

Actions speak louder than words!

**Role of IFMS in assisting WMO & WBG:
In Capacity Building through E&T**

Presented by:

Dr. Patrick Parrish & Prof. Sushil Dash

Moderated by: Prof. Liz Bentley

*There is no point in dreaming if we
do not work hard to Make it
happen! .*

Organizations involved in creating a "Weather Ready Globe"



National
Meteorological
Services

Financed by
United Nations



National
Meteorological
Societies

Financing being
Sought



HydroMet
Equipment
Industry

Financed by World's
Richest Nations



World's
Least Developed &
Developing Nations

Industry

Teamwork
makes the
dream work



**International Forum of
Meteorological Societies**

**uniting National Hydromet
Societies**



AGENDA

PROGRAM

1. Welcome to attendees by Dr. Harinder Ahluwalia &
Introduce IFMS & Prof. Liz Bentley – Moderator of the Webinar 5 minutes
2. Prof. Liz Bentley – Moderator of the Webinar
IFMS Council Member for RA6 & Chair Accreditation and Certification 5 minutes
3. Presentation by Dr. Patrick Parrish – Chief of Training at WMO
Presentation on WMO Global Campus Initiative 30 minutes
4. Presentation by Dr. Sushil K. Dash
IFMS Chair E&T and Webinar 20 minutes
5. Q&A Session Moderated by Prof. Liz Bentley
All Questions to be asked through Q&A facility of Zoom Webinars 25 minutes
6. Wrap up Dr. Harinder Ahluwalia 5 minutes
President IFMS

Total: 90 Minutes



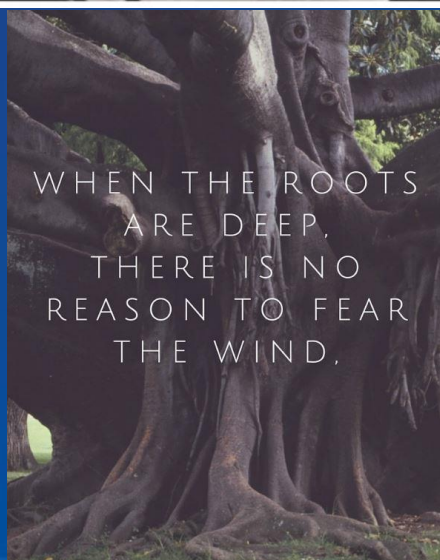
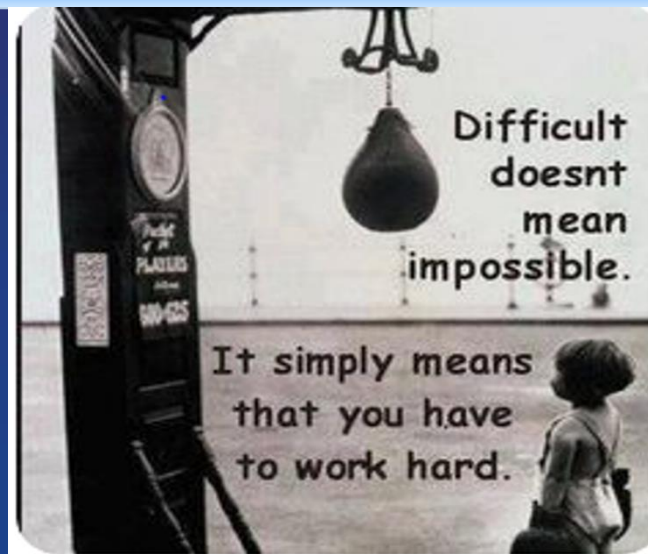
Major Activities

- **Uniter of all Meteorological Societies of the world**
- **S&T Collaboration**
- **Creating Societies and strengthening existing ones**
- **Education and Training**
- **Many other activities like keeping members aware of WMO and WBG Programs**
- **Best Practices, Certification, etc.**
- **Promoting Financing NMSocs & NMS**
- **Your door to WMO and WBG**

I believe ...

No Excuses.....

IF IT IS IMPORTANT
TO YOU, YOU WILL
FIND A WAY.
IF NOT, YOU'LL FIND
AN EXCUSE.



A RIVER
CUTS THROUGH
A ROCK
NOT BECAUSE
OF ITS POWER
BUT ITS
PERSISTENCE



www.ifms.org

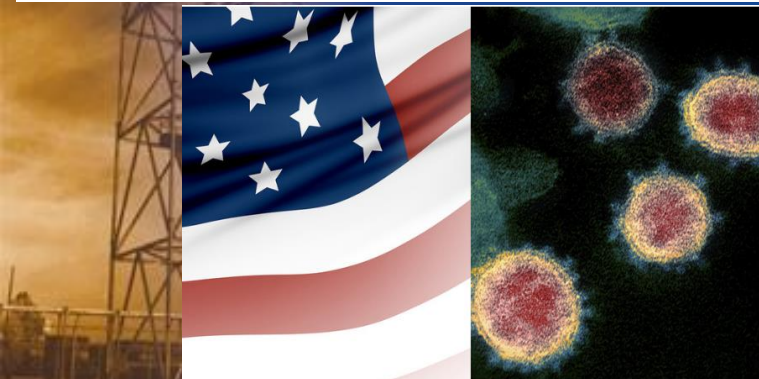
Reactive vs Proactive When you are not & When you are prepared



quake in Iran-Iraq ...



Earthquake proof buildings- where are ...



**Disaster response expert
explain why the U.S. wasn't
more prepared for the
pandemic**



Offer your Services as Volunteers



Don't expect others to do it



Offer yourself as Volunteers



MODERATOR

Moderator: Prof. Liz Bentley, CEO of Royal Met Society, IFMS-Rep RA-6



Prof. Liz Bentley is the Chief Executive of the Royal Meteorological Society and a visiting Professor at the University of Reading.

She completed her PhD in mathematics at the University of Manchester and worked at the UK Met Office for 15 years as a research scientist, weather forecaster, forecasting instructor and Chief Instructor at the Met Office College. She has also worked at the BBC Weather Centre and the Ministry of Defence looking after their environmental research programme.



WMO Global Campus: Open Educational Practice in Action

Prepared for the IFMS Webinar, 17 Feb 2021

Patrick Parrish
Chief, Education, Training and Fellowships Division
Education and Training Office
WMO Member Services Department



WMO OMM

World Meteorological Organization
Organisation météorologique mondiale

Open Educational Practices (OEP)

Open educational practices (OEP) is a broad descriptor of practices that include

- Creation, use, and reuse of **open educational resources** (OER)
- **Open sharing** of teaching practices
- **Open research** practices, such as sharing of raw data
- Promoting use of **open access** tools
- Use of **open pedagogies** that encourage dialogue with and between learners, such as problem-based learning
- Supporting learners in creating flexible, **personal** learning networks
- Developing peer **learning communities** (students and professionals) or communities of practice

WMO Global Campus Fundamentals

Collaboration, Cooperation, Sharing

Builds upon the existing WMO ETR Programme, or ETRP (RTC network, national centres, other national and international training partners, universities, regional partnerships, and allied communities, such as professional societies)

Activities should increase learning opportunities for Members, through (a) increased visibility, (b) sharing resources, (c) facilitating innovations, (d) promoting compliance with international (WMO) standards, (e) enhancing quality of learning.

WMO Global Campus is an ETRP initiative, not a new programme or a proposal to move all training online.



Global Campus Endorsements

SYMET-13 (2017): “...the feasibility activities in the WMO Global Campus demonstration show positive progress. SYMET-13 recommends the WMO Global Campus concept is further developed by the WMO Education and Training community for operational implementation during the 2020 to 2023 Financial period.”

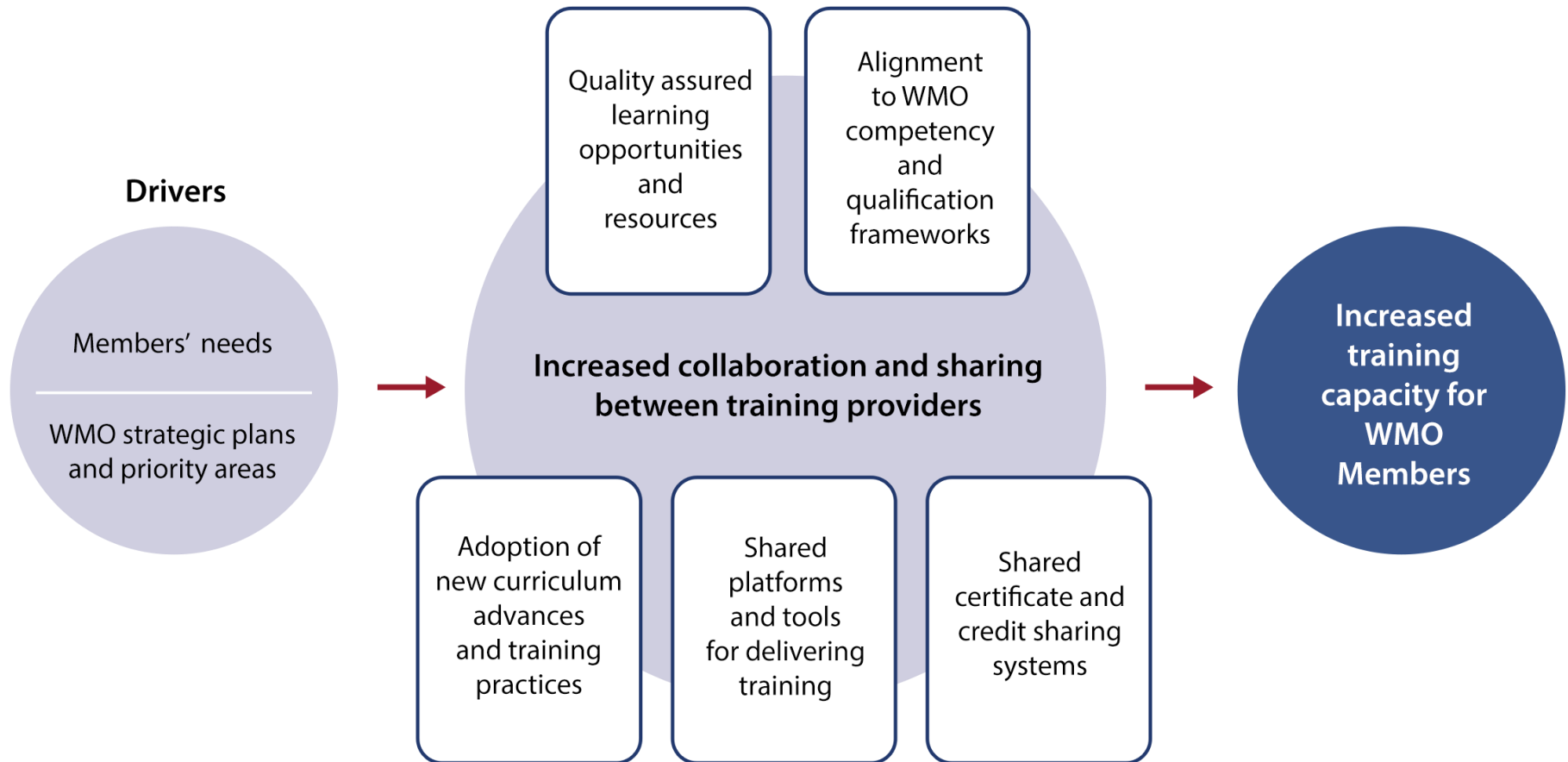
EC Panel on ETR-28th Session: “... **decides** to endorse the WMO Global Campus initiative for developing a coordinated and collaborative network of institutions that work together to meet the growing education and training needs of WMO Members...”

Executive Council-70, Dec. 48. : “...**decides** to endorse the WMO Global Campus initiative ..., building upon the existing network of WMO Regional Training Centres (RTCs) and other WMO training partners.

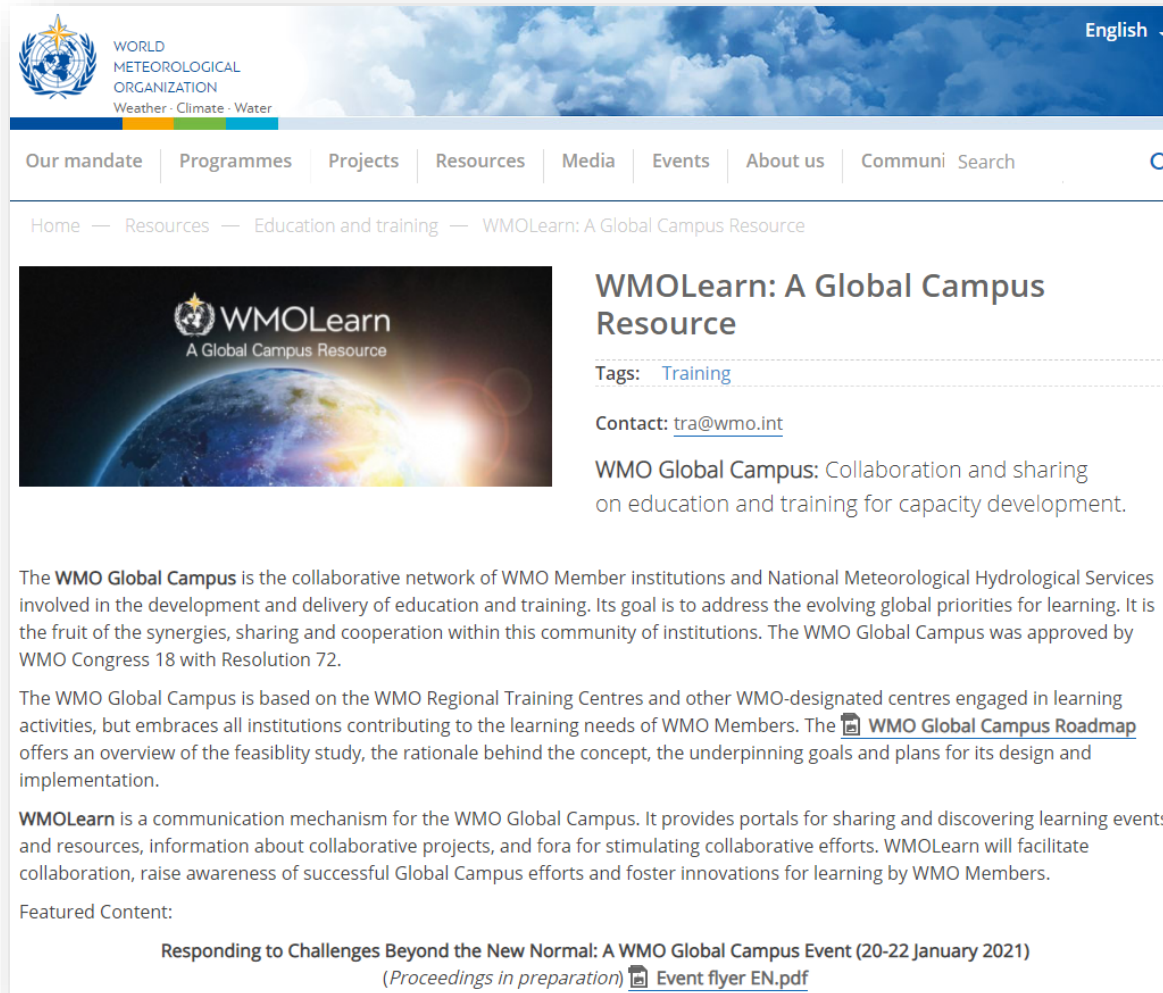
WMO Congress-18, Res. 72: “...**Decides** to endorse the WMO Global Campus for developing a coordinated and collaborative network of institutions the work together to meet the growing education and training needs of WMO Members... **Urges Members** to take an active role in the WMO Global Campus by forming regional and global collaborations...”



WMO Global Campus Thematic Areas



WMOLearn Portal



The screenshot shows the WMOLearn Portal website. At the top, there is a blue header with the WMO logo and the text "WORLD METEOROLOGICAL ORGANIZATION Weather · Climate · Water". To the right of the header is a language selector set to "English". Below the header is a navigation bar with links: "Our mandate", "Programmes", "Projects", "Resources", "Media", "Events", "About us", "Communi", and "Search". Below the navigation bar is a breadcrumb trail: "Home — Resources — Education and training — WMOLearn: A Global Campus Resource". The main content area features a large image of the Earth with the WMOLearn logo and the text "A Global Campus Resource". To the right of the image is the title "WMOLearn: A Global Campus Resource" and a "Tags" section with the tag "Training". Below the tags is a "Contact" section with the email "tra@wmo.int". The main text describes the WMO Global Campus as a collaborative network of WMO Member institutions and National Meteorological Hydrological Services involved in the development and delivery of education and training. It mentions that the WMO Global Campus was approved by WMO Congress 18 with Resolution 72. The text also states that the WMO Global Campus is based on the WMO Regional Training Centres and other WMO-designated centres engaged in learning activities, but embraces all institutions contributing to the learning needs of WMO Members. It mentions the "WMO Global Campus Roadmap" which offers an overview of the feasibility study, the rationale behind the concept, the underpinning goals and plans for its design and implementation. The text also mentions that WMOLearn is a communication mechanism for the WMO Global Campus, providing portals for sharing and discovering learning events and resources, information about collaborative projects, and fora for stimulating collaborative efforts. WMOLearn will facilitate collaboration, raise awareness of successful Global Campus efforts and foster innovations for learning by WMO Members. The "Featured Content" section lists "Responding to Challenges Beyond the New Normal: A WMO Global Campus Event (20-22 January 2021)" with a link to the "Event flyer EN.pdf".

WMOLearn
A Global Campus Resource

WMOLearn: A Global Campus Resource

Tags: [Training](#)

Contact: tra@wmo.int

WMO Global Campus: Collaboration and sharing on education and training for capacity development.

The **WMO Global Campus** is the collaborative network of WMO Member institutions and National Meteorological Hydrological Services involved in the development and delivery of education and training. Its goal is to address the evolving global priorities for learning. It is the fruit of the synergies, sharing and cooperation within this community of institutions. The WMO Global Campus was approved by WMO Congress 18 with Resolution 72.

The WMO Global Campus is based on the WMO Regional Training Centres and other WMO-designated centres engaged in learning activities, but embraces all institutions contributing to the learning needs of WMO Members. The [WMO Global Campus Roadmap](#) offers an overview of the feasibility study, the rationale behind the concept, the underpinning goals and plans for its design and implementation.

WMOLearn is a communication mechanism for the WMO Global Campus. It provides portals for sharing and discovering learning events and resources, information about collaborative projects, and fora for stimulating collaborative efforts. WMOLearn will facilitate collaboration, raise awareness of successful Global Campus efforts and foster innovations for learning by WMO Members.

Featured Content:


Responding to Challenges Beyond the New Normal: A WMO Global Campus Event (20-22 January 2021)
(Proceedings in preparation) [Event flyer EN.pdf](#)



WMO OMM

<http://learn.wmo.int>

WMO Global Campus Learning Events Calendar



[Home](#)[Request To Become A Contributor](#)[Contributor Login](#)

[Search](#)[Advanced Filters](#)

Upcoming Events


ADVANCED METEOROLOGICAL TRAINING COURSE Dates: 10-Sep-2018 to 08-Sep-2019 Event Format: Classroom course City: Pune Country: INDIA Language: English Host : Ministry of Earth Sciences Government of India
OPERATIONAL METEOROLOGY FOUNDATION COURSE (OMFC) Dates: 02-Jan-2019 to 09-Aug-2019 Event Format: Classroom course City: Exeter Country: UNITED KINGDOM Language: English Host : Met Office
OBSERVATION AND IDENTIFICATION OF CLOUDS FOR WMO TRANSLATORS AND INTERPRETERS (2ND EDITION) Dates: 25-Feb-2019 to 08-May-2019 Event Format: Online course Country: ONLINE Language: Spanish Host : AEMET
ENTRY LEVEL METEOROLOGICAL TECHNICIANS' COURSE NO. 89/19 Dates: 01-Mar-2019 to 26-Jul-2019 Event Format: Classroom course City: Husbands Country: BARBADOS Language: English Host : RTC Barbados - Caribbean Institute for Meteorology and Hydrology
FORECASTER'S TRAINING COURSE Dates: 11-Mar-2019 to 07-Sep-2019 Event Format: Blended course City: Pune Country: INDIA Language: English Host : Ministry of Earth Sciences Government of India
USING EARTH OBSERVATIONS TO MONITOR WATER BUDGETS FOR RIVER BASIN MANAGEMENT Dates: 13-Mar-2019 to 03-Apr-2019 Event Format: Online course Country: UNITED STATES Language: English Host : NASA Applied Remote Sensing Training Program (ARSET)
CAMBIO CLIMÁTICO, RIESGOS Y OPORTUNIDADES PARA EL SECTOR VITIVINÍCOLA Dates: 22-Mar-2019 to 10-May-2019 Event Format: Classroom course City: Vilafranca del Pebedés Country: SPAIN Language: Spanish Host : Wine Business School
WMO ONLINE COURSE FOR TRAINERS Dates: 25-Mar-2019 to 31-May-2019 Event Format: Online course City: Balashikha, the Russian Federation Country: ONLINE Language: Russian Host : Roshydromet



WMO OMM

<http://learningevents.wmo.int>

WMO Global Campus E-Library



WORLD
METEOROLOGICAL
ORGANIZATION
WEATHER CLIMATE WATER

user name Password
Forgotten password? |
Register

Library | WMO Publications | Other resources | Global Campus

Search English (UK)

Favourites list: empty

The WMO Global Campus E-Library

The WMO Global Campus initiative is proud to offer this WMOLearn Library of resources. This library provides a searchable collection of educational resources, including WMO publications and education and training materials from various contributing organisations and individuals. Search by WMO competency framework, Main Topics, Region and Country, and/or Nature of Information to find materials useful for training or self-directed learning.

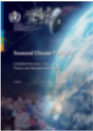
Please note that resources contributed by Members will reside on other websites and may allow limited access or require login. For copyright information, see the [WMO Global Campus Copyright Practice Standards](#) and the contributor's website.

WMO Global Campus resources provided on this Site are provided "as is", without warranty of any kind, either express or implied, including, without limitation, warranties of merchantability, fitness for a particular purpose and non-infringement. The WMO specifically does not make any warranties or representations as to the accuracy or completeness of any such resources.

You can search resources by using the filters on the right of the screen or by clicking "Refine your search" below. This will display advanced search criteria.

Add the result to your favourites | Refine your search

Sorted by



ETR, 22. Seasonal Climate Forecast - COURSE PACKAGE T.O.P. : Theory and Operational Principles, Project Report
World Meteorological Organization (WMO) ; Institute of Biometeorology (IBIMET) - CNR - WMO, 2018

This is the report on the project to create the Seasonal Climate Forecast - Course Package T.O.P. The goal of this online course package is to allow the transfer of seasonal climate forecast knowledge to improve and increase the operational capabilities of the targeted users. The package provides both a theoretical and a practical set of knowledge on seasonal forecast and predictability models, climate and data analysis, forecast verification, and specific application of seasonal forecast for agriculture and water management.

English

Filter

Language

- ☐ English [87]
- ☐ Spanish [24]
- ☐ French [20]
- ☐ Russian [19]
- ☐ Arabic [13]

[\[+\]](#)

Date of publication

- ☐ 2018 [19]
- ☐ 2017 [55]
- ☐ 2016 [5]
- ☐ 2015 [9]
- ☐ 2014 [17]


[\[+\]](#)

WMO Topics

- ☐ Observations [39]
- ☐ Guide [35]
- ☐ Cloud [25]
- ☐ Lesson/ Tutorial [24]
- ☐ Climate [23]

[\[+\]](#)

Regions and Countries



WMO OMM

<http://library.wmo.int>

Why should WMO promote OERs?

To drive innovation

To improve quality of content

To reduce costs

To allow for customization and translation

To promote accessibility

Social justice—to increase opportunity



Initial Global Campus Activities

WMOLearn Portal (learn.wmo.int)

WMO Global Campus Calendar (learningevents.wmo.int)

Global Campus E-Library (<https://library.wmo.int/>)

Translations Resource Center

Assistance in developing partnerships

Promoting innovation in E&T (including new WMO ETR publication)*

Database of experts and institutional capabilities

Standard competency achievement certificates

Building a global E&T community of practice



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*[WMO Global Campus Innovations](#)

Regional and university contributions to WMO Global Campus

Regional coordination and leadership expected from the WMO Regional Training Centres and other institutions and programmes that address regional training needs

WMO RTCs hosted in IberoAmerican countries met for coordination and planning in November, 2018. Ongoing collaborative projects. Publicized in MeteoWorld

Coordination meeting of RA-I (Africa) RTCs and allied training partners led to action plans for innovations.

Links between WMO Global Campus and Eumetcal-2 embedded in programme goals

Planning has been discussion for a meeting of a WMO Global Campus consortium of universities

Benefits of university collaboration and contributions

Universities see the WMO Global Campus as one mechanism for expanding their offerings beyond traditional on-site degrees

Global Campus can help them to reach a wider variety of students and understand the market for more advanced topics

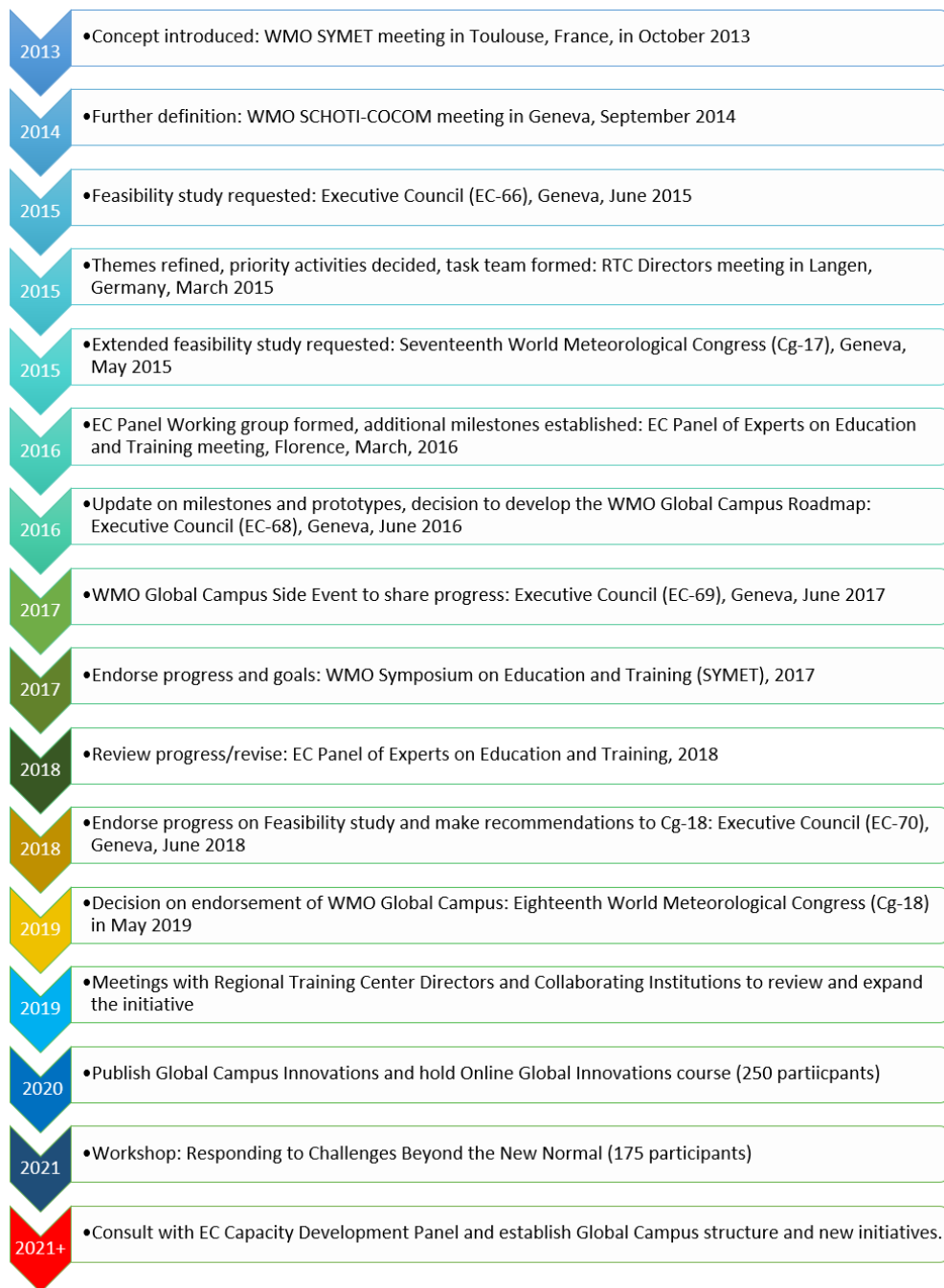
Global Campus can expand brand awareness of universities

Can make online courses and short-courses more viable through greater visibility

Many benefits in institutional collaborations in course and resource development (both University-University and University-NHMS)



Timeline: Where we are now



WMO OMM

WMO Global Campus Innovations

Global Campus Innovations

▮ *Volume I – New Pedagogical Approaches , Volume II – Curriculum Advances , Volume III – Collaboration in Education and Training , Volume IV – Technology-enhanced Learning*



World Meteorological Organization (WMO)

Published by: WMO ; 2020 (2020 edition)

Workplace changes occurring each day and more rapidly call for significant innovations in the way we educate and train people for their professional careers. The new global and digital economies call for fluidity, resilience, and readiness for rapid reskilling to meet changing demands. The many papers collected in this publication reveal just a small sample of the innovations being explored in education and training around the world. Many of these originated as goals to increase access for learners, to make learning more efficient, or to increase the impacts of training initiatives to ensure the investments of learners and teachers are well rewarded.

The papers represent innovations within the community that includes educators and trainers preparing people to work in meteorology, hydrology, climate services and related fields, as well as the communities that these professionals serve. It is just a snapshot of what is possible, but an eye-opening picture nonetheless.



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2020 WMO Course on Education and Training Innovations

2020 WMO Course on Education and Training Innovations

[Dashboard](#) / [My courses](#) / [Innovations](#)

 **WMO Global Campus**

 [Announcements from Course Organizers](#)

[Certificate Path Participants](#)

 [Certificate Path Participants Forum](#)

(7-11 December) Post-course Participant Innovation Exchange

"WMO Online Short Course on Education and Training Innovation Implementation"

Files: 2 URL: 1 Pages: 3 Forums: 5 OU blogs: 21
Progress: 25 / 26

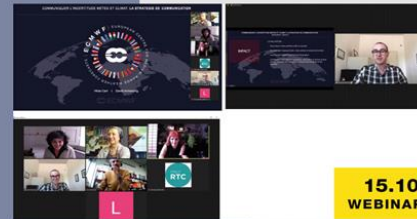
(25-31 May) Introduction to WMO Course on Global Campus Innovations

Labels: 5 Pages: 5 Files: 6 URLs: 4 Forums: 2
Progress: 9 / 9

2021 WMO Global Campus Event

Responding to Challenges Beyond the New Normal

A WMO Global Campus Event



Current and Upcoming Challenges

Reflecting on training challenges that have been identified

Gathering new input on challenges faced by RTCs and Training Partners

Prioritizing and setting actions and milestones

Alignment with WMO Strategic Plan

Coordinating training decisions with the WMO Strategic Plan

Alignment with WMO Competency Frameworks and Qualification standards

Referencing and utilizing key WMO guidance

Distance Learning Delivery

Developing increased capacity for distance learning delivery

Learning from successful practices through collaboration and sharing

Increasing quality and reach of our training



WMO OMM

Global Campus Challenges

Estimating, justifying and identifying budget and human resources to support defined activities.

Complexity of activities requires many partners and shared leadership

Strong outreach required to inform stakeholder communities of benefits and encourage participation

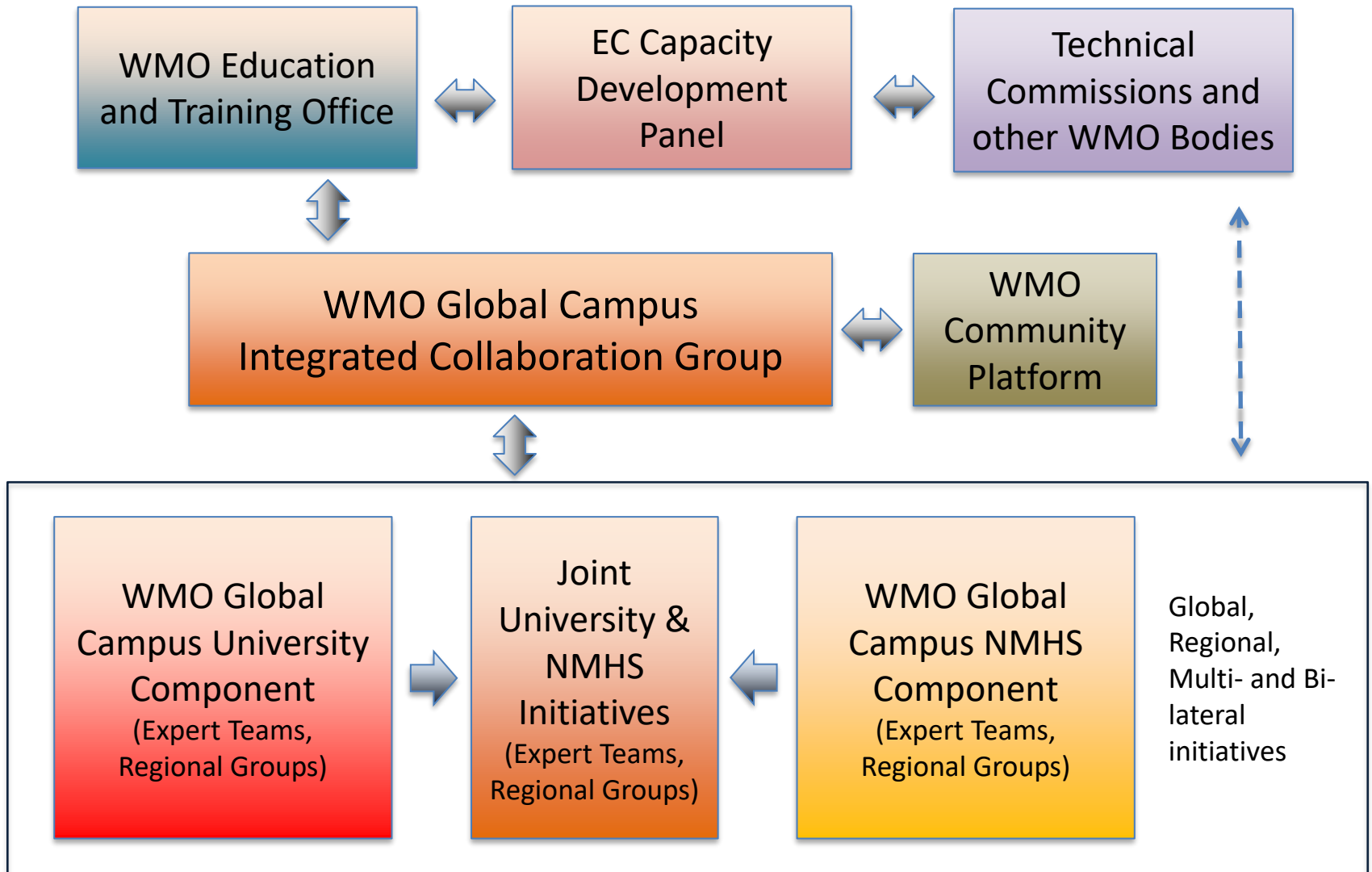
Monitoring and reporting framework to evaluate use, usefulness, and efficiency

Success requires participation by ALL Members



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Possible WMO Global Campus Advisory and Oversight Structure



How IFMS Members can contribute to the WMO Global Campus initiative?

- Agree to promote the Global Campus within societies globally
- Contribute learning resources, course plans, and expertise
- Utilize WMOLearn tools and communication mechanisms (<http://learn.wmo.int>) to announce learning events
- Organize **international** gatherings to explore paths for collaboration and sharing to meet global needs
- Work with the WMO ETR Office and EC Capacity Development Panel to propose and help collaboratively implement projects

Thank you Merci



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World Meteorological Organization
Organisation météorologique mondiale



IFMS Approach to Education and Training in Weather and Climate

Sushil Kumar Dash

Chair, IFMS Committee on Webinars & Training

Immediate Past President, Indian Meteorological Society

Formerly Professor & Head, CAS, IIT Delhi

Education, Training and Capacity Building/Development

- **Education:** Learning in the area of interest. It continues life long.
- **Training:** Short term, task oriented and skill development in a specific area.
- **Capacity-building:** Core concept of development policy. It suggests building something new from the ground up.

New term '**Capacity Development**' has been coined. It is an approach **that builds on existing skills and knowledge**, driving a dynamic and flexible process of change, borne by local actors. (*Ref: European Parliament Briefing April 2017*)

IFMS E&T Initial Steps

- Capacity development based on existing knowledge and skills in Weather and Climate is one of the objectives of IFMS.
- E&T efforts of IFMS was initiated in Boston AMS Annual Meeting, Jan 2020 with some invited talks and follow up discussion.
- Meeting between Dr. Patrick Parrish, Chief, WMO Training Programme; COMET Director Dr. Elizabeth Page and myself was held on 17 Feb 2020 in New Delhi.
- Discussions in the IFMS Council has lead to a Survey of the current E&T activities of its member societies.
- Webinar by COMET Director Dr. Elizabeth Page on 29th Jan 2020 which most of you joined.
- The just concluded presentation by Dr. Patrick Parrish, GCI, WMO.
- This is just the Beginning which will be followed by (Staying together) Progress and (Working together) Success (Henry Ford) with effective collaboration with international programmes such as COMET and GCI and among the Met Societies.



**IF YOU WANT TO GO FAST,
GO ALONE.
IF YOU WANT TO GO FAR,
GO TOGETHER.**

AFRICAN PROVERB

**VALUES
.COM**

IFMS Education and Training (E&T) Committee

IFMS is grateful to the following E&T Volunteer Experts



Prof. S.K. Dash, Chair
E&T Committee
Retd. Director CAS-IIT



Mr. Ramesh Bhutia
Past President IMS &
Retd. DG-IMD



AVM Dr. Ajit Tyagi
Past President IMS &
Retd. DG-IMD



Prof. Elizabeth Bentley
IFMS -Region 6 Rep-
CEO Royal Met Society



Dr. Harinder Ahluwalia
President IFMS



Mr. Michael Martens
IFMS -Region 5 Rep
President NzMS



Dr. Rattan Datta,
Director at MERIT
New Delhi



Dr. L. S. Rathore
Past President of IMS &
Retd. DG-IMD



Dr. Someshwar Das,
Director at MERIT
New Delhi



Mr. Narayan Gautam
Asst. Professor
Tribhuvan University, Nepal

IFMS Needs many more Volunteer Experts for E&T Committee. Please offer your service by sending an email to ifms.collaboration@gmail.com
Also Need Experts in Spanish, Portuguese, French and other languages

IFMS – Assisting in Capacity Building through Education and Training



**Prof. Sushil K. Dash, Dr. Harinder Ahlawalia, Mr. Ramesh C. Bhatia, Dr. Ajit Tyagi,
Dr. Ratan K. Datta, Prof. Sureshwar Das and Asst. Prof. Narayan Gautam**

1. Introduction

Global Warming and Climate Change (GW&CC) are having serious effects on the weather patterns resulting in great loss of life, property and quality of life. All nations need to be fully prepared to handle all challenges resulting from the effects of GW&CC. As Covid19 has shown, unpreparedness for calamities, whether natural or man-made, can cause great disruption in life on top of loss of life and economic development. A very important part of preparedness is capacity building in all countries – especially in Developing and Least Developed countries - through Education and Training (E&T). World Meteorological Organisation (WMO) plays a very important role in the area of capacity building. However, due to the vastness of this task and limited resources, WMO can use assistance of other organizations such as IFMS, which can provide assistance through its member Societies.

Since climate change affects all sections of the society, all stake holders need to be educated adequately to understand the contribution of human beings to the climate change, take appropriate measures to adapt to the situation, make proper policies to safe guard the society, make adequate scientific progress to deliver early warnings, etc. Therefore, E&T related to climate change issues must not be limited to the professionals working in meteorology and students in educational institutions and researchers in research organisations. Appropriate E&T should also be imparted to the general public, school teachers and students, policy makers, administrators and stake holders in the fields of agriculture, human health, tourism, fishing industry, etc.

Almost all nations have their own meteorological agencies which regularly monitor weather and climate related data and forecast the weather at different time scales. These weather agencies train their employees regularly and WMO helps these weather men get adequate training in their respective organisations. WMO has also several Regional Training Centres (RTCs) set up for the benefit of cluster of nations. In the recent years, it has been felt that with the advancement of weather instruments and climate science, the training material and methods need to be upgraded appropriately. From that perspective, the Global Campus Initiative (GCI) has been born. The basic objective of this initiative is to impart state-of-the-art training to the meteorologists working in National Meteorological and Hydrological Services (NMHSs) in order to get them educated on the advancements in the weather and climate science and to get them prepared for the future demands of forecasting. GCI also encourages the RTCs to collaborate with other educational and research organisations, where member societies of IFMS can contribute significantly through the extension of outreach programmes.

Why IFMS?

- IFMS consists of several Met Societies as its members which are very active and have close collaboration with NHMSs, Educational institutions, Stake holders, Associations and NGOs involved with the people at large.
- Members of Met Societies include not only several existing employees of NHMSs but also senior members who have long experience in the field and have potential to train others. Thus Met Societies can undertake the job of training the Trainers which will eventually lead to Chain reactions. This will have multiplying effects.
- IFMS can contribute significantly to the centrality of COMET and WMO-GC ie. Collaboration.
- IFMS will widen the scope of WMO-GC by encompassing Outreach programmes based on Citizens Science concept.
- IFMS with the help of Met Societies can contribute significantly in Climate Services where participation of the people is very important for last mile connectivity.
- IFMS can eventually contribute to the quality of training by modifying the existing course materials specific to the climate issues of different regions. Focus will be given on the regional languages and gender issues at the regional level.

Requirements of Collaboration, Volunteers and Funding

The success of this IFMS initiative very much depends on:

Collaborations with international organisations and also among National Met Societies. (Learning and Sharing)

Formation of Large Volunteers Group and adequate support.

Involving Senior members from Met Socs is the best strategy.

(Providing facilities and ease at work)

Formation of new Met Societies and Regional Societies.

(Support of NMHServices)

Joint PPA platform. (Division of responsibilities)

Sl. No.	Important E&T Themes in Weather & Climate
1.	Teachers & Students Training
2.	Public Awareness of Weather & Climate Disasters
3.	Exposure to Numerical Weather Prediction
4.	Satellite Data Use
5.	Data Collection Instruments
6.	Processing and Display System

IFMS needs to be selective in its approach

- E&T in Meteorology is not new. Several educational institutions, NMHSs, R&D institutions, Met Societies and similar organisations are on the job for years.
- Different types of course materials are available either on free platforms or on payment basis.
- Under the present circumstances, investing time (also funds) on the use of scientific knowledge for the Public Good is paramount.
- IFMS should focus on Teachers & Students and Public Awareness.

Teachers & Students Training

- Teachers are the backbone of any society. By training a teacher, one trains several others in the way of cascading effect. **There is hardly any climate science course at the school level in several Asian and African countries. Geography is the only subject taught at schools which covers some aspects of the climate.**
- **Science of weather and climate is interdisciplinary in nature** and it covers all important science subjects such as physics, chemistry, mathematics and geography in schools. **These subjects can be taught in the context of weather and climate, once the teachers are exposed to short training programmes.**
- Course materials can be compiled which will have good exposure to basics of weather and climate science, the observational set up, mathematical models, climate change, weather extremes and related other issues. Emphasis should be given on societal relevance.
- **Experts can visit specific schools and give seminars so that students will be exposed to basics climate science and the challenges of climate changes.** Real time participation will benefit in education. Sort of extracurricular activities. Examples are EcoClubs etc.
- Such efforts may encourage students to be innovative in combating the climate crisis.

Awareness programmes

- Considering the complexity of the climate change, its origin, uncertainties and tremendous adverse impacts on the society, it is of paramount importance that **various facets of climate science and climate change reach the people of all sectors in the society.**
- IFMS has a very responsible role to take science to the society by organising various types of events. There are several ways.
- **Awareness about the extreme weather events and related safety issues can be explained to the people in batches.**
- Human contribution to climate change can be explained to the people in simple local **languages by organising town hall seminars and also in schools and colleges.** World over, International Days are observed on important topics and issues.
- Mostly, the meteorological community is involved with **World Meteorological Day, World Environmental Day, Ozone Day, Water Day and Oceans Day.** Several Met Societies across the world are observing these days to a limited extent. When specific funds are available to the Met Societies, they can involve more people and celebrate these important days by arranging invited talks that will educate the people. There can also be interactive sessions and specific field visits on these days.

Notable Sites in Weather and Climate

(1) CALMet Moodle Course for Trainers and Educators

- This course may be suitable **for enhancing knowledge of the meteorologists who have some basic knowledge in the field.**
- This course is the result of the joint effort of different organizations. One can reuse and remix the material for educational purposes under the Creative Commons license. Different components are given below.
- ETRP Moodle Site (GCI Educational and Training Courses)
<https://etrp.wmo.int/course/index.php?categoryid=60>

[EUMETRAIN](#)

[EUMETRAIN Case Studies URL](#)

[EUMETRAIN Training Modules](#)

[WMO CGMS VLab](#)

Notable Sites in Weather and Climate

(2) MetEd

- These courses are meant for experienced meteorologist as well as students in Universities and R&D organisations. MetEd is a free collection of hundreds of training resources.
- MetEd is the outcome of the COMET Program, which is part of the [University Corporation for Atmospheric Research's \(UCAR's\) Community Programs \(UCP\)](#).

<https://www.meted.ucar.edu/registration.php>

(3) GLOBE Weather

- This free five-week curriculum is suitable for middle school students who will be benefited in understanding weather at local, regional, and global scales. The basis of this course is storyline instructional approach.
- This website consists of material supported by the National Center for Atmospheric Research, sponsored by the National Science Foundation and managed by the University Corporation for Atmospheric Research.

<https://scied.ucar.edu/globe-weather-curriculum>

Notable Sites in Weather and Climate

(4) UN CC:Learn

- This source is **suitable for E&T in general including public awareness generation.**
- UN CC:Learn is the result of the partnership amongst more than 30 multilateral organizations in designing and implementing climate change learning. It has both global as well as national appeals.

<https://www.unclearn.org/>

<https://www.unclearn.org/unclearn@unitar.org>

(5) UCSanDiago: Bending the Curve

- This series of four short courses are based on the multidimensional aspects of the climate change along with possible solutions. These are **suitable for general studies by students and people at large.** The solutions to combat the effects of climate change are discussed in terms of technological innovation, ecosystem management, market mechanisms and even behavior changes.

- bendingthe.curve.ucsd.edu

https://online.ucsd.edu/programs/080c48a1-70bf-439c-9eac-a02b60282209/about?gclid=EAIaIQobChMlvZ_dxtad6wIVQiQrCh0ihwWbEAAYASAAEgKmbvD_BwE#courses

Notable Sites in Weather and Climate

(6) National Resource Centre on CC IISER Pune

- These courses are ideal for **teachers and also beginners in weather and climate research**. The purpose of these courses are essentially to see that a teacher representing any discipline can gain new knowledge and can eventually integrate climate science with topics of his interest. Mostly the science teachers will gain to a large extent since weather and climate science is interdisciplinary in nature. Customised lesson plans are available to teach climate change at undergraduate level.

https://onlinecourses.swayam2.ac.in/arp19_ap55/preview

(7) UNESCO Climate CC Education

- This site is related to education on sustainable development programme and hence may be **suitable for policy makers, stake holders and general public at large**.

<https://en.unesco.org/themes/addressing-climate-change/climate-change-education-and-awareness>

Notable Sites in Weather and Climate

(8) MetLink, RMetS

- This provides separate links **for teachers as well as students at different levels** depending on their basic knowledge in weather and climate. Primary as well as secondary resources are available.
- There are plethora of lesson plans on weather and climate, information on the latest IPCC findings etc available which can be downloaded, but may not be free of cost.

<https://www.metlink.org/>

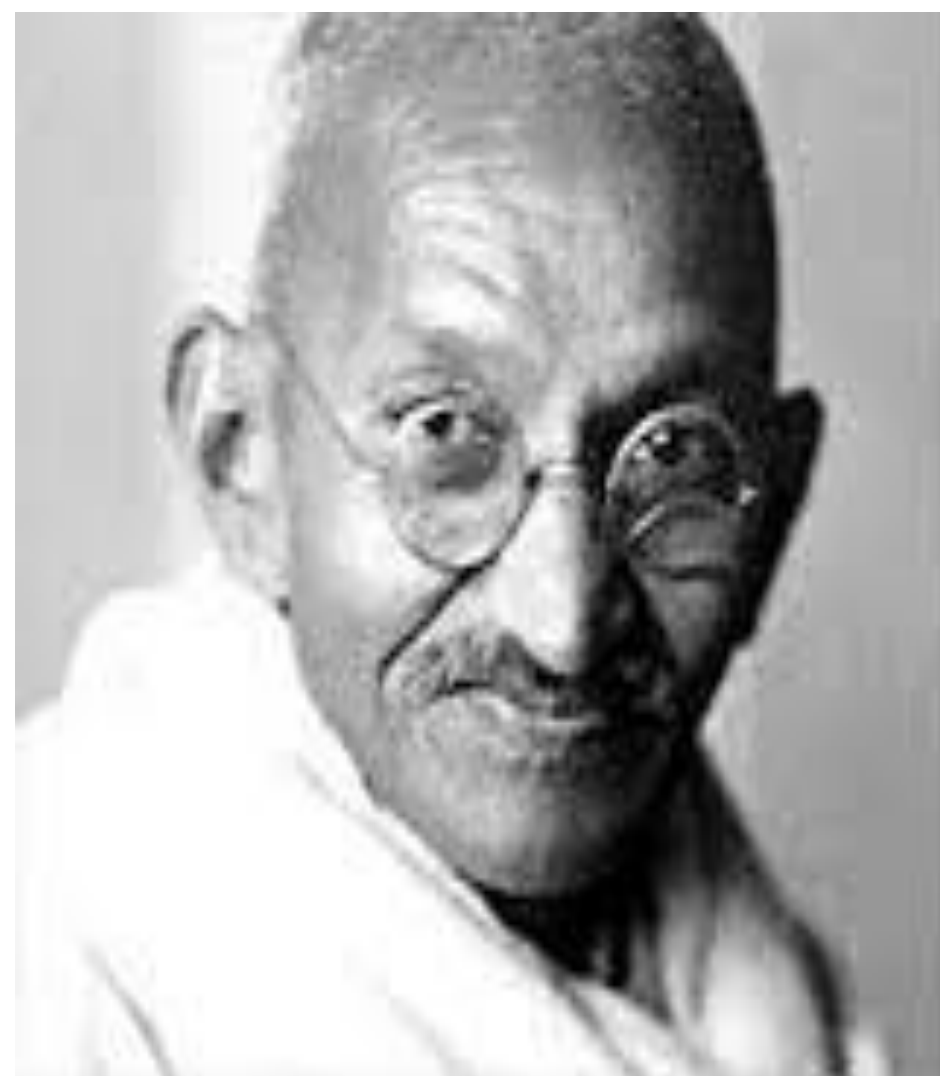
(9) AMS Education Program

- This programme is **suitable for school teachers as well as undergraduate faculty.**
- This programme includes course materials, in-classroom resources, educator instruction, and specialized training for educators in weather, water, and climate sciences. All course are not available freely.

<https://www.ametsoc.org/index.cfm/ams/education-careers/education-program/>

IFMS approach in the near future

- **Based on the current survey conducted among IFMS member societies, compile their success stories in E&T.**
- **Identify the successful programmes of one society and try to implement those in other societies in collaborative spirit.**
- **With the help of volunteers from member societies, identify suitable courses from selected sites and help Met Societies in executing those E&T programmes.**
- **IFMS jointly with GCI, COMET and other such international initiatives shall achieve a great deal in expanding the scope of Outreach Programmes in Weather and Climate.**



“Without action,
you aren't going
anywhere.”

Mahatma Gandhi

*Seeking your valuable
suggestions,*

*Thank you for your kind
attention.*