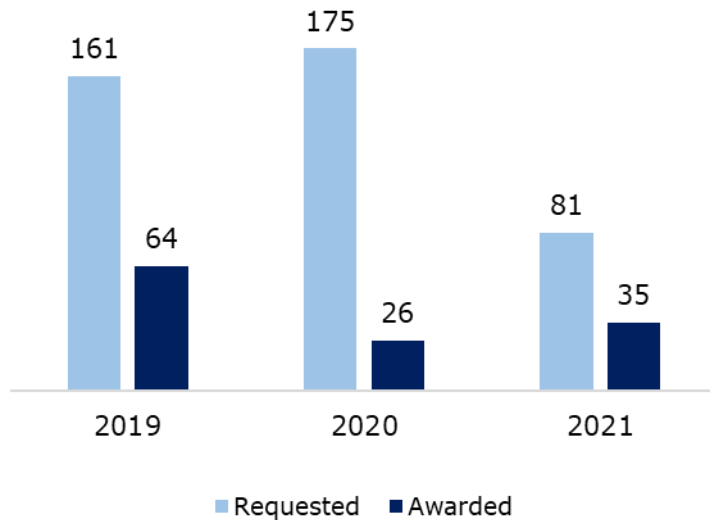
- Train the Trainer courses delivered in English, French, Russian and Spanish languages
- New modules dedicated to Train the On-the Job Trainers and Competency assessors are being developed



# Education and Training events organised by ETR

**Long-term Fellowships** are awarded at 13 prestigious education and training providers from 10 Member States around the globe.

**33 fellows in 2021:** 25 newly approved in 2021 + 8 deferred from 2020



Number of requested versus awarded fellowships

WMO Fellowship Partners

1.1	China	China Scholarship Council
1.2	China	Nanjing University of Information Science and Technology (NUIST)
1.3	China	Hohai University
2	France	Ecole Nationale de la Météorologie (ENM)
3	Germany	Leibniz Universität Hannover (LUH)
4	Republic of Korea	Ewha Womans University (EWU)
5	The Netherlands	IHE Delft, Institute for Water Education
6	Russian Federation	Russian State Hydrometeorological University (RSHU)
7.1	United Kingdom	University of Reading
7.2	United Kingdom	European Centre for Medium Range Weather Forecast (ECMWF)
8	United States of America	National Oceanic and Atmospheric Administration (NOAA)
9	Italy	The World Academy of Sciences (TWAS)
10	Argentina	Universidad Nacional del Litoral (UNL)





# Education and Training events to which ETR contributed

Training package on "[Strengthening the Delivery of Global and Regional Climate Services](#)" was focused on providing training resources to assist closing the gaps in Member's ability to deliver climate services

Self-directed learning course "[Introduction to Climpact: Generating Climate Indices to Support Climate Services](#)"

2 webinars on the delivery of climate services

- Integrating Climate Risk Information into Climate Action: 207 participants from 51 countries
- Supporting Climate Action Through Climate Indices: 199 participants from 43 countries

Climate Adaptation Workshop (ClimAdapt) Workshop (online, 8 to 19 November 2021):

- 21 participants from India, Iran, Nigeria and South Africa

Climpact Workshop (online, 17 to 28 January 2022):

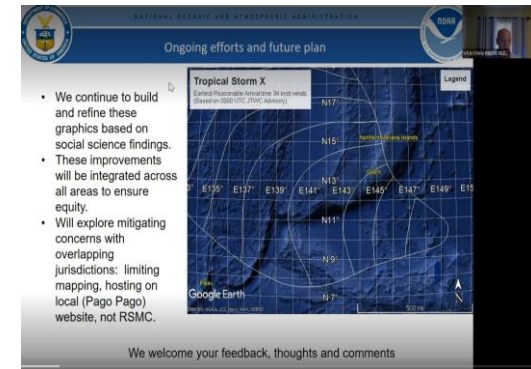
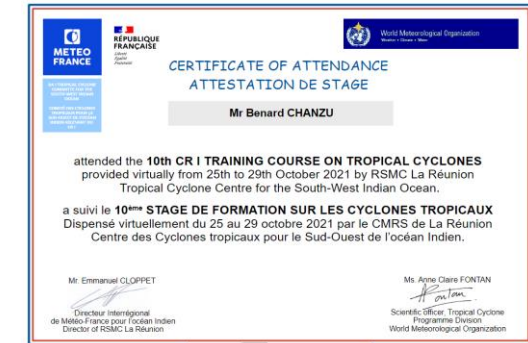
- 21 participants from India, Iran, Nigeria, South Africa, Nepal and Myanmar.



## Education and Training events to which ETR contributed

Tropical Cyclone forecasting, warning, related hazards and messaging: 123 experts trained in 3 online events:

- [25-29 October 2021 - Co-organized with RSMC La Reunion](#): Up to 3 forecasters for each RA I TCC Members with a total of 41 participants
- [26-30 April 2021 - Co-organized with RSMC Miami](#): Up to 2 forecasters for each RA IV HC Members + Portugal with a total of 42 participants
- [12-15 October 2021 - Co-organized with experts from BoM](#): with 40 participants from Samoa, Cook islands, Fiji, French Polynesia, Indonesia, Kiribati, Nauru, New Caledonia, Nuie, PNG, Solomon Island, Tokelau, Tonga, Tuvalu, Vanuatu.



CREWS training aimed to improve operational capabilities in Niger in which were trained 20 meteorological observers, on production and delivery of warning services of possible impact of severe weather events



# ETR future activities

## Competency implementation and improvement

Develop Guidances for competency implementation

Organise and support short term training events focused on competence development

Increase awareness on the need of competence approach implementation. Short videos dedicated to the need of competency implementation will be recorded and publicly available

Training programmes for On-the-Job Trainers and Competency Assessors for all WMO Regional Associations as an essential component of competency approach implementation

- 2022: RA I, and VI, with delivery in English and French
- 2023: RA II, III, IV, V, with delivery in English and Spanish

Workshops and Training events on access to and use of RSMC products

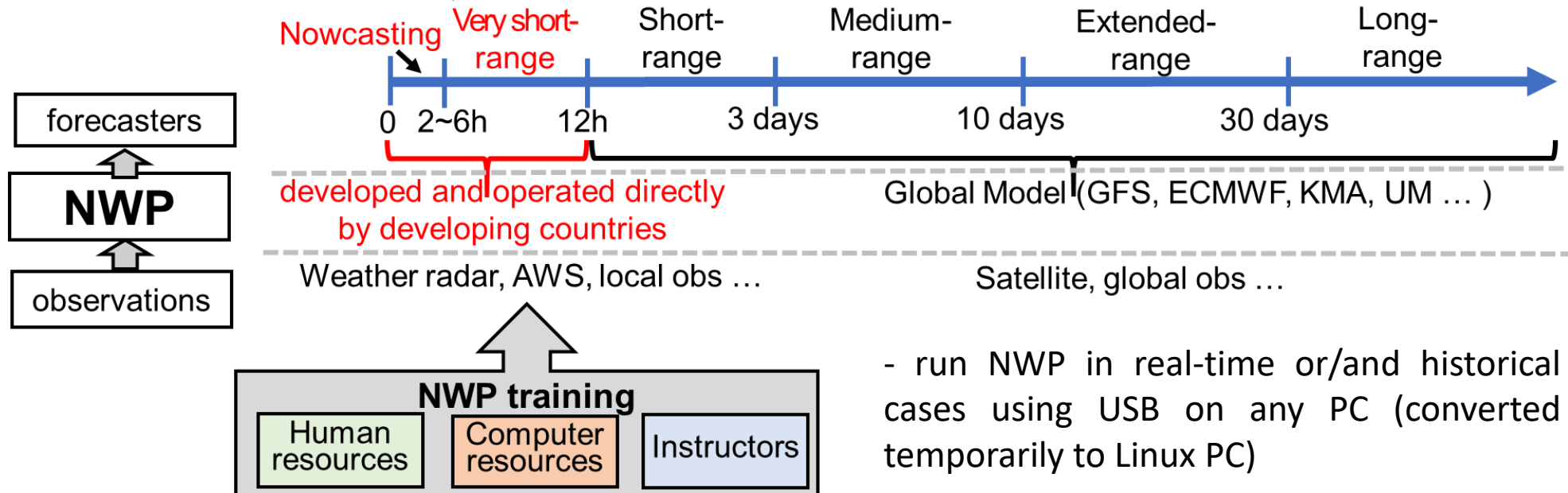
Guidance to WMO Education and Training Partners on curricular updates focused on GDPFS



# ETR future activities

## Dissemination of the UN (USB NWP) practice tool

WMO strategic plan: Long Term Goal 4.  
**Close the capacity gap** on weather, climate, hydrological and related environmental services.



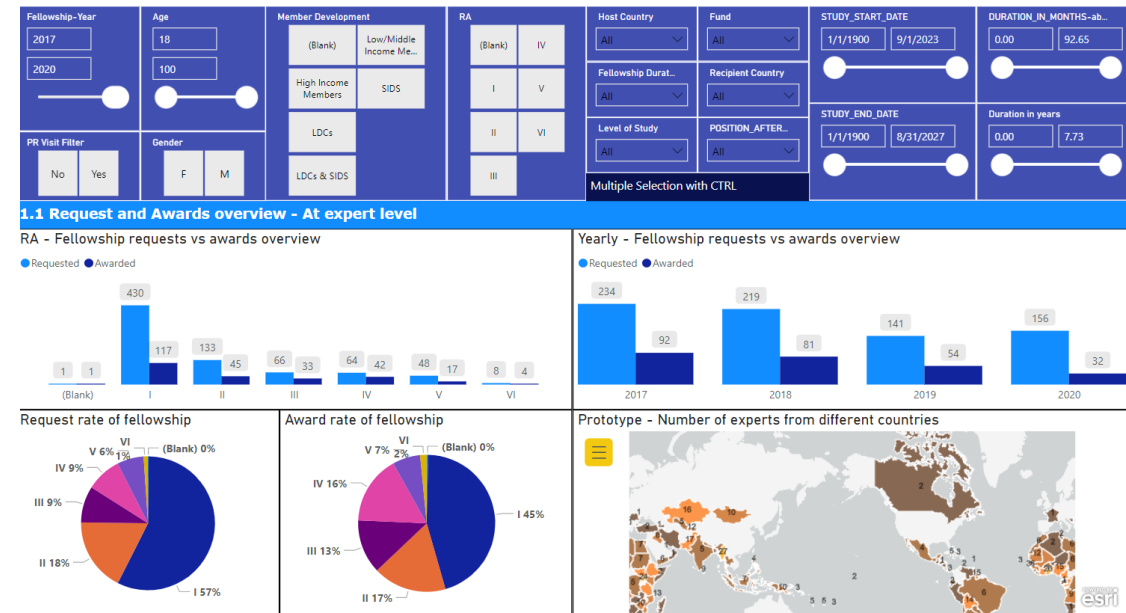
- run NWP in real-time or/and historical cases using USB on any PC (converted temporarily to Linux PC)
- Introduction of UN Tool to RTCs hosting NWP courses

## ETR future activities

### The Education and Training Administration System

The ETAS platform – dedicated to education and training, will facilitate:

- Internal coordination improved between ETR and other WMO departments
- Creating a full image of all WMO education and training activities
- A simple tool for registration to events organised by WMO
- Smooth replacement of the previous fellowship platform (FELLMAN)
- Easy to extract information regarding fellowships (short and long-term) and any other education and training events
- Automate issuance of relevant documents based on templates



# ETR Office 2022 Activities

1	On-the-Job Training (OJT) for Core Trainers (online)	4.2.01 (4.2.05)	Global
2	On-the-Job Training (OJT) (South Africa)	4.2.01 (4.2.05)	RA-I
3	On-the-Job Training (OJT) (Niger, in French)	4.2.01 (4.2.05)	RA-I
4	On-the-Job Training (OJT) (UAE) 2023	4.2.01 (4.2.05)	RA-II
5	On-the-Job Training (OJT) (Peru)	4.2.01 (4.2.05)	RA-III
6	On-the-Job Training (OJT) (Barbados) 2023	4.2.01 (4.2.05)	RA-IV
7	On-the-Job Training (OJT) (Indonesia)	4.2.01 (4.2.05)	RA-V
8	On-the-Job Training (OJT) (Romania)	4.2.01 (4.2.05)	RA-VI
9	Special support to Civil Aviation and Meteorological Authority of Republic of Yemen	4.2.01	RA-II
10	Support to course participants of ENM of France	4.2.01	RA-I
11	Fellowship Matters including ETAS	4.2.02	Global
12	Webinar Series on Leadership and Management Programme for NMHSs (UK)	4.2.03	Global

13	Leadership and Management Programme for RA-II & RA-V (Singapore)	4.2.03	RA-II & RA-V
14	Leadership and Management Programme for RA-VI	4.2.03	RA-VI
15	WMO-No. 1289 - Publication of A Primer on Public Policy and Management with a Focus on NMHSs	4.2.03	Global
16	Leadership and Management Programme for RA-I (South Africa) 2022-2023. I	4.2.03	RA-I
17	Group PR Induction Online	4.2.03	Global
18	WMO-No. 939 - Review of "Reference Guide for Permanent Representatives of Members with WMO"	4.2.03	Global
19	WMO-No. 1195 - Review of "Guidelines on the Role, Operation and Management of NMHSs"	4.2.03	Global
20	Finalization of the 2021 Survey	4.2.04	Global
21	Publication of the Fellowships 10-year Overview	4.2.04	Global
22	WMO-No. 1169 - Review of "Guide to the Management and Operation of WMO RTCs"	4.2.06	Global
23	WMO-No. 1205 - Review of "Guide to Competency"	4.2.06	Global
24	WMO-No. 1114 - Review of "Guidelines for Trainers in Meteorological, Hydrological and Climate Services"	4.2.07	Global
25	Publication of SYMET-14 Proceedings	4.2.08	Global
26	Blended Training Course for Development of Competency in Weather Forecasting in Africa (South Africa)	4.2.14	RA-I
27	NWP Group Fellowship Training hosted by WMO RTC in Indonesia	4.2.14	RA-II & RA-V
28	NWP Group Fellowship Training hosted by WMO RTC in Egypt	4.2.14	RA-I
29	NWP Group Fellowship Training hosted by WMO RTC in India	4.2.14	RA-II
30	NWP Group Fellowship Training hosted by WMO RTC in Algeria (in French)	4.2.14	RA-I
31	WMO Marine Services Course for the Caribbean (Phase I - Online)	4.2.17	RA-IV
32	WMO Marine Services Course for Africa (Phase I - Online)	4.2.17	RA-I
33	WMO Marine Services Course for the Pacific Islands (Phase II - F2F)	4.2.17	RA-VI
34	Impact-based Forecast (IBF) and Warning Services Training Modules Development	4.2.18	Global
35	Review and update of WMO Course for Trainers (possible delivery of one online module in English)	4.2.20	Global
36	Consortium of WMO Education and Training Collaborating Partners (CONNECT) to be developed	4.2.21	Global
37	Collaboration with University of Geneva on Masters Programme (MEIG)	4.2.21	Global
38	Annual Reports of WMO RTCs Collected and Anvlyzed	4.2.21	Global
39	External Review of WMO Regional Training Centre in Italy (25-26 May 2022)	4.2.22	RA-VI
40	External Review of WMO Regional Training Centre in Turkey (30 May - 2 June 2022)	4.2.22	RA-VI
41	External Review of WMO Regional Training Centre in Indonesia	4.2.22	RA-V
42	Completion of Review of WMO Regional Training Centre in Russian Federation	4.2.22	RA-II-VI

43	Completion of review of WMO Regional Training Centre in Costa Rica	4.2.22	RA-IV
44	Completion of review of WMO Regional Training Centre in India	4.2.22	RA-II
45	Support to Lusophone countries (via Angola, Mozambique)	4.2.25	RA-I
46	CDP-4 Coordination of activities and development of CDS	4.2.26	Global
47	CDP-5 Coordination of activities and development of CDS	4.2.26	Global
48	CDP-6 Coordination of activities and development of CDS	4.2.26	Global
49	Providing support to course designers from Technical Departments and RTCs	4.2.23 (4.2.01)	Global
50	Resource mobilization through Korean Meteorological Administration	4.2.23 (4.2.01)	Global
51	Support to RTCs to develop online facilities/infrastructure	4.2.23 (4.2.01)	Global
52	Public Private Engagement (PPE) Training Modules Development	4.2.23 (4.2.01)	Global
53	WMO Distance Learning Course on Interoperable Data Exchange in Hydrology	4.2.23 (4.2.01)	Global
54	Climpact Online Workshop	4.2.23 (4.2.01)	RA-I & RA-II
55	Quality Management Systems (QMS) Internal Auditing Workshop (in English)	4.2.23 (4.2.01)	RA-I & RA-VI
56	Quality Management Systems (QMS) Internal Auditing Workshop (in French)	4.2.23 (4.2.01)	RA-I
57	Eumetcal Webinar Series: Evaluating the Impact of Training	4.2.23 (4.2.01)	Global
58	Review of the WMO Global Campus E-Library	4.2.23 (4.2.01)	Global
59	Resource mobilization with RTC Italy on Building Capacities on Innovative Climate Services for Water and Agriculture in Africa	4.2.23 (4.2.01)	RA-I
60	Review of the ETR Moodle platform	4.2.23	Global
61	BIP-M Training F2F Component (Madrid)	4.2.23 (4.2.01)	RA-III
62	ETCOM Meeting	4.2.02	Global
63	New RTC Outreach Booklet		
63	***Manual on Education and Training publication (by the next year)		



# Education and Training Office at your service!



WMO OMM

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Organisation météorologique mondiale