



## REPORT OF THE GLOBAL MEETING #7

INTERNATIONAL FORUM OF METEOROLOGICAL SOCIETIES

[www.ifms.org](http://www.ifms.org)

*Uniting Meteorological Societies of the World*

Version 02



### Hosted on Zoom Meetings

November 17 to December 15, 2021 (Every Wednesday & one Thursday)

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President - IFMS

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*Uniting NMSocs of the world to make the whole much bigger than its parts!*



*Building Capacity around the world by strengthening National Meteorological Societies & Regional Meteorological Societies and creating Collaborations*

## INTRODUCTION

The International Forum of Meteorological Societies (IFMS) held its 7<sup>th</sup> Global Meeting (IGM-07) during the period starting from November 17 to December 15, 2021.

The meeting was held in 5 Sessions were as follows:

### **Session 1: Get to know your sister Societies:**

In this session each member National Meteorological Society (NMSoc) which wished to make a presentation was given about 8 minutes each to make a presentation about its activities and plans. This session was split into 2 sub-sessions to facilitate participation by all members societies – one for the Western Hemisphere (November 17, 2021 – Wednesday 13:00 UTC) and the second one for Eastern Hemisphere (November 18, 2021 -Thursday 5:00 UTC). Fourteen Societies made presentation in the Session 1A and eight in Session 1B ***for a total of 22 NMSocs and associate member Societies***. Their Summaries are provided in the Session 1 Section of this document and their presentations are available on our website ([www.ifms.org](http://www.ifms.org)).

### **Session 2: Education and Training Approach of IFMS**

A presentation on Importance of Creating NMSocs and outline of the procedure to create an NMSoc was made by Dr. Harinder Ahluwalia. (30 minutes)

The above lecture was followed by a Panel Discussion on IFMS assistance in Capacity Building through Education and Training (E&T) with sufficient time for Q&A (total 90 Minutes). The total overall session was around 2:30 hours.

### **Session 3: Panel Discussion on IFMS Value Proposition**

A presentation on IFMS Value Proposition and Financial arrangements was made by Dr. Harinder Ahluwalia (30 minutes).

A Panel Discussion (5 panelists and one moderator) on direction IFMS should take. Each panelist made opening remarks (total 30 Minutes) and the rest of the time (one hour) was for Q&A and discussions.

### **Session 4: Education and Training Approach of IFMS**

Public Lecture on Causes and effects of Global Warming and remedies and actions we can take to protect ourselves (45 minutes).

Panel on GW&CC Effects and Remedies to minimize damage.

### **Session 5: Education and Training Approach of IFMS**

Presentation on European Multi-Hazard Early Warning System (MH-EWS) A4EU (Anywhere for Europe) by Prof. Daniel Sempere and implementation of A4EU in Spain by Dr. Xavier Lloret.

Panel Discussion on MH-EWS and on how benefits of MH-EWS can reach Developing and Least Developed Countries.



# Organizations involved in creating a "Weather Ready Globe"

Weather & Water Related Organizations				
<b>Beneficiary</b>	National Meteorological Services	National Meteorological Societies	HydroMet Equipment Industry	World's Least Developed & Developing
<b>Financed by</b>	UN	Donations (Volunteer-Based)	Industry	World's Richest Nations

## IFMS Global Meeting #7 Session 1A Western Half of Globe Get to know activities of your Sister Societies

On November 17, 2021 at 8:00 AM (New York Time) - 13:00 UTC

### PANELISTS



**Dr. Keith Seitter**  
Executive Director-AMS



**Dr. Jack Hayes**  
Retd. Director -NWS-US

### PRESENTERS



**Mr. Jim Abraham**  
President CMOS



**Ms. Ella Clark**  
Partnership Head - RMetS



**Dr. Keith Seitter**  
Executive Director-AMS



**Mr. Tafesse Gurm**  
President -EtMS



**Mr. Shanri Majithia**  
For EMS



**Mr. Alvaro Scardilli**  
President CAM (Arg.)



**Ms. Graciella Salaberri**  
Genesal Sec. FLISMET



**Dr. Jay Trobec**  
President IABM



**Dr. Andrea Király**  
MMT (Hungary)



**Dr. Someshwar Das**  
Convener SAMA



**Dr. Mathew Nadaki**  
Member TMS (Tanzania)



**Dr. Pablo Hernaez**  
Past President ISB



**Mr. Ayón Alfonso**  
Vice SG - SOMETCUBA



**Dr. Mario Caffera**  
President Amigo-del Viento



## **IFMS GLOBAL MEETING/CONFERENCE #7 – 2021: SESSION 1:**

### **GET TO KNOW YOUR PARTNERS (FELLOW-NMSOCS)**

**Presentation on activities of NMSocs in 8 minutes each and then the Moderator led the discussion. In order to facilitate the participation and presentations of as many members as possible, this session was conducted in two parts 1A and 1B over two days (Nov. 17 and Nov. 18, 2021, respectively).**

IFMS members made presentations of the activities of their NMSoc which included, as applicable, annual events they organize, 2-3 programs they consider important, outreach programs of potential benefit to IFMS members, future plans, and how IFMS can help them improve their society's and IFMS activities. The session began with a short overview of IFMS: its history, value propositions and significant accomplishments to provide context for member presentations. Since the presentations took substantial time – especially in Session 1A in which 14 NMSocs made presentations. Therefore, there was not much time left for Q&A. Following the presentations, the Moderators summarized the overall picture and discussed key points made during member presentations. If time permitted, there would have been a brainstorming discussion that would have solicited members' input on what should be IFMS priority initiatives, ideas about how to address them, and interested member contributions. This will be done in a future Webinar.

### **SESSION 1A**

#### **Moderators**

- A. Dr. Keith L. Seitter** Keith Seitter has been Executive Director for the American Meteorological



Society for 17 years, and on the staff of the AMS for the past 30 years. Prior to joining the AMS, Seitter was a professor of meteorology at the University of Massachusetts at Lowell. He received a BS in meteorology from the Pennsylvania State University and a Ph.D. in geophysical sciences from the University of Chicago. Seitter is a Fellow of the AMS and a Fellow of the Royal Meteorological Society, and a member of many other societies covering the sciences and scholarly publishing.

- B. Dr. John L. (Jack) Hayes** was the director of the National Weather Service (NWS) from 2007 to



2012. He also served as the permanent representative of the United States with WMO. Dr. Hayes also served as director of the World Weather Watch Department for the WMO in Geneva, Switzerland from 2006-2007. He has received several awards, including Presidential Rank Award and recognition, in 2003, as one of the Top 100 IT Executives in the Federal Government. Dr. Hayes holds a Ph.D. and a Master of Science degree in meteorology from the Naval

Postgraduate School in Monterey, California. He also worked as the Vice President & Senior Executive Account Manager for Environmental Solutions, Harris Space and Intelligence Systems Business Segment. After retiring from the Harris Corporation, currently, he serves as a part-time consultant for Barron Weather Services, assisting the company in understanding NMHS operations, needs and priorities.





## 1. Canadian Meteorological and Oceanographic Society (CMOS)

Jim Abraham, who is the President of CMOS is well known meteorologist - nationally and internationally - and is frequently invited as an expert by a variety of organizations and the media.



Jim managed a wide variety of weather, water, and environmental operational and research programs over a 36-year career with the Meteorological Service of Canada.

His most proud accomplishment was starting the Canadian hurricane forecast and research program for MSC.

Jim was awarded the Patterson Medal for Meteorology in 2003, the Queens Jubilee Medal in 2013, and a Fellow of the Canadian Meteorological and Oceanographic Society in 2017.

### Abstract:

Canadian Meteorological and Oceanographic Society (**CMOS**) is Canada's national society dedicated to advancing atmospheric and oceanic sciences and related environmental disciplines. It includes meteorologists, climatologists, oceanographers, limnologists, hydrologists and cryospheric scientists. It promotes understanding of weather, climate, air quality, and oceanography, and their effects on Canada and Canadians. Its membership consists of approximately 700 members from universities, government, the private sector, and the public.

Strategic priorities of CMOS comprise Governance and Membership, Scientific Excellence, Education and Outreach. **CMOS** comprises 14 local centres across Canada. It holds an annual scientific Congress, awards prizes and scholarships, organizes talks including annual CMOS Tour Speakers, supports participation of teachers in Project Wet, Project Atmosphere and Project Ocean, publishes 'Atmosphere-Ocean' (peer-reviewed journal) and the 'CMOS Bulletin SCMO', issues scientific position statements, endorses weathercasters & accredits consultants.

CMOS believes that Student Engagement is crucial; hence currently it provides free membership to them. It also charges them much reduced registration fee at CMOS Congress, they are eligible for student travel bursary to assist in attending a CMOS Congress and are also eligible for CMOS scholarships. We also provide them connection to potential opportunities.

CMOS has a close relationship with IFMS through Harinder Ahluwalia who was the past-president of CMOS. IFMS provides opportunity to share best practices and collaborate on joint initiatives, capacity building being an important one. CMOS has "Pragmatic" involvement with IFMS.

CMOS activities are mostly undertaken by volunteers.

## 2. Royal Meteorological Society (RMetS)

Ella Clark – as the Head of Partnerships at the Royal Meteorological Society, she leads business



development and develops innovative partnerships that support the delivery of RMetS strategy. She also heads the team responsible for membership, professional accreditation and marketing and communications.

Although not a meteorologist by training, she has had a varied career in sustainability over the past 15 years. Her background includes delivering consumer behaviour change campaigns and education programmes across

the waste sector, as well as leading high profile corporate and public sector partnerships on behalf of a number of charities.

### **Abstract:**

The Royal Meteorological Society works to strengthen the science and raise awareness of the importance of weather and climate, support meteorological professionals and inspire enthusiasts. We have over 3,000 members and deliver a broad range of programmes.

Through this presentation, we heard more about projects delivered by RMetS in 2021 including their work to ensure climate literacy in UK school children, empowering communicators to talk about climate change and developments in CPD support for professional meteorologists.

### **3. American Meteorological Society**

Dr. Keith L. Seitter made this presentation.

#### **Abstract: Title: Changing the Focus to Community Engagement**

Many societies, including AMS, have focused for many years on “member services” and the tangible benefits we offer for our members. The notion has been that members of our community will want to be members based on those benefits, which might range from our member magazines and newsletters to discounts on meeting registrations, books, or journal subscriptions. When we talk with today’s early career professionals, we find that for many of them, those sorts of tangible benefits are not as meaningful, and they rarely represent the primary reason for joining an organization. Many express a desire to have opportunities to serve the scientific community or the broader society as a key component in determining where they will invest their time and energy. They are looking for fulfilling engagement in activities that will have meaningful impact. AMS is refocusing its efforts toward this view and working to offer many more opportunities for engagement for members of our community. We are finding that early career professionals (and many mid and late career professionals) are eager to be part of programs and initiatives that give them an opportunity to contribute and especially those that give them an opportunity to lead. Professional networks are naturally expanded through this kind of service which leads to additional professional opportunities and professional growth. The members of our community who take advantage of these engagement initiatives view AMS as instrumental in furthering their career. This talk provided just a few examples of these efforts.



### **4. Ethiopian Meteorological Society (EtMS)**

Tafesse Regassa Gurmu obtained his Diploma in Statistics-Addis Ababa University and Advanced Diploma in Weather forecasting - Institute of Meteorological Training and Research –WMO Regional Meteorological Training Center) BA in Development Management - Alpha University College. Addis Ababa, Ethiopia. He has participated in Various Regional and International Seminars/Workshops/Trainings organized by the World Meteorological Organization. In addition, Managerial / Leadership Trainings locally. Joined National Meteorological Institute (the then National Meteorological Services Agency – **NMSA**) in 1980 as junior expert and promoted at various positions (Assistant Forecaster, Meteorological Officer, Head of Regional Meteorological Offices-Jimma & Jig Jiga) and Director of Aviation Meteorological Service & Education and Training Directorates. Totally served in the field of Meteorology for 38 Years and 8 Months and retired September 2019. He is one of the Founding Members of the Ethiopian Meteorological Society and is currently its President.



## **Abstract**

The primary objective of the presentation was to highlight activities done by the society since IFMS Global Meeting #06 in 2019 and future planned activities to be done. Also, IFMS contribution to strengthen the society was discussed and recommendation to improve collaboration with IFMS activities were stated.

## **5. European Meteorological Society (EMS)**

**Mr. Shanti Majithia** is a fellow of the Royal Statistical Society and Royal Meteorological Society with an extensive career in the energy industry and climate change adaptation. As the Head of Forecasting at UK National Grid, he had the additional responsibility for delivering a climate adaptation policy to manage the company's infrastructure risk.



Shanti was instrumental in bringing together the major UK energy companies to generate a ground-breaking study on climate change working with UK meteorologists. The project set out to establish the effect climate change would have on the energy industry infrastructure and business, with a view to translating the climate science for practical business application.

He was a key stakeholder for a number of years, worked closely with a range of government agencies and has been an active contributor to numerous research papers over the last 30 years – most recent work includes a chapter in the publication of a book on Weather Matters for Energy by Alberto Troccoli et al in 2011, published by Springer.

He formed an independent Energy Advisory company in 2011 providing linkages of climate science to Energy companies.

Shanti has been an active volunteer for the UK Royal Meteorological Society for many years. He is currently General Secretary of the Society.

## **Abstract**

Mr. Shanti Majithia represented European Meteorological Society (EMS) whose aims and objectivities are to advance the science, profession and application of meteorology, and of sciences related to it, at the Europe-wide level, for the benefit of the whole population.

To this end EMS works to enhance cooperation, communication and understanding between Member Societies and Associate Members.

The main body of the Society is the General Assembly of representatives of the Member Societies. It convenes at least once a year and decides on constitutional and financial matters of the Society.

The Council plans and directs activities and manages the affairs of the Society. It meets at least once between General Assemblies. Normally a spring meeting is held in March or April of each year.

The Council consists of nine members: three representatives of permanent Member Societies and six representatives with a term of three years that are elected by the General Assembly.

Permanent Members are: the UK - Royal Meteorological Society (RMetS), the German Meteorological Society (DMG) and the French Meteorological Society (Météo et Climat – SMF).



## 6. Centro Argentino de Meteorólogos (CAM)

**Alvaro Scardilli** President of the Argentine Meteorological Society (Centro Argentino de Meteorólogos) and head of the meteorology department at the naval hydrographic service. He is also



in charge of the Argentine Ice Service and navy weather service. He has a degree in atmospheric sciences from the Buenos Aires university. His work is mostly focused on the development of products related with ice and weather, for mariners in the South Atlantic Ocean and Antarctica. He is also the representative for region 3 (South America and caribe) at the global ocean observing system and the joint WMO-IOC collaborative board. Ha has operational experience after several Antarctic cruises on board navy ships during summer logistics operations.

He also directs and co-directs different research projects about ice and marine weather climatology and satellite imagery interpretation for sea ice and icebergs.

### Abstract

The Argentine Meteorological Society (Centro Argentino de Meteorólogos - **CAM**) was funded in 1969 by the meteorologists who graduated from Buenos Aires University. The main objectives of our organization are to promote the professional improvement of the meteorological activity, promote and encourage the scientific-technological activities of meteorology, make efforts before public authorities and public and private organizations for the benefit of members, among others.

CAM conducts periodic Congress in different cities of Argentina and creates its own scientific journal, called METEOROLOGICA, which is published since 1970 and serves as the Core of Argentine Scientific Journals since 2005. METEOROLOGICA publishes original papers in the field of atmospheric sciences and oceanography written in Spanish and/or English.

CAM is involved in the main task of getting the approval of the Professional Law to ensure the recognition of Meteorologists and the appropriate development of professional activities.

## 7. FLISMET: FEDERACION LATINOAMERICANA E IBERICA DE SOCIEDADES DE METEOROLOGIA.

**Graciela Salaberri**, Uruguayan meteorologist, South American regional representative of the Global Network of CSOs for Disaster Reduction (GNDR), Vice President of the Uruguayan Network of



Environmental NGOs, representative of the Civil Society Friends of the Wind and Permanent Secretary of the Federation Latin American Latin American Meteorological Societies (FLISMET). Senior Advisor for South America and the Caribbean of the Action on the Frontline - Community Resilience Program.

She specialized in Comprehensive Risk and Disaster Management at the Polytechnic University of Catalonia, 2005 and in Local Development Management in 2009 at the International Training Center of the ILO-DELNET (Turin, Italy). She is the author of various research papers and educational materials and has been the national coordinator and head of the global project First Line Vision.

She has 30 years of experience in public service, as Director of the Weather Forecast Directorate (DPT) of the National Meteorology Directorate (2000-2003), trainer in early detection of severe weather and climate phenomena, in-charge of the Management and execution of the technical areas in data

preparation, prediction, warnings and information to the public (Meteorological Services for the Public-SMP), promoting its management, incorporating for the first time in the SMP the concept of “Early Warning”, with the timely dissemination of preventive meteorological information through the media. Coordinator in Uruguay of the Pilot Project on Forecasts in World Cities of the World Meteorological Organization.

She is a founding member of the “Amigos del Viento” organization which was created in 2003 and is responsible for promoting a Culture of Prevention, dissemination and research in its technical, scientific and human dimensions.

#### **Abstract: Brief Description of FLISMET:**

The Latin American and Iberian Federation of Meteorological Societies is a Federation of Associations in two continents united by common languages (Spanish-Portuguese). It was founded in 1986 by the Argentine Center of Meteorologists (CAM), the Brazilian Meteorological Society (SBMET) and the Mexican Meteorological Organization (OMMAC), with the name Latin American Federation of Meteorological Societies

In 1992, the Cuban Meteorological Society (SOMETCUBA) and the Spanish Meteorological Association (AME) joined and through statutory approval the Federation was renamed the Latin American and Iberian Federation of Meteorological Societies (FLISMET)

In the current period (2019-2021) the presidency is led by Dr José Luis Sánchez- of the AME.

FLISMET's current Strategic Plan includes:

- Promote collaborative and exchange activities among members
- Promote good professional practices and their accreditation
- Promote training activities in support of affiliated companies (currently in Spanish, soon in Portuguese).

## **8. International Association of Broadcast Meteorologists**

1. **Jay Trobec, Ph.D.,** is Chief Meteorologist of KELOLAND TV in Sioux Falls, South Dakota, USA. In



addition to television responsibilities, he has taught Meteorology and Physical Climatology at South Dakota State University. He is a Fellow of the American Meteorological Society, and is an AMS Certified Broadcast Meteorologist (CBM) and Certified Consulting Meteorologist (CCM). Jay was Commissioner on Professional Affairs for the AMS from 2010-2016, serves on the Media and Communication Team of the European Meteorological Society, and became Chairman of the International Association of Broadcast Meteorology in 2018.

#### **Abstract:**

The International Association of Broadcast Meteorology represents the worldwide broadcast meteorology community, collaborating with the WMO and other professional organizations to support and promote the profession. We work to aid and encourage members to foster the improved delivery of weather and climate information to viewers. We have the goal of providing accurate and easily-understood weather information to the public on a daily basis. Covid-19 has made the jobs of broadcast meteorologists - like the rest of the weather and climate enterprise - more difficult. It is hoped that advances made in combating the pandemic will allow broadcast meteorology to resume its focus on the mission more effectively.

## **9. Hungarian Meteorological Society (MMT)**



**Dr. Andrea Király** is speaking on behalf of the Hungarian Meteorological Society (MMT) from Budapest, Hungary. She is a physicist and a teacher of mathematics and physics. She obtained her Ph.D. in Statistical Physics with a thesis entitled “Long-range correlations in daily temperature records”. She was an Assistant Professor at ELTE Eötvös Loránd University between 2011–2020, the head of the Hungarian team in an EU FP7 project called PARRISE (Promoting Attainment of Responsible Research and Innovation in Science Education) between 2014–2017, the head of the Science Centres and Informal Learning Working Group of the MTA-ELTE Physics Education Research Group in 2016–2021, and member of the Modelling Unit at the Hungarian Meteorological Service in 2020–2021.



## Abstract

The Hungarian Meteorological Society (MMT) was founded in 1925. Historically the main goal of forming the Society was to support financially the only Hungarian meteorological journal, which was established as a private paper in 1897 and was in financial crisis in 1925. Nowadays this periodical (title: IDŐJÁRÁS, means WEATHER) is issued in English and indexed in scientific databases.

The basic object of MMT is the study of meteorology, improving the general education, disseminating meteorological knowledge, the environmental mentality and disseminating new scientific results. The MMT organizes scientific meetings and symposia, establishes permanent and ad hoc committees, maintains sections, co-operates with other institutions and international organizations, issues and edits meteorological publications, prepares meteorological studies, awards the outstanding meteorological activities.

The structure of the MMT as an organization is twofold, it has 8 thematic sections and 6 regional sections in the country, in main cities of Hungary.

During the term of office of the 2014–18 period 143 meetings were organized together with the annual assemblies and biennial meetings. In the last one and a half year unfortunately - because of the COVID situation - some meetings had to be cancelled or postponed. At the beginning of December, the 5th Medical Meteorology Conference will be held, topics include e.g., the health risks of (indoor and outdoor) air pollution, and the health effects of weather fronts and implications of climate change. (If the epidemic situation becomes worse, the conference will be held online.)

## 10. South Asian Meteorological Association (SAMA)

**Prof. (Dr.) Someshwar Das** is Convener of the South Asian Meteorological Association. He is a former Professor, Department of Atmospheric Science, Central University of Rajasthan and former Scientist-G, National Centre for Medium Range Weather Forecasting and India Meteorological Department, New Delhi. He worked at NASA/ Goddard Space Flight Center, Maryland, USA as a USRA Research Scientist. He was Visiting Scientist at National Centre for Atmospheric Research (NCAR), USA. He worked at European Centre for Medium Range Weather Forecasts (ECMWF), UK as a WMO Consultant. He worked at SAARC Meteorological Research Centre (SMRC), Bangladesh as Head of its Theoretical Division. He also worked at Nepal Meteorological Service, Kathmandu as an Asst. Meteorologist. His research interests are Atmospheric modelling, cumulus convection, cloud microphysics, severe weather forecasting. He has total 170+ publications (including 52 in peer reviewed journals). Prof. Das obtained PhD degree in Atmospheric Science from Indian Institute of Technology, Delhi in 1987.



## **Abstract:**

The South Asian Meteorological Association (SAMA) comprising of 9 countries, Afghanistan, Bangladesh, Bhutan, India, Maldives, Myanmar, Nepal, Pakistan and Sri Lanka was established in August 2020. Presently there are more than 300 members of SAMA including professionals and students. *ICIMOD*, and *RIMES* are the institutional members of SAMA. An Advisory Committee (AC) of SAMA is formed including members of all the countries. The activities of SAMA are guided by the AC.

The vision of SAMA is sharing knowledge of weather without Borders. Its mission is “Meteorology for the socio-economic development of the region”. Its objectives are (1) foster interaction amongst professionals working in Meteorology and allied fields in South Asia, (2) advancement of Meteorological and allied sciences in South Asia, (3) Communicate knowledge of climate change and extreme weather events to the public through Citizen Science and outreach programs, (4) application of Meteorology and allied sciences for sustainable development of the region, and (5) promote Public, Private and Academia partnership for the promotion of Meteorology and its societal applications.

During the last one year, SAMA has organized two General Body Meetings (GBM), 3 AC meetings, and 9 webinars/ training workshop. SAMA has formed effective Scientific Committees to develop subject-specific research and applications, such as Education & outreach, NWP, Satellite Meteorology, Radar Meteorology, Air Pollution, and Climate Change, etc. for an overall development of the region. It has published its 1<sup>st</sup> quarterly Newsletter.

SAMA will continue organizing monthly webinars/ training workshops on the subjects of regional importance. Some of its future plans are to develop regional research projects, constitute awards to encourage young generations in the field, encourage member countries to start country-wise chapters of SAMA, conduct need based training workshops to develop Meteorological and Hydrological services, engage private sector in promoting application of new technologies in instrumentation and software in meteorology, etc.

## **11. Tanzania Meteorological Society**

**Mr. Mathew Ndaki** is a Meteorologist working with Tanzania Meteorological Authority (TMA), and a Member of Tanzanian Meteorological Society (TMS) from the year 2009 to date. In TMS, he is among



members of TMS secretariat and he has participated in various AfMS and IFMS meetings. At TMA he is currently an Officer in the International Meteorological Cooperation Unit since 2018 to date, with the responsibility of coordinating International Meteorological Cooperation activities in the country, and he is designated an Assistant of the Third Vice President of the World Meteorological Organization (WMO). Mr. Mathew is an expert in Application of Remote Sensing and GIS in Agrometeorology, who holds a postgraduate degree in Meteorology

and a BSc. Degree in Environmental Sciences and Management. He has worked in the area of agrometeorology, for six years from 2013 to 2018 and contributed remarkably in agrometeorological services in Tanzania. He has been a member of various National task teams related to agrometeorological services and he has also been involved in various National and Regional tasks, including the implementation of national level and regional projects. Some of the projects which he has participated in their implementation are: **“Building Capacity for Resilient Food Security” project,**

funded by USAID through USDA; **Weather and Climate Information Services for Africa (WISER)** programme phase II”, which was implemented by TMA in partnership with TMS; **“High Impact Weather Lake System (HIGHWAY)”** project; **“Global Framework for Climate Services Adaptation Programme in Africa”** -Phase I and II ; and **“Climate Adaptation Risk and Opportunities in Tanzania (CAROT)”** project.

## **Abstract**

Presentation on **“Activities of Tanzania Meteorological Society (TMS)”**, has three main parts; the introductory part (slide 3), main part (slides 4-9) and the concluding part (slide 10).

The introductory part of the presentation introduces TMS as a professional society and non-profit organization that aims at among other things; to promote the science of meteorology, hydrology, and other related fields and their applications for rapid advancement of the various socio-economic activities in Tanzania. It also indicates TMS its registration status and its current Members.

The second part of the presentation provides a **highlight of core functions of TMS** as indicated in the TMS logo, namely: “Education and Research for Development”. This part also provides a synopsis of various **general activities** that are implemented by TMS under its core functions, as well as the **activities implemented during the year 2020 and 2021**, and **achievements** of TMS. The general activities include: Organizing meetings (TMS Executive Board and General Meetings); participation in AfMS and IFMS meetings; Provision of TMS Academic Excellence Award to undergraduate meteorology students (an overall best student in BSc Meteorology and a best student in meteorological research project); Sensitization of students to pursue meteorology program at the higher learning studies; Participation in National Climate Outlook Forums for seasonal forecasts; participation in implementation of projects and programmes (e.g., WISER phase II and GFCS phase I and II); Teaching in colleges and universities; and cooperation with other organizations. Slide eight (8) has a list of TMS activities implemented during the year 2020 and 2021 whereas slide 9 shows some of TMS achievements.

The last part of the presentation is a conclusion on slide 10, which summarizes the contribution of TMS activities under its core functions in promoting the science of meteorology, hydrology, and other related fields and their applications for rapid advancement of the various socio-economic activities in Tanzania. Furthermore, the conclusion shows the vast expertise and experience gained by TMS in implementation of collaborative activities, including projects. This demonstrates TMS potential for collaboration with IFMS in implementation of its activities in Tanzania.

## **12. International Society of Biometeorology (ISB)**

**Dr. Pablo Fernandez de Arroyabe Hernaez** obtained his PhD on Geography in the area of Climatology at the University of Barcelona (UB) (Cum Laude) in research focused on the study and modelling of rainfall persistence in the Basque Country (Spain) through the use of markovian models and GIS. Between 2004-2007, he worked at Trinity College Dublin (TCD) <http://www.tcd.ie> as advisor in the TCD Bologna Project and as fulltime lecturer of undergraduate and postgraduate courses at the Geography Department at the School of Natural Science and in the Centre for the Environment at TCD.



He became member of the International Society of Biometeorology (ISB) in 2001. He founded the Climate and Human Health Commission at the ISB in 2007 and co-chaired this Commission until 2017. He has acted as member of the ISB-EB as Councillor (2008-11) and Vice-president (2011-14), President Elect for the period (2014-17) and President (2017-2020). At present he is the immediate Past President of ISB. He



is Designated Contact Point (DCP) at the United Nations Climate Change Secretariat for COP meetings and in several WMO Commissions in representation of ISB as observer.

The main research areas are climate, weather and acute respiratory diseases (mainly influenza and Covid-19), heat waves and early warning systems development based on biometeorological indexes or air pollution, atmospheric nanoparticles charge and human health. He has acted as editor, reviewer and guest editor for different journals and Special Issues related to Climate Change, Human Health, Climatology, Physical Geography and Biometeorology and published scientific articles in national and international journals from different editorial groups such as Elsevier, Springer-Nature, and Copernicus.

### **Abstract**

International Society of Biometeorology is a 60 years old scientific society formed by a group of multidisciplinary scientists (geographers, climatologists, meteorologists, biologists, medical doctors, veterinaries, phenologist, agriculture engineers... who study the interaction between atmospheric processes and living organisms.

The study of weather and climate related risks for living organism (animals, plants and human beings) has been the main goal of this society since its foundation. ISB is organised in different Commissions (Animals, Phenology, Human Health, Tourism and Recreational Activities...) being the Students and New Professional Group is perhaps the most important component of ISB. SNPG if formed by young scientists who bring to the Society new ideas and the needed energy to assure the renovations of the Society at all levels.

Tromp Foundation is always supporting ISB activities and very specially the SNPG meetings and actions. Tromp Foundation aim is promoting biometeorology world-wide.

International Congress of Biometeorology is celebrated periodically every three years and there are Commissions meetings and Conferences and capacity building actions in collaboration with other international and national scientific societies periodically.

## **13. Meteorological Society of Cuba**

**Ayón Alfonso** graduated in 1963 as Aeronautical Meteorologist in Mexico and started working as such at



the Aerop. José Martí Airport in Havana and later became Chief of the Aeronautical Meteorological Service. In 1987 he graduated in Aviation Engineering and Master of Science in the Soviet Union. Since 1967 he has participated in numerous ICAO and WMO meetings. He has been an ICAO expert in several Central and South American countries and has taught in Central America and the Caribbean. From 2001 to 2006 he was Representative of Cuba in the ICAO Council. Since 2006 he is Professor of Meteorology at the University of Havana. Vice-Secretary General of SOMETCUBA.

### **Abstract**

The presentation describes when the Cuban Meteorological Society was created, its structure, who are its members, how it works and the scientific activities it carries out; the links with other scientific, labour and university societies; and the promotion of improvement among its members. It informs about the next Convention of the Society to be held in December

## **14. Amigos del Viento – Uruguay**

**Dr. Ruben Mario Caffera** is the current President of Amigos del Viento. He works in Environmental



System Unit, School of Agronomy, Uruguayan State University, Uruguay. He is a member of the staff. He has been involved in Multi-country Study on Eco-Bio-Social Research on Dengue and Chagas Diseases in Latin America and the Caribbean UNICEF/UNDP/World Bank/WHO. His main themes are meteorology and climatology

## **ABSTRACT:**

The Friends of the Wind Society founded in 2003, has worked from the technical and professional aspect in the study of environmental issues of relevance for the mitigation and adaptation of Climate Change and Disaster Risk Management, incorporating concepts and participatory practices in education, human development, communication and environmental citizenship. Our mission is to contribute to national efforts to mitigate human and material damage caused by atmospheric and climatic phenomena, as well as the validation of meteorological knowledge and its use in daily life and in productive activities in the region. One of the fundamental aspects for our society is the role of CSOs in strengthening action at the local, regional and global levels. To meet our objectives, we carry out integrated programs that link actions related to the various frameworks and objectives at the local level from the perspective of the people and their territories. Some actions of our Society to comply with this premise are:

- Planned actions at the local level - Joint Design of Actions
- Implementation of actions to monitor the progress at the national and regional level of the environmental and climate agendas
- Work in a framework of Cooperation and coordination with other actors
- Creation of alliances - Increased collaboration
- Participation, education and prevention from weather
- The integration of academic scientific knowledge plus the knowledge, experiences and daily practices of the population, social organizations and the government.

Organizations involved in creating a "Weather Ready Globe"				
Weather & Water Related Organizations				
<b>Beneficiary</b>	National Meteorological Services	National Meteorological Societies	HydroMet Equipment Industry	World's Least Developed & Developing
<b>Financed by</b>	UN	<b>Donations</b> (Volunteer-Based)	Industry	World's Richest Nations

## PRESENTERS



**Mr. Luke Stacy**  
President MSNZ (New Zealand)



**Dr. Marcelino Villafuerte**  
President PMS (Philippines)



**Mr. Deepak Paudel**  
Vice Chair SOHAM 'Nepal



**Dr. D. R. Pattanaik**  
Secretary IMS (India)



**Prof. (Dr.) Sushil Dash**  
Past President IMS (India)



**Prof. Nigel Tapper**  
President IAUC



**Dr. Buruhani Nyenzi**  
President AfMS



**Dr. Buruhani Nyenzi**  
President TMS (Tanzania)



**Dr. Roger Dargaville**  
VP. AMOS (Australia)



**Dr. Chian-Yi Liu**  
General Secretary MSCT

# IFMS Global Meeting #7

## Session 1B Eastern Half of Globe

### Get to know activities of your Sister Societies

On November 18, 2021 at 12:00 (mid night New York) - 5:00 UTC

## PANELISTS

## SESSION 1B:

### **General Information by Sushil Dash as Moderator of Session 1B**

IFMS is an active Forum for discussion on important issues of mutual interests of NMSocs. There are several important issues relating to weather and climate science which should reach the people at large. However, we need to be selective in our approach by means of discussion and brain storming among the NMSocs. To start with, we should know the mutual interests of our member societies. This platform is meant for that type of discussion to start with.

As requested by Dr. Ahluwalia earlier, we were expecting about 5-6 power point slides from each of the representatives of NMSocs mentioning the annual events organized by NMSocs out of which they were advised to specify 2-3 important programs with some details. We had advised the presenters to present their outreach programs which are beneficial to their society and how IFMS involvement could further the current activities of their society. Finally, presenters were asked to kindly enumerate the future plan of activities of their society. As we know, due to limited time, each presenter got about 5-10 minutes and hence they were able to dwell on the important activities of their society.

Questions were left for the Q&A period after all presentations were completed. After the end of all the presentations and Q&A period, selected key points during presentations were summarized by Dr. Dash and Dr. Buruhani. Thereafter, discussion was solicited from the audience on issues like: Where do we go from here? What are the priorities recommended for IFMS? Ideas for addressing key priorities and what contributions are societies willing to make? However not much time was left for detailed discussion.

### **Moderators**

- A. **Dr. Sushil Kumar Dash** is currently the immediate past-President of the Indian Meteorological Society (IMS) and Council Member for WMO Region II, in the International Forum of Met Societies (IFMS). Formerly he was Professor and Head of the Centre for Atmospheric Sciences at the Indian Institute of Technology Delhi (IITD). At present he is engaged in his R&D activities in IITD as part of the DST Centre of Excellence in Climate Modelling and three more important projects. Prof. Dash is a Fellow of the Royal Met Society and that of the IMS. In addition, he is Life Member and Member of a number of international bodies such as the American Meteorological Society, US and the National Academy of Sciences, India.



- B. **Dr. Buruhani Nyenzi** is the Vice-President-Administration of IFMS. He is also the President of the Tanzanian Meteorological Society. The former late President of the United Republic of Tanzania H. E. Dr. John Pombe Magufuli reappointed Dr. Buruhani Nyenzi to Chair the board of directors of the Tanzania Meteorological Authority (TMA) for four years with effect from 18 November 2019. Recently he has been selected to lead the process of establishing the African Meteorological Society. He is a retired Senior International Civil Servant Meteorologist from the World Meteorological Organization, a specialized UN Agency where he worked for about ten years from 2000 to 2010. During that assignment he served the World Meteorological Organization (WMO) in different capacities which included Chief of the Climate Applications and Prediction Services (CLIPS) project; Director, World Climate Programme (WCP); Director of the Climate Prediction and Adaptation



Branch; Director and Secretary of the World Climate Conference -3 Secretariat and Special Advisor to the Director, WMO Climate and Water Department; and Manager (Consultant) to the High-Level Taskforce on the Global Framework of Climate Services (GFCS). He has also served other international organizations such as the IPCC, UNFCCC, World Bank, SADC, UNECA, and African Development Bank in relevant various research activities.

## 1. Meteorological Society of New Zealand (MSNZ)

[Luke Sutherland-Stacey](#) is the president of the Meteorological Society of New Zealand. Apart from Society duties, Luke is an Early Career Researcher and owner of an independent research consultancy leading the science development and implementation of radar QPE and nowcasting systems for local government stakeholders in New Zealand, along with the operation and development of a novel radar profiler observation network.



### Abstract:

The Meteorological Society of New Zealand is an independent group of weather enthusiasts with the stated aim to encourage an interest in the atmosphere, weather and climate, particularly as related to the New Zealand region. Membership of about 220 is drawn from New Zealand's national weather service (MetService), government weather and climate research organization (The National Institute of Water and Atmosphere- NIWA), universities, private companies and weather enthusiasts. The Society arranges regular public meetings, organizes an annual conference, publishes an annual journal and a quarterly newsletter reporting on the latest developments in meteorology and climate.

## 2. International Association for Urban Climate (IAUC)

### Professor Nigel James Tapper - President IAUC

Until 2020, Nigel held a Personal Chair in Environmental Science (as a climate science specialist) within the School of Earth, Atmosphere and Environment at Monash University where he led the urban climate research program. He retired in December 2020 and is now Professor Emeritus at Monash University. Under Nigel's leadership at Monash the Urban Climate Group led Australian urban climate research activity developing the Australian capital city heat vulnerability assessment, the Victorian heat watch warning system, and the TARGET and VTUF-3D urban models to name a few of many achievements. Outside of the University, Nigel has contributed strongly to the work of the Intergovernmental Panel on Climate Change where he is a Lead Author of Working Group II, Impacts, Mitigation and Adaptation. He serves in the World Meteorological Organization as a member of the Terrestrial Observation Panel on Climate and is Co-Chair of the GCOS Adaptation Task Team for the 2023 UNFCCC Global Stock take. He is currently President of the International Association of Urban Climate, that represents the interests of >1000 urban climate scientists worldwide. Nigel has published seven books, 15 book chapters and more than 200 refereed research publications, and has supervised >60 Ph.D. students to completion, in an academic and research career spanning 40 years. He co-authored the classic text on Australasian climate – The Weather and Climate of Australia and New Zealand. Key research in recent years has been in the area of weather and climate impacts, including on fire, urban environments and human health-climate interactions. A strong climate change adaptation theme has emerged in his research, especially in relation to urban environments and human health. Nigel has a particularly strong track record in delivering industry-relevant research.





### **Abstract:**

Nigel provided a short overview of the IAUC which is a highly collaborative scientific society representing a diverse group of more than 1000 scientists and practitioners around the world with interests in urban climate and meteorology. It was formally established in 2000 following a number of successful international urban climate conferences. Its membership is free and its Executive, its Board and its various committees are staffed by volunteers. Its activities are funded as necessary by legacy funding from its highly successful International Conference on Urban Climatology that is held every 2-4 years. The IAUC also supports a very popular and comprehensive Newsletter and sponsors various workshops on request. The IAUC is active in promoting the importance of urban climate/meteorological research internationally, especially through the work of WMO and the IPCC. It has a well-developed awards system with separate awards for early-mid career researchers as well as more senior researchers.

### **3. Australian Meteorological and Oceanographic Society (AMOS)**

**Dr. Roger Dargaville** has been an AMOS member since beginning his PhD in 1993, and currently is the AMOS Vice President. He did his PhD under Prof Ian Simmonds in the School of Earth Sciences at the University of Melbourne in the field of atmospheric tracer transport and applications for inversion modelling of the global carbon cycle. He postdoc'ed in the US at University of Alaska (Fairbanks) and the National Center for Atmospheric Research (Boulder), and then in France at the Laboratoire des Sciences de l'Environnement, all on various aspects of the global carbon cycle.



Roger took a new direction in his career with a posting at the International Energy Agency in Paris where he began working on the nexus between weather and energy systems, in particular on how to design large-scale (continental) renewable energy systems. He has continued that work back in Australia, first at the Melbourne Energy Institute and currently at the Monash University Civil Engineering department and the Monash Energy Institute. Roger has a passion for sharing knowledge, both as a lecturer (running the Renewable Energy degree) and writing for mainstream media such as The Conversation.

### **Abstract:**

The Australian Meteorological and Oceanographic Society (AMOS) is an independent society representing the atmospheric and oceanographic sciences in Australia. It currently has over 500 members drawn from the Bureau of Meteorology, CSIRO, the university sector, other State and Federal agencies, as well as the private sector. Most members of AMOS are actively employed in one of the scientific fields covered by the Society, but the membership also includes university students, retired scientists, schoolteachers and others from the general community with an interest in weather and climate.

AMOS provides support for and fosters interest in meteorology and oceanography through its publications, meetings, workshops, public events, grants and prizes. Many of these activities are conducted by the AMOS Regional Centres, which have been established in each state and territory. The annual AMOS National Conference regularly attracts more than 400 attendees, making it the leading forum in Australia for presenting the latest research in atmospheric and oceanographic science. The Bulletin of AMOS (BAMOS; published quarterly) is the best place to keep up-to-date with the latest news in the community, while the Journal of Southern Hemisphere Earth Systems Science (which AMOS publishes in partnership with the Bureau of Meteorology) is a great option for those looking to publish scientific papers in the AMOS sciences.

AMOS also has an important role as a credible, independent voice for the profession. As part of this role, it has established Expert Groups in areas such as climate variability, weather forecasting and physical oceanography and regularly represents the views of its members to Government, institutes and the public. You can learn more about the society at <https://www.amos.org.au/>.

#### 4. Society of Hydrologists and Meteorologists (SOHAM) of Nepal

**Mr. Deepak Paudel** is the Vice-Chairperson currently holding a position of Managing Director cum Disaster Risk Management Expert at Nature's Conservation ([www.naturesconservation.org](http://www.naturesconservation.org)) in



Kathmandu. Mr. Paudel has completed his higher education in multidisciplinary subjects (Master degree in Meteorology from Tribhuvan University (TU), Post Graduate in Hydrology with Watershed Management specialization from IIT Roorkee, India and Master degree in Social Science-Rural Development from TU.

Mr. Paudel has 15 years plus experiences in policy formulation, planning & methodology, training facilitation and research works in several sectors especially in Hydro-meteorological hazards-disaster risk management (DRM), Climate Change Vulnerability & Adaptation and Watershed Management & Ecosystem Services. He has also worked in Thailand and Shri-Lanka as a trainer of DRM. He is voluntarily involved in different civil social organizations and network including Society of Hydrologists and Meteorologists - General Secretary (2011 – 2014); Disaster Preparedness Network-Treasurer (2013-2015); and Natural Disaster Management Forum Nepal -Founder Chairperson.

#### 5. Philippine Meteorological Society (PMS)

**Dr. Marcelino Q. Villafuerte II** is the current President of the PMS. After completing his Master of Science in Atmospheric Science degree from the Ateneo de Manila University, he joined the Philippine



Atmospheric, Geophysical and Astronomical Services Administration (PAGASA) as Weather Specialist 1 in 2010. He pursued graduate studies and obtained his PhD degree specializing in climatology from the Tokyo Metropolitan University in 2014. He is a member of scientific organizations including the American Meteorological Society, Japan Geoscience Union, and National Research Council of the Philippines. He was recently conferred Scientist 1 and currently heads the

Impact Assessment and Applications Section of the Climatology and Agrometeorology Division, PAGASA.

##### **Abstract:**

In 1952, the Philippine Meteorological Society (PMS) was established by a group of Filipino Meteorologists, who just returned to the country after doing their graduate studies from the United States. The main objective of the society was to promote the science of meteorology in the Philippines. Since then, several activities have been conducted by the PMS. These include the annual convention highlighting recent progresses and achievements in the field of weather and flood forecasting, hydrology, climate science, and the role of meteorologists in disaster risk reduction and management in the country. The PMS is also active in conducting information and education campaign involving students, teachers, and the public to its different activities. It has also partnered with government and non-government agencies for various outreach programs. It further aims to widen its network by strengthening its partnership with international organizations such as the IFMS, meteorological societies of its neighboring countries and geosciences union.

## 6. India Meteorological Society

**Dr. D. R. Pattanaik** obtained his B. Sc degree in Physics from Sambalpur University, Odisha in 1989 securing 1<sup>st</sup> position in the University. He completed M. Sc and M. Phil in Physics and subsequently M.



Tech in Atmospheric Sciences from Pune University in 1995. He worked as Research Scholar in Indian Institute of Tropical Meteorology (IITM), Pune and obtained his PhD from Pune University in 2001 for his thesis titled “**Modelling of the Moist Convection over the Monsoon Region**”. While continuing for his PhD, he joined India Meteorological Department (IMD) in June 1998 as Meteorologist Gr. II. At present he is working as the Head of the Numerical Weather Prediction Division of IMD.

Dr. Pattanaik has made significant contributions in implementing **coupled (Atmosphere-Ocean) modelling** system in IMD and its operationalization for generation of meteorological sub-divisional level extended range forecast of monsoon, temperature, cyclogenesis etc. He has been engaged in research work in the areas of: Monsoon variability, monsoon forecasting, extended range forecasting and extreme weather events (heavy rainfall, heat wave/cold wave, cyclones etc.), climate variability, climate change etc. He has published about 75 research papers in peer reviewed international/national journals and also contributed many chapters in books.

Dr. Pattanaik's persistent scientific contributions brought him much recognition and award, like

- (i) Certificate of Merit for outstanding contribution in the field of Atmospheric Science & Technology by the Ministry of Earth Sciences, Government of India in 2011 and
- (ii) Young Scientist Award for the best research paper published in Tropical Meteorology for the years 2014 by Indian Meteorological Society (IMS).

At present he is the Secretary of Indian Meteorological Society (IMS) and he has been involved in organizing many national and international workshop/seminars.

### **Abstract:**

The Indian Meteorological Society (IMS) was established in 1956 during the Session of the Indian Science Congress. At present IMS has enrolled more than 3500 members as its Life Member. The society has its head Quarter in Delhi with 32 chapters spread across the country. The society is a non-profit organization and none of its income or assets shall accrue to the benefit of its members. The constitution is available at IMS website at the following URL: <http://www.imd.gov.in/ims/>

The main objectives of the society are:

- Advancement of Meteorological and allied sciences in all their aspects.
- Dissemination of the knowledge of such sciences both among the scientific workers and among the public.
- Application of Meteorology and allied sciences to various constructive human activities, such as, agriculture and land uses, irrigation and power development, navigation of sea and air, engineering and technology, medicine and public health etc.

Persons of acknowledged eminence in Meteorology and allied fields of Science and Technology or in their furtherance may be elected as honorary fellows by the General Body on proposal from the Council. Life members, who have made outstanding contribution of Meteorology and allied fields of Science and Technology, may be elected as Fellows by the General Body on proposal from the council. As of now 56 distinguished scientists have been awarded as IMS Fellow, whereas 18 scientists of international repute have been awarded with Honorary Fellows for their outstanding contributions.



A number of awards have been instituted by IMS to encourage scientists from various disciplines of Atmospheric and Allied Sciences.

To popularize Meteorology and Atmospheric Sciences, the Indian Meteorological Society (IMS) brings out the Research journal “Vayu Mandal”, which is the official Bulletin of IMS. This is brought out twice a year since 1971 to encourage research work and provide information on latest developments in the atmospheric sciences.

## 7. African Meteorological Society

Dr. Buruhani Nyenzi made this presentation.

### Abstract

The European Meteorological Society (**EMS**) is very successful in uniting the NMSocs of Europe and creating collaborations to build capacity in Europe. Since only NMSocs can become members of Regional Meteorological Societies, we believe that some European countries which did not have NMSoc created one to partake in the benefits provided by EMS.



Africa is in dire need of Capacity Building in its constituent nations to withstand the negative impacts of the GW&CC. WMO, African NMHS and WB are working on this aspect. However, due to limited resources a Volunteer-based organization can be of great help to these organizations.

Taking cue from the very strong contribution which EMS – a volunteer-based organization - is making in Europe, IFMS decided to assist Africa to re-create the African Meteorological Society (**AfMS**) which once existed but failed due to many reasons. This Society has been recreated in the year 2021 and is currently being registered in Addis Ababa where its headquarters will be located. Every effort will be made by IFMS to sustain AfMS. The idea is for AfMS to strongly assist WMO, WB and COMET to build capacity in African Nations. In order to participate in the activities of AfMS, all African Nations need to have an NMSoc; otherwise, they will miss out on the strong contribution which AfMS is expected to make to African Capacity Building. Africa consists of 57 nations out of which only 10 are known to have an NMSoc. Therefore, we are strongly urging rest of the countries to create an NMSoc in their nation and IFMS and eventually AfMS will assist them strongly in this mission. Dr. Buruhani highlighted these points and participate in Q&A.

## 8. Meteorological Society of Chinese Taipei

Dr. Chian-Yi Liu

Dr. Liu received the Ph.D. degree from the Department of Atmospheric and Oceanic Sciences, University of Wisconsin–Madison, Madison, WI, USA, in 2010. He was involved in the atmospheric sounding retrieval algorithm development team. He is currently an Associate Professor with National Central University, Taoyuan, Taiwan. He is also involved in the cloud microphysical parameter retrievals, cloud-to-precipitation processes, and the relationship to the environment. His research interests include meteorological satellite remote sensing, high-impact weather remote sensing, and the application of satellite data in numerical weather prediction by using the data assimilation technique. He is the current Secretary, Taiwan Meteorological Society



### Abstract

The mission of MSCT (Taiwan) is to study meteorological science, exchange meteorological knowledge, and promote the progress of meteorological science.



Current members: ~150 (individual member) and ~30 (business/university/group member)

The conference/seminar/workshop affairs organized by MSCT are as the following:

1. Research on meteorological academics;
2. Introduction and exchange of meteorological knowledge and experience;
3. Recommendations for the development of meteorological services;
4. Communication among domestic meteorological academic institutions or groups.

#### **Current Activities**

1. Holding annual meeting every March regularly.
2. Holding virtual meeting every year regularly.
3. Newsletters are released every year, providing relevant information and news.
4. Publish journal on atmospheric sciences.
5. Award scholarships to students or outstanding researchers.
6. Cooperate with other meteorological organizations to conduct lectures or activities for general public.
7. Podcasting
8. CSR and NetZero with company and industry.



### Organizations involved in creating a "Weather Ready Globe"

Weather & Water Related Organizations				
<b>Beneficiary</b>	National Meteorological Services	National Meteorological Societies	HydroMet Equipment Industry	World's Least Developed & Developing
<b>Financed by</b>	UN	Donations (Volunteer-Based)	Industry	World's Richest Nations

### IFMS VALUE PROPOSITION

1. **IFMS Uniting and coordinating the activities of National Meteorological Societies (NMSocs) & Associated Societies**
2. **Creating S&T Collaboration between NMSocs**
3. **Creating capacity through Webinars, Education & Training**
4. **Assisting in creating new Societies**
5. **Helping NMSocs in understanding new concepts such Global Weather Enterprise, WMO-OCP Global Campus & WB-GWEP, etc.**
6. **Sharing Best Practices, guiding Certification/ Accreditation Processes,**
7. **And much more – Visit: [www.ifms.org](http://www.ifms.org)**

## IFMS Global Meeting #7 Session 2 Education & Training

### PRESENTER



Dr. Harinder Ahluwalia  
IFMS - President

### MODERATOR



Dr. Sushil Dash  
IFMS Chair - E&T and Webinars

### PANELISTS



Dr. Elizabeth Page  
Director  
COMET PROGRAM



Dr. Ajit Tyagi  
Chairman- SAMA



Dr. Buruhani Nyenzi  
Vice President  
IFMS



Dr. Harinder Ahluwalia  
IFMS - President

## **IFMS GLOBAL MEETING/CONFERENCE #7 – 2021: SESSION 2**

**November 24, 2021 (Wednesday)**

### **IFMS EDUCATION & TRAINING PROGRAM & CREATION OF NMSocs**

**One of the major objectives of IFMS is to assist WMO, NMHSs, WB, COMET, etc. in building capacity through Education and Training (E&T).**

#### **Introductions**

Capacity Building through E&T is the mandate of the above-mentioned organizations. In addition, Universities educate and train people working in the field of meteorology and hydrology. However, due to limited financial and manpower resources, they could use external help. Volunteer-based organizations like IFMS, Regional Meteorological Services and National Meteorological Societies (**NMSoc**) can assist in this endeavor.

The purpose of this second Session of IGM/C-07 was to have a Panel constituted by experts to determine how best IFMS can contribute to the Global Weather Enterprise (**GWE**) in Capacity Building through E&T. Since the NMSoc are closest to the professionals in their country and they are the ones who assist IFMS in fulfilling this Value Proposition, we believe that all countries should have an NMSoc. There are 193 states which are members of WMO and there are only approximately 72 NMSocs. Therefore, our goal is to create an NMSoc in each of the remaining countries. Session 2 started with a presentation on “How to create an NMSoc”.

#### **Presentation on “How to Create an NMSoc”**

##### **Presenter**

**Dr. Harinder P. S. Ahluwalia** is the President of the International Forum of Meteorological Societies (**IFMS**) which aims at creating collaboration between the National Meteorological Societies of the world



to leverage each other's strengths. Previously he was the President of the Canadian Meteorological and Oceanographic Society (**CMOS**). He is also the President and CEO of Info-Electronics Systems Inc. (**IES**) based in Montreal with an office in New Delhi. Incorporated in 1981, IES is a systems engineering, development and implementation company in Hydrometeorology, Remote Sensing and environment monitoring. Dr. Ahluwalia has been a member of the National Round Table on Environment and Economy advising the Government of Canada on Sustainable Development issues. He is a strong proponent of PPP model for weather business as well as cooperation between nations to achieve optimum results in this border-less issue - weather. He has won many awards for his outstanding contribution to Canada and hi-tech industry. He is a member of many societies and is a Fellow of CMOS. He has published a number of papers/articles in Meteorology and Electromagnetics.

##### **Abstract:**

This presentation outlined the advantages of a National Meteorological Society, and a suggested formal process for establishing it. Frequently such societies grow out of a recognised need for a forum that allows



members of different occupationally based institutions such as National Meteorological and Hydrological Services (NMHSs), academia and private sector organisations to exchange ideas and cooperate on a wide range of research and operational activities. Additionally, the occupational institutions can draw many advantages from the activities of such societies e.g., through the promotion of meteorology and its related professions, and the capacity for societies to tap into the broader community affected frequently and in multitude ways by the vicissitudes of weather and climate.

To support the development of nascent National Meteorological Societies, the International Forum of Meteorological Societies can provide a wealth of knowledge and experience by drawing from its member societies. In addition, in order to take advantage of the services provided by Regional (EMS, FLISMET and AfMS) and International Societies like IFMS, you must have an NMSoc in your country. Given the activities of the Regional and International Meteorological Societies which they are prepared to share as well as those of other NMSocs, even the smallest country can have an NMSoc. It is also facilitated by the existence of the modern means of conducting Meetings, Webinars Conferences and Training Courses.

### **Moderator**

**Dr. Sushil Kumar Dash** is currently the immediate past-President of the Indian Meteorological Society (IMS) and Council Member for WMO Region II, in the International Forum of Met Societies (IFMS). Formerly he was Professor and Head of the Centre for Atmospheric Sciences at the Indian Institute of Technology Delhi (IITD). At present he is engaged in his R&D activities in IITD as part of the DST Centre of Excellence in Climate Modelling and three more important projects. Prof. Dash is a Fellow of the Royal Met Society and that of the IMS. In addition, he is Life Member and Member of a number of international bodies such as the American Meteorological Society and the National Academy of Sciences, India.



### **Opening Remarks by Prof. Dr. Sushil Dash**

For the last one year, IFMS has been making all efforts to focus on E&T activities by taking necessary steps for extensive discussions in its Council meetings, arranging Webinars, forming E&T team, conducting survey etc. One article in NL6 narrates E&T requirements on various aspects of weather and climate.

National Meteorological Societies (NMSocs) have a very important responsibility to educate and hence create awareness among all sections of the society so as to cope with the climate change related issues. Several organisations including some of the NMSocs have already launched important E&T programmes. IFMS, in the recent past conducted a detailed survey among its member societies with the objective of getting information about their continuing E&T programmes based on which IFMS can make strategies for launching an effective programme for the benefit of the society at large.

IFMS should prioritize on the topics where its member societies will gain. The two important ones are Teachers and Students Training and Outreach Programmes on Climate Change and Extremes. In the session we had five eminent panelists: Dr. Liz Page, Director COMET; Dr. Buruhani Nyenzi, President of the Tanzanian Meteorological Society; Dr. Ajit Tyagi, President SAMA, Dr. Harinder Ahluwalia, President of IFMS and Prof. Oscar Frumento, IFMS Council Member for RA3. We wanted to listen to their views and views of the attendees which will help IFMS in chalking out our future course of action in E&T.

1. **Dr. Elizabeth (Liz) Page** became the COMET Director in July 2017. She has spent much of her career



dedicated to the professional development of operational meteorologists worldwide. Liz joined COMET in 1993 as a visitor from the National Weather Service and became a COMET Associate Scientist in 2004 and later a Project Scientist. More recently, she led COMET's education and training operations and the business office.

She began her career as a civilian instructor with the Air Force's Weather Training Division at Chanute AFB, IL. Liz next joined the National Weather Service as an intern in San Diego, CA and moved to become the Deputy Meteorologist in Charge at the NWS Agriculture and Fire Weather Office in Riverside, CA before joining the NWS team at COMET. She has also taught courses at North Carolina State University and University of North Carolina, Charlotte.

Liz received her BS in Atmospheric Science from the University of California, Davis and her MS and PhD in Atmospheric Science from Colorado State University, where she studied cloud physics and microclimate effects of wildfire burn scars, respectively. She was awarded two NOAA Bronze Medals and was recognized with an American Meteorological Society Special Award for her contributions to the Certified Broadcast Meteorologist test and study guide. Liz has served on the National Weather Association (NWA) Council in different capacities and was President in 2015. She is currently a founding member of the Board of Directors of the NWA Foundation, the charitable branch of the organization. Liz is also the chair of UCAR Management Forum (UMF).

### **Opening Remarks by Dr. Liz Page, Director COMET**

National Meteorological Societies bring expertise in the science with an understanding of the unique needs of the countries and region that they serve. Training for the regional needs include the climatology and the unique forecasting challenges faced by those providing weather services and conducting research. The NMSocs are in a position to provide networking with colleagues and stakeholders as well as mentoring for earlier career scientists and forecasters and those in developing nations.

A wealth of training resources already exists through sources such as the WMO Global Campus, the EUMeTrain portal, and the MetEd portal. The NMSocs can help adapt these resources for their locations and apply them to the challenges of their regions. Regional case studies can be very effective in helping forecasters implement new technology and forecasting techniques. Courses can also be developed by volunteers from the societies that address the unique needs related to capacity building. These courses could lead to certifications by the society on topics of interest or areas that need a recognized level of competency. The IFMS is well positioned to facilitate sharing of resources, expertise and training workshops across a region and internationally.

2. **Dr. Buruhani Nyenzi** is the Vice-President-Administration of IFMS. He is also the President of the



Tanzanian Meteorological Society. The former late President of the United Republic of Tanzania H. E. Dr. John Pombe Magufuli reappointed Dr. Buruhani Nyenzi to Chair the board of directors of the Tanzania Meteorological Authority (TMA) for four years with effect from 18 November 2019. Recently he has been elected to lead the process of establishing the African Meteorological Society. He is a retired Senior International Civil Servant Meteorologist from the World

Meteorological Organization, a specialized UN Agency where he worked for about ten years from 2000 to 2010. During that assignment he served the World Meteorological Organization (WMO) in different capacities which included Chief of the Climate Applications and Prediction Services (CLIPS) project; Director, World Climate Programme (WCP); Director of the Climate Prediction and Adaptation



Branch; Director and Secretary of the World Climate Conference -3 Secretariat and Special Advisor to the Director, WMO Climate and Water Department; and Manager (Consultant) to the High-Level Taskforce on the Global Framework of Climate Services (GFCS). He has also served other international organizations such as the IPCC, UNFCCC, World Bank, SADC, UNECA, and African Development Bank in relevant various research activities.

### **Opening Remarks by Dr. Buruhani Nyenzi**

The main objective of IFMS is to strengthen international Cooperation in Science and Technology (**S&T**) and to help National Meteorological Societies (**NMSocs**) and Regional Meteorological Societies (**RMSocs**), especially in developing and least developed countries, to become stronger so that they can contribute effectively in the capacity development of their countries. In order to achieve this objective, IFMS has established its committee that guides it on what are the relevant activities to be implemented for capacity building in E&T and which parts of world and countries need more help. The committee has identified areas in which IFMS, in collaboration with other partners including WMO, WBG, COMET and others, can support NMSocs and RMSocs to become stronger so that they could help their countries more effectively. These activities among others include the following:

- Collaboration in science and technology;
- Strengthening NMHSocs and RMSocs around the world especially in developing and least developed countries;
- Capacity Building of members of NMHSocs and RMSocs through Webinars and Training Programmes
- Sharing best practices; and
- Others

Through these efforts IFMS has been able to hold webinars, meetings and conferences with NMSocs on various issues related to capacity strengthening and development. Effort has been made to carry out gap analysis to guide us in which areas IFMS needs to help the NMSocs. It is clear that Africa and other developing and least developed countries will benefit greatly from these efforts of IFMS.

### **3. Dr. Ajit Tyagi** has served as Assistant Chief of Air Staff (Meteorology), Director General of



Meteorology. He is Koteswaram Chair Professor, Ministry of Earth Sciences, New Delhi. He has carried out research work at Indian Institute of Technology, New Delhi and Indian Institute of Tropical Meteorology, Pune. Dr Tyagi was instrumental in introducing Numerical Weather Prediction and initiating modernization of aviation meteorological services in IAF. As DGM, Dr Tyagi successfully implemented the first phase of IMD modernization covering observations, communication, data processing, forecasting and dissemination. This led to significant improvement in the quality of

Weather Forecasts and Warnings of cyclones and heavy rainfall and fog. Under his leadership, Agro Advisory Services were extended to 640 districts and Nowcast system was implemented during Commonwealth Games 2010. Dr Tyagi has been associated with STORM, BOBTEx and CTCZ field programmes. He has served on various committees of MoES, ISRO, DST, MoEF, NDMA, MoWR.

Dr Tyagi has served as Chairman of Governing Council of SAARC Meteorological Research Centre Dhaka, member of Governing Council Indian Institute of Tropical Meteorology, Pune and Indian Institute of Astro-physics Mumbai and member of Scientific Advisory Committee of National



Atmospheric Research Laboratory, Gadanki and member of Executive Council of World Meteorological Organisation

Dr Tyagi was Permanent Representative of India with WMO during 2009-2013 and started South Asian Climate Outlook Forum (SASCOF). He participated in deliberations of World Climate Congress-3 and as a member of Executive Council Task Team played active role in formulation of Global Frame Work for Climate Services, and constitution of Inter Governmental Board. Dr Tyagi is currently a member of WMO Monsoon Panel.

Dr Tyagi served two terms as Vice President and is associated with various forums to promote meteorology including facilitating cooperation with American and Canadian Met Societies. He assisted Pune Chapter in organizing Training Workshops for Teachers and Media. Dr Tyagi is actively involved in the planning of Rain Museum at Cherrapunji. He has started e-magazine "Climate" to popularize meteorology amongst students and general public.

AVM Tyagi has been conferred with Vishistha Sewa Medal by President of India for his distinguished services and leadership.

#### **Opening Remarks by AVM (Dr) Ajit Tyagi, Chairman, SAMA**

South Asian Region comprising of countries of varied sizes ranging from country of sub-continent size to small island county at different levels of competency. Some of the countries have limited trained manpower and meteorological infrastructure. South Asian Meteorological Association (SAMA) has been formed to enhance competence and capability of these countries by promoting regional cooperation and collaboration. The SAMA has been conducting monthly Webinars on topics of regional importance. Capacity development has been identified as one of the key objectives of the SAMA. It will be achieved by structured Training and Education Programmes for personnel from meteorological department, user sectors and general public. Some countries do not have Universities/colleges offering courses in Meteorology/Atmospheric Sciences. The SAMA has plans to develop online courses for these countries. The SAMA has also started Student membership to assist them with master classes by experts on latest topics. The aim is to develop human resource in South Asian countries and assist them in the formation of National Meteorological Societies. The SAMA looks forward to IFMS to provide necessary assistance in developing Training Programmes and achieving common goal of the formation of National Meteorological Societies in South Asian countries.

#### **4. Dr. Harinder Ahluwalia – please see the bio in the beginning of this document.**

#### **Opening Remarks by Dr. Harinder Ahluwalia**

Two important ingredients for accurate weather forecasting are infrastructure and knowledge base. At least a basic infrastructure is a must and data collected from it can be used in conjunction with Satellite Data for adequate weather forecasting. The development of the knowledge-base requires Education and Training in Meteorology. The developed countries have means to be able to fulfil this requirement. However, many developing countries and least developed countries find it hard to create knowledge-base because of lack of universities or institutions delivering education in meteorology in their country and also lack of funds to travel to other Training Institutes outside the country.

With Global Warming and Climate Change (GW&CC), many disasters are happening and their frequency and intensity are expected to increase. In order to get out of harm's way, Early Warning Systems based on impact forecasting are becoming very important.



Many sources of education are now available which include Global Campus Initiative of WMO, courses offered by ECMWF, COMET, etc. There are also courses provided by Regional Training Centres of WMO around the world. It is the intention of IFMS to centralize the information about courses as to what courses are available and through which organization. Instead of each NMHS or NMSoc doing this work on its own, IFMS would like to coordinate this activity and achieve the objective optimally. However, the kind cooperation of the NMHSs and NMSocs will be required to achieve this.

We discussed the issue of doing a gap analysis between what is required and what is available and how the gap can be filled. We also explored the requirements of Teacher and Students training and how they can be achieved. This will result in a list of courses which might be required to be developed and what are the possible means of achieving this development.

Available modern means of having online courses and online meetings, webinars and conferences make it easier to build capacity. This needs to be explored fully.

Another important capacity building aspect is in the area of Institutional Capacity and Societal Capacity. This aspect is crucial because the best forecasts will be of no value if the ultimate users which are Public and ultimate provider which are Emergency Management people are not fully trained about how to use the generated information.

5. **Prof. Oscar Frumento** is a Professor of Climate System, Faculty of Natural and Health Sciences, National University of Patagonia San Juan Bosco, Puerto Madryn, Argentina.



Principal Professional Officer and Head of the Climatology Laboratory at the Centre for Studies of Maritime Systems (CESIMAR), CCT-CENPAT, National Council of Science in Puerto Madryn, Argentina. Experience in regional climate modelling and dust transport; design of local and regional surface observing networks.

Member of the CESIMAR CD by the professional and technical staff (2016-present)

Climatology advisor for the early warning system for bushfire (in association with INTA, National Institute of Agricultural Technology, Trelew, Argentina).

Contributor to the Argentine Third National Communication to the UNFCCC. *Climate of Patagonia* (2013-2014).

### **Opening Remarks by Prof. Oscar Frumento**

Education and Training in Meteorology is a very ample topic, probably like in many other sciences, but the difference is that a) there are few specialists in Latin American countries, a small number of institutions delivering education and almost no outreach to the general public, stakeholders or even high school teachers and students and b) important changes are taking place within NMHSs services.

Problems related to climate change, which have a very high impact on the society at large, have highlighted the great need to educate on weather and climate, as requested by society itself. For example, the users of meteorological, climatological and hydrological services are expecting the NMHSs to provide impact-based forecasting services rather than the traditional services that outline the state of the meteorological variables and leave it up to the user to infer the impact of the weather, climate or hydrological event on their activities. Increasingly users are also requesting that they receive training in the use of meteorological and hydrological products and data i.e., training is needed for both users and providers. This is a worldwide problem. A possible solution proposed by WMO is Global campus, a collaborative network of institutions that share education and training materials, staff and technical expertise, and provide cost-effective education and training services for meteorology, hydrology, and climate services. IFMS is planning to leverage that for its members.

Organizations involved in creating a "Weather Ready Globe"				
Weather & Water Related Organizations				
<b>Beneficiary</b>	National Meteorological Services	National Meteorological Societies	HydroMet Equipment Industry	World's Least Developed & Developing
<b>Financed by</b>	UN	<b>Donations</b> (Volunteer-Based)	Industry	World's Richest Nations

### IFMS VALUE PROPOSITION

1. **IFMS Uniting and coordinating the activities of National Meteorological Societies (NMSocs) & Associated Societies**
2. **Creating S&T Collaboration between NMSocs**
3. **Creating capacity through Webinars, Education & Training**
4. **Assisting in creating new Societies**
5. **Helping NMSocs in understanding new concepts such Global Weather Enterprise, WMO-OCP Global Campus & WB-GWEEF, etc.**
6. **Sharing Best Practices, guiding Certification/ Accreditation Processes,**
7. **And much more – Visit: [www.ifms.org](http://www.ifms.org)**

## IFMS Global Meeting #7 Session 3 IFMS Value Proposition

### MODERATOR



**Dr. Jack Hayes**  
Retd. Director of NWS  
IFMS – R4 Rep

### PRESENTER



**Dr. Harinder Ahluwalia**  
IFMS - President

### PANELISTS



**Dr. Walter Dabberdt**  
Psat President AMS



**Mr. Vladimir Tsirkunov**  
Team Leader - WBG  
Hydromet Program



**Mr. Michel Jean**  
President – CBS - WMO



**Mr. Tatsuya Kimura**  
Head OCP - WMO



**Dr. Buruhani Nyenzi**  
Vice President  
IFMS

# IFMS GLOBAL MEETING/CONFERENCE #7 - 2021

## SESSION 3: December 1, 2021

### IFMS VALUE PROPOSITION

*IFMS has been created to unite all National Meteorological Societies of the world to achieve more than they could individually.*

#### Introduction

In the past most National Meteorological and Hydrological Societies worked on their own and some of them created bilateral cooperation with other Societies. When industry wanted to have a say in WMO affairs, they were asked to form an Association and participate in WMO deliberations as an observer. Today WMO and Hydro-met Equipment Industry (HMEI) as well as the **World Bank** are collaborating in promoting Public, Private and Academic (PPA) collaboration. It is important that world's National Meteorological-Hydrological Societies (NMSocs) also be a part of WMO collaboration and add another dimension to it – a Volunteer-based Workforce – that can assist it in Capacity Building around the world - that is what IFMS is! It provides a feeling of “Family” to its member NMSocs and creates S&T and administrative Collaboration between them and through this cooperation strengthen developing societies to be stronger partners. Another dimension is promoting Capacity Building through Education and Training (E&T).

This 3<sup>rd</sup> Session of the IFMS Global Meeting/Conference #7 was organized to discuss the Value Proposition which IFMS has defined for itself after consulting existing National Meteorological Societies and conducting some surveys. In this Session we presented the current Value Proposition of IFMS and discussed it with the assistance of a Panel and a Q&A session to fine tune it so that we can provide maximum benefits to NMSocs, RMSs and their members. The verdict appeared to be to continue in the direction we have been following up to now.

#### Introducing the Panel

The panel for the Session 3 related to the discussion of the IFMS Value Proposition consisted of some outstanding professionals from various organization with which we plan to work.

Here is a short introduction with more detailed information about each one in the next section.

- ✓ **Jack Hayes - AMS** – Retd. Director of NWS-USA and Past Director Weather Watch Program of WMO.
- ✓ **Walter Dabberdt – AMS** - Past President of AMS and Initiator of IFMS
- ✓ **Vladimir Tsirkunov – WBG** - Lead Specialist and Team Leader of Hydromet Program GFDRR
- ✓ **Michel Jean – Meteorological Services Canada** - Chair, WMO Infrastructure Commission
- ✓ **Tatsuya Kimura – WMO Secretariat** - Director, Public, Private, Academic Engagement
- ✓ **Buruhani Nyenzi – TMS** - VP-Administration IFMS and President of Tanzanian Met Society.

These senior professionals have strong knowledge of the National Meteorological and Hydrological Services, National Meteorological Societies, World Meteorological Organization (WMO), World Bank Group (WBG) and continent of Africa which is in a dire need of capacity building in which IFMS is engaged in assisting.

The Session started with an opening presentation about the Value Proposition of IFMS by Dr. Harinder Ahluwalia – President of IFMS. This presentation was followed by the introduction and opening remarks of the Moderator Dr. Jack Hayes and the 5 Panelists.





## Presentation on “Value Proposition of IFMS”

### Presenter

**Dr. Harinder P. S. Ahluwalia** is the President of the International Forum of Meteorological Societies (IFMS) which aims at creating collaboration between the National Meteorological Societies of the world to leverage each other's strengths. Previously he was the President of the Canadian Meteorological and Oceanographic Society (CMOS). He is also the President and CEO of Info-Electronics Systems Inc. (IES) based in Montreal with an office in New Delhi. Incorporated in 1981, IES is a systems engineering, development and implementation company in Hydrometeorology, Remote Sensing and environment monitoring. Dr. Ahluwalia has been a member of the National Round Table on Environment and Economy advising the Government of Canada on Sustainable Development issues. He is a strong proponent of PPP (Public-Private-Partnership) model for weather business as well as cooperation between nations to achieve optimum results in this border-less issue - weather. He has won many awards for his outstanding contribution to Canada and hi-tech industry. He is a member of many societies and is a Fellow of CMOS. He has published a number of papers/articles in Meteorology and Electromagnetics.



### Abstract:

Dr. Ahluwalia's presentation outlined the advantages of a National Meteorological Society, and a suggested formal process for establishing it. Frequently such societies grow out of a recognised need for a forum that allows members of different occupationally based institutions such as National Meteorological and Hydrological Services (NMHSs), academia and private sector organisations to exchange ideas and cooperate on a wide range of research and operational activities. Additionally, the occupational institutions can draw many advantages from the activities of such societies e.g., through the promotion of meteorology and its related professions, and the capacity for societies to tap into the broader community affected frequently and in multitude ways by the vicissitudes of weather and climate.

To support the development of nascent National Meteorological Societies, the International Forum of Meteorological Societies can provide a wealth of knowledge and experience by drawing from its member societies. In addition, in order to take advantage of the services provided by Regional (EMS, FLISMET and AfMS) and International Societies like IFMS, you must have an NMSoc in your country. Given the activities of the Regional and International Meteorological Societies which they are prepared to share as well as those of other NMSocs, even the smallest country can have an NMSoc. It is also facilitated by the existence of the modern means of conducting Meetings, Webinars Conferences and Training Courses.

### Moderator

The Webinar was **Moderated by Dr. John L. (Jack) Hayes** who is the retired Director of the National Weather Service (NWS) from 2007 to 2012. He also served as permanent representative of the United



States with WMO. Dr. Hayes also served as Director of the World Weather Watch Department for the WMO in Geneva, Switzerland from 2006-2007. He has received several awards, including Presidential Rank Award and recognition, in 2003, as one of the Top 100 IT Executives in the Federal Government. Dr. Hayes holds a Ph.D. and a Master of Science degree in meteorology from the Naval Postgraduate School in Monterey, California. He also worked as the Vice President & Senior Executive Account Manager for Environmental Solutions, Harris Space and Intelligence

Systems Business Segment. After retiring from the Harris Corporation. Currently, he serves as a part-time consultant for Barron Weather Services, assisting the company in understanding NMHS operations, needs and priorities.





## Panelists

1. **Dr. Walter F. Dabberdt** received the M.S. and Ph.D. degrees from the University of Wisconsin. He was a senior research meteorologist at Stanford Research Institute; at NCAR he was scientist, facility manager, and NCAR Associate Director. At the Vaisala Group, he was Chief Scientific Officer. He served on numerous national and international panels and committees, as: a member of the National Academy of Sciences' Board on Atmospheric Sciences and Climate; Board Chair of the Environmental Prediction in Canadian Cities (EPiCC) program; Chair of the Industrial Advisory Board of the multi-university Collaborative and Adaptive Sensing of the Atmosphere Engineering Research Center; Dr. Dabberdt received the Luke Howard Award from the International Association for Urban Climate, and in 2017 he was awarded the AMS' Helmut Landsberg Award for Urban Meteorology. In 2016 he became Knight First Class, Order of the Lion of Finland. Dr. Dabberdt has published 200 papers including 71 peer-reviewed publications.



### Opening Remarks by Dr. Walter Dabberdt

I have long believed the advancement and exchange of scientific, technological and social knowledge presents great opportunities to improve weather forecasting, sustainability and climate guidance provided to society and, in turn, reduce the risks to lives and property worldwide. While president of the American Meteorological Society in 2009, I worked with the leaders of meteorological societies in a number of countries to create an international organization, the IFMS, focused on promoting the exchange of science and technology to advance the depth and breadth of research and its translation into operations that benefit society. Over more than a decade, IFMS has provided an effective venue for atmospheric scientists worldwide to engage in intellectual exchange. In his remarks, he provided some thoughts on the IFMS value proposition.

2. **Mr. Vladimir Tsirkunov** is a Lead specialist and the team leader of Hydromet Program of the Global Facility for Disaster Reduction and Recovery (GFDRR) of the World Bank. Since 2003, he is involved in development and implementation of investment and technical assistance projects supporting improvement of weather, climate and hydrological services and modernization of National meteorological and hydrological services. Mr. Tsirkunov has over 40 years of scientific, applied technical and project management experience in environmental and natural resource management. Prior to joining the World Bank in 1994, he was the Head of the Laboratory of the Supervision of the USSR System of Hydrochemical Monitoring and Water Quality Data Collection



### Opening Remarks by Mr. Vladimir Tsirkunov

The World Bank has a Global Facility for Disaster Risk Reduction and Recovery (GFDRR) which established a Global Hydromet program to support efforts of countries to provide better hydrometeorological, climate, and early-warning services. His brief opening remarks provided an overview of some of the challenges faced in developing and least developed countries in minimizing the impacts of weather and climate to life, property and the economies of countries. We believe that better engagement and partnerships among the three sectors of the weather enterprise can help address key challenges and improve provision of weather services for people. To support this, our team is coordinating a work of the Global Weather Enterprise Forum (GWEF) which in coordination with WMO's OCP is bringing together representatives of public, private and academic institutions. Organizations like IFMS which create partnerships among National and Regional Meteorological

Societies can maximize the impacts of science and technology to improve weather and climate services and reduce the impact of severe weather and climate conditions.

3. **Mr. Michel Jean** is an Emeritus Associate of Environment and Climate Change Canada (ECCC) and was previously the Director General of MSC-ECCC's Operations. He was a member of the WMO Commission for Basic Systems (CBS) since 2006 and in November 2016 he was elected its President. Since June 2019, he is the elected President of WMO's newly established Infrastructure Commission.



He graduated from the Université du Québec à Montréal (UQAM) in Physics in 1982 and obtained his Master's degree in Meteorology from McGill University in 1987. He has been an operational meteorologist and has managed regional and national atmospheric and climate science programs, field operations in the area of weather prediction and atmospheric and hydrometric monitoring and the development of national weather and environmental prediction systems.

In 2014, he was tasked to create the Canadian Centre for Meteorological and Environmental Prediction, whose objective is to provide Canada with the best human, science and technology infrastructure to analyze and predict atmospheric, ocean and ice conditions for decision making. He was responsible for the long-term High-Performance Computing strategy and the development and implementation of the next generation integrated forecaster workstation.

Mr. Jean has been involved in government wide security and counter-terrorism work and he was a member of the Canadian National Authority for the Comprehensive Nuclear-Test-Ban Treaty (CTBT). He has also been involved with the ICAO International Airways Volcanoes Working Group and with the WMO Emergency Response Activity group.

Mr. Jean is the recipient of many prizes and recognitions within the Public Service of Canada. His awards include: in 2002 recipient of the Andrew Thompson prize in applied meteorology from the Canadian Meteorological and Oceanographic Society, recipient of the Patterson Distinguished Service Medal for distinguished service to meteorology in Canada; in 2019 he received Jim Bruce Award for outstanding contribution to the Environment and Climate Change Canada's meteorological programs. He has been granted an Emeritus Associate status with ECCC.

### **Opening Remarks by Mr. Michel Jean President, WMO Infrastructure Commission**

We live in a time of brilliant technologies and the rhythm of innovation is increasing at an unprecedented pace. We are flooded by earth observations; social media provides access to contextual information and unprecedented dissemination mechanisms and high-performance computing platform allow us to tackle previously unsolvable problems such as analyzing and predicting all the components of the Earth System. Not only is this forcing us to rethink our business models, our recruitment, training, partnership and capacity development strategies, it also forces us to reflect on how our professional societies can play a role in this. We should also reflect on the interactions and synergies between professional societies in a context where Earth System's approach is the conduit to mitigate and resolve the environmental problems of the next century.

4. **Mr. Tatsuya Kimura**, is the Director Public-Private Engagement (PPE) Office, WMO Secretariat. He joined the WMO Secretariat as Public-Private Engagement Seconded Expert in February 2020. This year he became the Director of PPE. He earned an MS degree of Physics from Tohoku University in 1989 before starting at the Japanese Meteorological Agency (JMA). Mr Kimura worked extensively within JMA HQs in strategic planning, satellite program, and international cooperation. He served in JMA Director roles at the Aeronautical Meteorology Division, the Public Awareness and Partnerships Division and the Observation Department's Administration Division. His recent focus has been on the promotion of Public-Private Engagement in Japan through leading the Secretariat of the Weather Business Consortium (WXBC).



#### **Opening Remarks by Mr. Tatsuya Kimura**

The Open Consultative Platform (**OCP**) – Partnership and Innovation for the Next Generation of Weather and Climate Intelligence – serves as a relevant mechanism for engagement in the WMO processes for all those who wish to contribute from the public, private, academic sectors, and civil society. More PPE good practice sharing is awaited from all stakeholders to leverage opportunities expected from public-private engagement for further better services. Also, regional/national dialogues are expected to be launched and sustained to build more trust and share common goals among all stakeholders. The academic sector has provided scientific findings and technological advancements that underpin all infrastructures and services of meteorological service. The sector has also been a good source of human resources and a good partner in education and training activities. In today's fast-moving world, each sector is expected to play a complementary and evolving role.

He reviewed what is expected of the academic sector, after he updated us on progress on WMO's PPE-related activities, including the Open Consultative Platform (**OCP**)-centered activities (such as White Paper #1 and the High-level forum).

5. **Dr. Buruhani Nyenzi** is the Vice-President-Administration of IFMS. He is also the President of the Tanzanian Meteorological Society. The late President of the United Republic of Tanzania H. E. Dr. John Pombe Magufuli reappointed Dr. Buruhani Nyenzi to Chair the board of directors of the Tanzania Meteorological Authority (**TMA**) for four years with effect from 18 November 2019. Recently he has been elected to lead the process of establishing the African Meteorological Society. He is a retired Senior International Civil Servant Meteorologist from the World Meteorological Organization, a specialized UN Agency where he worked for about ten years from 2000 to 2010. During that assignment he served the World Meteorological Organization (**WMO**) in different capacities which included Chief of the Climate Applications and Prediction Services (**CLIPS**) project; Director, World Climate Programme (**WCP**); Director of the Climate Prediction and Adaptation Branch; Director and Secretary of the World Climate Conference -3 Secretariat and Special Advisor to the Director, WMO Climate and Water Department; and Manager (Consultant) to the High-Level Taskforce on the Global Framework of Climate Services (**GFCS**). He has also served other international organizations such as the IPCC, UNFCCC, World Bank, SADC, UNECA, and African Development Bank in relevant various research activities.



#### **Opening Remarks by Dr. Buruhani Nyenzi**

The main objective of IFMS is to strengthen International Cooperation in Science and Technology (**S&T**) and to help National Meteorological Societies, especially those from developing and least developed countries (**LDCs**), to become stronger so that they can help build capacity in their countries. He concentrated on the requirements of the continent of Africa which consists of 54 countries out of which 33 fall in the category of LDCs.

IFMS has already been assisting Africa in many different ways e.g., Africans have been participating in IFMS Webinars and Meetings to learn about its Education and Training (**E&T**) Program, about Public Private Partnership Initiative of WMO and WBG, how to create an NMSoc, etc.

For capacity building in Africa, we were looking for recreating the African Meteorological Society (**AfMS**) which once existed but could not be sustained for many different reasons. IFMS has strongly assisted us in recreating AfMS and we are confident to be able to sustain it this time with the assistance of IFMS and, through IFMS, assistance from other strong National and Regional Meteorological Societies.

AfMS has a constitution, a list of objectives and activities to fulfill them which is expected to strongly help us in build capacity in African countries. That we consider a real value being provided by IFMS.

AfMS is looking forward to getting registered soon and have a Virtual Inauguration Ceremony in which we will invite all important players including financing agencies (e.g., African Development Bank, World Bank, etc.) in the Global Weather Enterprise so that in future we could seek their assistance.

As has been stated in the Opening Presentation by IFMS President, only NMSocs can be members of RMSocs (e.g., AfMS, EMS, etc.) and IFMS. Under current conditions of collaboration created by IFMS and RMSocs like EMS, FLISMET, etc. and available means of virtually conducting meetings, webinars and conferences, he also illustrated that every country no matter how big or small can have an NMSoc. We in Africa look forward to working with IFMS in creating an NMSoc in each country which currently does not have one.

Out of 54 countries of Africa, we currently have only 10 known NMSocs (Mauritius, Ethiopia, South Africa, Kenya, Nigeria, Sudan, Uganda, Tanzania, Algeria and Egypt). We have a long way to go to fulfill the goal of having an NMSoc in all countries but we are confident that we will succeed in this noble mission!

IFMS has already presented two Webinars on the Utility of NMSocs and how to create them. The process of creating NMSocs has already been started by Sierra Leone, Zimbabwe, Zambia and Cameroon and they are being assisted by IFMS in this process. We will also be encouraging other countries to do the same.

As soon as AfMS is registered we will start our activities and through IFMS we would seek assistance from strong societies like EMS, AMS, RMetS, CMS, IMS, etc. some of which have already started helping e.g., AMS is paying for AfMS Website for which we are sincerely thankful to AMS.

We look forward to strong collaboration with IFMS and through IFMS with other strong Societies in the world to build capacity in Africa. That we call real Value Proposition.



Organizations involved in creating a "Weather Ready Globe"				
Weather & Water Related Organizations				
<b>Beneficiary</b>	National Meteorological Services	National Meteorological Societies	HydroMet Equipment Industry	World's Least Developed & Developing
<b>Financed by</b>	UN	<b>Donations</b> (Volunteer-Based)	Industry	World's Richest Nations

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6. **Sharing Best Practices, guiding Certification/ Accreditation Processes.**
7. **And much more – Visit: [www.ifms.org](http://www.ifms.org)**

## IFMS Global Meeting #7 Session 4 Global Warming & Climate Change (GW&CC) Causes, Remedies & Protection

On December 8, 2021 at 8:00 AM New York – 13:00 UTC

### PRESENTER



**Dr. Harinder Ahluwalia**  
President - IFMS

### MODERATOR



**Dr. Mike Farrar**  
President- AMS

### PANELISTS



**Dr. Mrutyunjay Mohapatra**  
Director General  
India Met. Department



**Prof. Tsegaye Tadesse**  
Prof. Univ. of Nebraska  
NDMC – Geospatial  
Data Coordinator



**Dr. Ladislaus Chang'a**  
Director – R&D (TMA)



**Mr. Zablon W. Shilenje**  
Technical Officer  
WMO-RO-01



**Mr. K.Y. Camyale Chao**  
Executive Director  
ICDI





## **IFMS GLOBAL MEETING/CONFERENCE #7 - 2021**

### **SESSION 4: December 8, 2021**

## **GLOBAL WARMING & CLIMATE CHANGE (GW&CC)**

**IFMS has been created to unite all National Meteorological Societies of the world to achieve more than they could individually. It also assists in building Institutional and Societal Capacity**

### **Introduction**

Global Warming and Climate Change (GW&CC) are creating a lot of news around the world. It is a topic which not only interests the professionals in the field of meteorology but also general public, bureaucrats and politicians. Therefore, IFMS decided to include a full session on the issue of GW&CC in its IGM/C-07 which was held in November and December 2021 over a period of 5 Wednesdays and one Thursday.

This Session consisted of 2 parts as follows.

**Part 1:** Public Lecture on Causes of Global Warming & Climate Change (GW&CC), its Remedies and how to cope with the effects of GW&CC. (45 minutes).

**Part 2:** Panel Discussion on topics discussed in Part 1 – 75 minutes.

We had a very strong panel to discuss the GW&CC and respond to the questions posed by participants in this Session.

### **Public Lecture on Global Warming and Climate Change**

**Dr. Harinder P. S. Ahluwalia** is the President of the International Forum of Meteorological Societies (IFMS) which aims at creating collaboration between the National Meteorological Societies of the world to leverage each other's strengths. IFMS endeavors to create capacity around the world to handle adverse effects of Global Warming and Climate Change in all countries. Previously he was the President of the Canadian Meteorological and Oceanographic Society (CMOS). He is also the President and CEO of Info-Electronics Systems Inc. (IES) based in Montreal with an office in New Delhi. Incorporated in 1981, IES is a systems engineering, development and implementation company in Hydrometeorology, Remote Sensing and environment monitoring. Dr. Ahluwalia has been a member of the National Round Table on Environment and Economy advising the Government of Canada on Sustainable Development issues. He is a strong proponent of PPP model for weather business as well as cooperation between nations to achieve optimum results in this border-less issue - weather. He has won many awards for his outstanding contribution to Canada and hi-tech industry. He is a member of many societies and is a Fellow of CMOS. He has published a number of papers/articles in Meteorology and Electromagnetics.



### **Abstract:**

There are two parts to the issue of Global Warming and Climate Change (GW&CC). The first part is to understand what is causing it and how we can reduce it. The second part is: knowing that it is happening and is intensifying over time, how we can protect our life and property from the natural disasters caused by GW&CC.

In the first part he discussed:

- a) What is GW&CC and what is causing it,
- b) How we can reduce, if not eliminate, it,
- c) What are the impacts of GW&CC on our health/life and property,
- d) Where we can learn much more about it,

The Second part dealt with knowing that GW&CC is happening, he outlined how we can protect ourselves from its adverse effects. We discussed the following topics:

- a) What is required to protect ourselves e.g., accurate impact-based weather forecasting, Multi-Hazard Early Warning Systems, building Institutional and Societal Capacity, etc.
- b) We also discussed what is IFMS doing in Capacity Building in the above areas.

More ideas were exchanged in the subsequent Panel discussion in which the experts provided their views and through Q&A clarify doubts of participants.

### Moderator

**Dr. Mike Farrar** is the director of the National Centers for Environmental Prediction (NCEP). NCEP delivers national and global weather, water, climate and space weather guidance, forecasts, warnings and analyses to help save lives and protect property. As its Director, Mike oversees the planning, science and technology, and operational responsibilities related to NCEP's nine national centers.



In his previous roles, Mike served as the Chief Scientist for weather operations for the U.S. Air Force (USAF), senior VP and chief operating officer of the University Corporation of Atmospheric Research (UCAR), director of the Environmental Modeling (EMC) and the Meteorological Development Laboratory (MDL) in NWS, and VP of strategic and business development for Science and Technology Corporation. He began his career as a uniformed USAF meteorologist where he served for 24 years in several leadership positions in forecast operations, scientific development, program management, training, budgeting, planning/policy, and collaboration with U.S. and international partners.

Mike holds a B.S. in physics from Purdue University, a B.S. in meteorology from The Pennsylvania State University, an M.A. in national resource strategy from the Eisenhower School of the National Defense University, and M.S. and Ph.D. degrees in meteorology from Florida State University.

### Opening Remarks of Dr. Mike Farrar were:

Session #4 on Global Warming and Climate Changes provided a brief summary of climate change with a focus on the evolution of the science and policy options over the last few decades and where we find ourselves in 2021. Now that the vast majority of the world's nations acknowledge the role of humans in climate change and note that it is already happening, the panel covered the logical responses to climate change, which fall in 3 basic areas: (1) *Mitigation* -- actions we can take to reduce the flow of greenhouse gases into the atmosphere, and thereby lessen the severity of global warming in the long term; (2) *Adaptation* -- actions we can take to adapt, or better live with, the current and future state of the planet that has higher temperatures and sea level; and (3) *Intervention* -- actions we may consider taking to directly change the Earth's energy balance to reduce the impact of greenhouse-caused global warming. After that introduction, each panelist provided his perspective on how his current and past professional roles relate to climate change and its impacts, how climate change has impacted their country or region and what their biggest concerns are for the future, and finally what gives them hope for improving the situation for their region and the world at large.

## Panelists

### **1. Dr. Mrutyunjay Mohapatra** is the Director General of India Meteorology Department (IMD).

Dr. Mohapatra joined IMD in 1992 and was working in Odisha when the Super Cyclone of 1999 struck the coast killing more than 15,000 people.



Dr. Mohapatra is affectionately known as ‘cyclone man of India’ for having accurately predicted the path of ferocious cyclonic storms many times.

Dr. Mohapatra, the scientist, has received many national and international awards including the Young Scientist Award of Ministry of Earth Sciences and Achievers Award from the IMD for his research and service in the field of atmospheric sciences.

IMD is responsible for weather and climate-related forecasts for the country. It is also mandated to warn against severe weather phenomenon like cyclones, dust storms, heavy rain and snow, cold and heat waves, among others.

### **Opening Remarks of Dr. Mrutyunjay Mohapatra**

Dr. Mohapatra stressed the need for augmented early warning systems in view of the effects of Climate Change. As has been pointed out the Climate Change has been felt throughout the globe including in the poor and rich countries, including developed and under developed nations and including sea and land as well as upper atmosphere – Climate Change sees no barriers. The vagaries arising out of the Climate Change are increased frequency and intensity of weather events - especially convective events such as rain falls, flooding, cyclones, droughts etc. They affect the economic conditions and safety of the entire society.

There has been increase in average temperature, higher rate of evaporation i.e., higher in intake of moisture into the atmosphere, hence there has been changing distribution in the occurrence of rainfall. While the total amount of rainfall during the monsoon in India remained the same, the number of days with heavy rainfall and intensity have changed in some cases drastically. This appears to be the case with other parts of the world too - the occurrence of extreme events has increased. This has increased the frequency of riverine flooding and intensity of floods and in hilly areas resulting in landslides, mud slides, etc. In addition, if we look at the Intensity of eastern cyclones in oceans - Indian, Atlantic, Pacific, it has increased. While Ocean has been a great sink for the CO<sub>2</sub>, Global Warming has caused reduction in that absorption.

Need of the hour now is to look into further how to augment and improve Early Warning Systems, not only for existing conventional extreme weather but also its impact. Therefore, the need is to go for enhanced impact-based forecasting corresponding to all types of parameters for - thunderstorms, heatwaves, cyclones, etc. If we really want to go for early warning the predictability needs to be improved. This is only possible if we augment the observation network so that we can have better observations to detect the meso-scale parameters of the event.

For this purpose, there is a need for investment especially for infrastructure for observations, there is a need for collaboration, specially to help the poor countries, developing countries, Island Nations.

Measurement networks need to be denser; it is important to improve the communication of weather and enhance numerical modeling. Numerical Modeling has improved significantly over the globe. It is important for developed and developing countries to work together and implement Early Warning Systems based on impact-based forecasting. There is a need to effectively handle Big Data and employ, Machine learning, Artificial Intelligence.

2. **Prof. Tsegaye Tadesse** is a research professor of applied climate and remote sensing in the School of Natural Resources (SNR), University of Nebraska-Lincoln. He is also a Geospatial coordinator of the



National Drought Mitigation Center (NDMC). Professor Tadesse's experience and primary research interests are centered on modeling climate, remote sensing, and environmental data using geospatial and data mining techniques to monitor and predict hydro-climatic extremes (e.g., drought and flood) in support of risk management in agricultural, natural resources, and food security applications. These interests stem from the fact that integration of climate, satellite, and biophysical data such as land use/land cover better characterizes climate-vegetation and human-environment interactions, as well as natural processes such as hydrologic cycles. The opportunity to work at the NDMC and participate in various research projects in the Geospatial technology (GIScience) program area of the NDMC has allowed Professor Tadesse to develop an active and diverse climate and water resources research and outreach programs, particularly in the areas of drought monitoring, climate variability and change, food security, and vegetation phenology. Professor Tadesse has established strong research collaborations with several federal agencies (e.g., NASA, NOAA, USDA, and USGS) and international institutions such as the Food and Agriculture Organization (FAO) and regional centers such as the IGAD Climate Prediction and Applications Centre (ICPAC).

### **Opening Remarks of Prof. Tsegaye Tadesse**

The recurrent droughts in Africa, exacerbated by climate change, created a need for more effective drought planning and the development and implementation of appropriate mitigation strategies. The integration of a drought risk management approach into the national policies would allow long-term development intervention measures to be adapted to the changing climate. New measures that allow anticipating and coping with drought by focusing on long-term drought resilience in addition to short-term response are needed to keep up with the evolving climate conditions. Strategically, Africa needs to ensure food security for an ever-increasing population while reducing its drought vulnerability and protecting the environment. African countries should also strengthen their efforts to tackle the crosscutting and multidisciplinary global challenges that include climate change, energy, food, agriculture and nutrition, global health and water.

3. **Dr. Ladislaus Chang'a** is a Principal Meteorologist and the Director of Research and Applied Meteorology at Tanzania Meteorological Authority. He has been working in the area of climate and



Meteorology since 1995. He has contributed in establishing TMA Research Journal and TMA Statement on the status of Tanzania climate, a publication that is issued on annual basis.

He is the IPCC Focal Point for Tanzania and a Secretary of Tanzania Meteorological Society.

Dr. Chang'a also serve as Part-time Lecturer at the University of Dar Es Salaam, teaching Climatology, Climate Monitoring and Prediction for BSc students, and the Science of Climate Change for MSc students. He is actively involved in supervision and mentoring of MSc and PhD students.

Dr. Chang'a actively participate in the Conference of Parties of the United Nation Framework Convention on Climate Change (UNFCCC) and in the implementation of the IPCC activities in Tanzania.

### Opening Remarks of Dr. Ladislaus Chang'a

Evidences and Impacts of Climate Change in Tanzania are increasingly manifested through documented increase in frequency and intensity of extreme events including strong wind, heavy rainfall, hailstorm, higher temperatures, droughts and floods, and devastating socio-economic and ecological impacts including loss of life and properties caused by these extremes. Between 1981 and 2020 several incidences of droughts, floods and record-breaking rainfall have been observed in many parts of the country. Most of these extreme weather events including record breaking rainfall have been observed in the past five years (2015, 2016, 2017, 2018 and 2019), which is consistent with global warming patterns and trends as documented in very recent publications (Chang'a et.al., 2019, 2020). The nights are getting warmer than the days across much of Tanzania and this is consistent with the observed global warming patterns (IPCC, 2018, 2019, 2020, 2021). In Tanzania, each of the last four decades have been successively warmer than any preceding decades since 1961, while at a global scale each of the last four decades have been successively warmer than any preceding decades since 1850 (WGI report, 2021). The averaged global warming level was around 1.2<sup>0</sup> C in 2020 above pre-industrial era. In Tanzania warming levels was 0.8<sup>0</sup>C in 2019 and has been 0.6<sup>0</sup>C in 2020. Unfortunately, warming is increasing year after year consistent with the increasing GHG emission.

The IPCC Special Report on Global warming on 1.5<sup>0</sup> C indicates that if we continue with business-as-usual scenario, a global warming of 1.5<sup>0</sup> C will be reached by 2030. Under this warming level, Coral Reefs are projected to decline by 70 to 90%. Urgent, Significant and Effective Adaptation ACTIONS and SUPPORTS, particularly for developing countries are required, and ambitious mitigations actions are also required to serve humanity and the Planet.

#### 4. Mr. Zablon Shilenje is a Technical Coordinator at WMO Regional Office for Africa. Before



joining WMO he served as a Research Fellow at Charles University on climate change. Previously he served Kenya Meteorological Department as a weather forecaster and a Research Scientist. He has also served as a director of environment and climate change with a devolved government in Kenya. His professional interests are in weather forecasting, climate change modelling, adaptation, mitigation, and environmental conservation.

### Opening Remarks of Mr. Zablon Shilenje

African Union (AU) Climate Change Strategy recognizes that Africa is experiencing unprecedented times as evidence of warming over land regions and frequency and intensity of extreme events are increasing. The recent IPCC Special Report on Global Warming of 1.5<sup>0</sup> C indicates that climate impacts would hit hard Africa and Small Islands Developing States (SIDS) compared to the Developed World. The report further specifies that global warming of 1.5<sup>0</sup> C could result into reduction in crop yield, increased multiple risks, and could trigger greater proportion of people susceptible to poverty.

Over the past decade, frequencies and severity of natural disasters have increased across Africa and have caused major economic, environmental, and social losses with huge impacts on vulnerable and marginalized groups. Africa is also experiencing slow onset disasters with long-term impacts to economies and to the People. The projected impacts will significantly affect the Continent's productive sectors, particularly water resources, agriculture, land, energy, health, trade, tourism and the natural resource base, causing major economic, ecological and social impacts that can significantly undermine efforts to achieve the aspirations of AU Agenda 2063.



The Pan African Vision framed in the African Union (AU) Agenda 2063 is that of: ‘An integrated, prosperous and peaceful Africa, driven by its citizens and representing a dynamic force in the global arena.’ Attainment of this Vision is threatened by the impacts of climate change unless decisive efforts are made globally to adapt to and mitigate its effects. Although climate change has been the subject of much political controversy, the scientific evidence is overwhelming that ‘warming of the climate system is unequivocal’ (International Panel on Climate Change, 2013).

**5. Mr. Kung-Yueh Camyale Chao**, is the Executive Director of International Climate Development Institute (ICDI), Taiwan



Kung-Yueh Camyale Chao has been working in the public affairs fields for 20 years, and he is currently the Executive Director of International Climate Development Institute (ICDI). In addition, Camyale also served as the General Secretary of the International Forum of Meteorological Societies (IFMS) from January 2016 to September 2018, and has been elected as the Treasurer of IFMS since Sep 2019. Camyale was involved in many international activities e.g., Future Collaboration in Future Earth, CSO Representative in EBRD etc. Prior to this position, Camyale served as the Deputy Director of APEC Research Center for Typhoon and Society (ACTS) for 4 years.

Camyale studied Ph.D. in Politics at the University of York in the UK, and also studied Ph.D. in Educational Policy and Management at the National Taipei University of Education. He was Lecturer in various Universities including Tamkang University, Taipei City University of Science and Technology, and teaching “Smart City Governance” course at Soochow University. Camyale is also a certified trainer of UNDRR.

#### **Opening Remarks of Mr. Kung Camyale Chao**

Camyale Chao shared his experiences for his participation in UNFCCC / COP meetings since 2009, and suggested to promote climate services with various partners. In addition, capacity building from community level, and mainstreaming the climate change in the society will be essential.

Organizations involved in creating a "Weather Ready Globe"				
Weather & Water Related Organizations				
<b>Beneficiary</b>	National Meteorological Services	National Meteorological Societies	HydroMet Equipment Industry	World's Least Developed & Developing
<b>Financed by</b>	UN	Donations (Volunteer-Based)	Industry	World's Richest Nations

## IFMS VALUE PROPOSITION

1. **IFMS Uniting and coordinating the activities of National Meteorological Societies (NMSocs) & Associated Societies.**
2. **Conducting Webinars & Conferences**
3. **Creating S&T Collaboration between NMSocs**
4. **Creating capacity through Webinars, Education & Training**
5. **Assisting in creating new Societies**
6. **Helping NMSocs in understanding new concepts such Global Weather Enterprise, WMO-OCF Global Campus & WB-GWEF, etc.**
7. **Sharing Best Practices, guiding Certification/ Accreditation Processes.**
8. **And much more – Visit: [www.ifms.org](http://www.ifms.org)**

# IFMS Global Meeting #7 Session 5 Multi-Hazard Early Warning System (MH-EWS) On December 15, 2021 at 8:00 AM New York – 13:00 UTC

## PRESENTERS & PANELISTS



Prof. (Dr.) Daniel Sempere-Torres  
Professor of Hydrometeorology  
[Universitat Politècnica de Catalunya \(UPC\)](http://www.upc.edu),



Dr. Xavier Lloret  
Head of R&D at [HYDS](http://www.hyds.org)

## MODERATORS



Dr. Harinder Ahluwalia  
President - IFMS



Prof. Oscar Frumento  
National University of  
Patagonia \_Argentina



Mr. Ramesh Bhatia  
Past President IMS  
Retd. ADG- IMD – India

## PANELISTS



Dr. Agnes Kijazi  
Director General TMA  
3<sup>rd</sup> VP-WMO



Mr. Jim Abraham  
President CMOS  
Retd. DG Monitoring - MSC

# **IFMS GLOBAL MEETING/CONFERENCE #7 - 2021**

## **SESSION 5: December 15, 2021**

### **MULTI-HAZARD EARLY WARNING SYSTEM**

### **SAVING SOCIETY AT LARGE FROM EFFECTS OF GW&CC**

### **Building Institutional and Societal Capacity**

#### **Introduction**

The effects of Global Warming and Climate Change (**GW&CC**) are causing more and more severe weather events causing a lot of damage both to life and property creating a lot of news around the world. It is a topic which not only interests the professionals in the field of meteorology but also general public, bureaucrats and politicians. Therefore, IFMS decided to include 2 full sessions on the issue of GW&CC in its IGM/C-07 being held in November and December 2021.

**Session 4:** Public Lecture on Causes of Global Warming & Climate Change (**GW&CC**), its Remedies and how to cope with the effects of GW&CC. (40 to 45 minutes), followed by a Panel discussion with expert Moderator and Panelists.

**Session 5:** This Session is on Early Warning Systems. Two speakers from Spain who have in depth experience in developing such systems made presentations. The first presentation was on A4EU – the Multi-Hazard Early Warning System (**MH-EWS**) – Anywhere for Europe. The second presentation was on MH-EWS implemented in Spain. This was followed by a very strong panel to discuss all the issues related to MH-EWSs and how they can be developed in developing and least developed countries.

#### **Presentation on the Anywhere Multi-Hazard Impact-Based Early Warning System: A Change of Paradigm of Climate Risk Management.**

**Prof. (Dr.) Daniel Sempere-Torres** is a Professor of Hydrometeorology at the Civil and Environmental Engineering Department of the [Universitat Politècnica de Catalunya \(UPC\)](#), and Director of the [Center of Applied Research in Hydrometeorology \(CRAHI\)](#). He has more than 25 years of experience on hydrometeorological modelling, hydrological applications of weather radars, flood Early Warning Systems, Decision Support Systems and climate emergencies risk management. He has been EU coordinator of the H2020 Innovation Action [ANYWHERE](#), of the FP7 project [IMPRINTS](#), and of the UCPM projects [ERICHA](#), EDHIT and HAREN. He is a member of the advisory board of the Meteorological Service of the Catalonia region (Spain).



#### **Presentation Abstract**

**Prof. Daniel Sempere-Torres** ([SEMPERE@CRAHI.UPC.EDU](mailto:SEMPERE@CRAHI.UPC.EDU)) and **Marc Berenguer** - Centre de Recerca Aplicada en Hidrometeorologia. Universitat Politècnica de Catalunya (CRAHI-UPC). Barcelona. Spain.

It is widely accepted that during the last decades sustained increase of the frequency and intensity of the climate-induced emergencies such as floods, storms, wildfires, heatwaves and droughts is related to global warming. The extreme events registered worldwide during 2021 exemplify how the combined effect of the increase in the frequency of climate-induced emergencies and the resulting increase of human exposure make entire communities unprecedentedly exposed to events to which they are not prepared to react. Moreover, these climate-induced emergencies should not be seen as an anomaly, but

as precursors of the “new normality” we will experience in the next decades. It is believed that the present disaster risk management strategies are not well adapted to new realities.

Therefore, it is time to lead a **change of paradigm in climate-induced risk management**, consistent with the new urgency imposed by the climate change adaptation. In other words, we need to adopt new technologies we have at hand (but still not commonly used) to the new societal needs.

In this context, the **ANYWHERE EU H2020 innovation action** ([www.anywhere-h2020.eu](http://www.anywhere-h2020.eu)) proposes an operational **Multi Hazard Early Warning System (MH-EWS)** for climate emergencies able to translate the most advanced meteorological forecasts into **Impact forecasting products** (see <http://anywhere-h2020.eu/our-vision/catalogue-products>) to allow pro-active management of climate emergencies by **Civil Protection Authorities and Emergency Management Centres (EMCs)**.

**ANYWHERE** uses AI to integrate **forecasts with high resolution local impact models** (like PROPAGATOR in the case of wildfire propagation, the FF-EWS flash-flood impact indicator or the snow affectation impact on roads model for instance) automatically combining them with the **regional layers of exposure and vulnerability** to support **pro-active decision making at EMCs**. All this information, usually available but not interconnected, is now processed in the **multi-risk decision support platform A4EU (ANYWHERE for EU**, see <http://anywhere-h2020.eu/services/multi-hazard-early-warning-platforms/a4eu>), to **automatically identify the affected critical points**. Including their characteristics and location, and other advanced services designed to allow emergency response specialists to **focus on local IMPACTS**, without the necessity to look into the details of the meteorological forecasts and triggers, **selecting the most vulnerable locations** (i.e., Schools, Train stations, Hospitals, Seveso facilities, etc.) instead of vast regions, operationally supporting them to enhance their response capabilities.

These systems have been verified, tested and operationally demonstrated in **7 EMCs covering all the climatic range in EU** (see <http://anywhere-h2020.eu/services/multi-hazard-early-warning-platforms/a4eu/pilot-sites>), showing excellent results in a number of events, some over 50-year return period. The collected experiences have been presented as success stories by the project showing the **huge innovative potential of the ANYWHERE real-time implementations** see:

<https://www.youtube.com/watch?v=ugajZRJzxxQ>).

The presentation introduced the **ANYWHERE project** as well as the main characteristics of the **MH-EWS** and **A4EU** platforms. Preparing the floor for a second presentation about the operational services based on the **ANYWHERE** solutions offered by the SME [HYDS](#).

## **IMPLEMENTATION OF THE ANYWHERE MULTI-HAZARD IMPACT-BASED EARLY WARNING SYSTEM AT MUNICIPAL, REGIONAL AND NATIONAL LEVEL**

**Dr. Xavier Lloret Pavon obtained his** M.Sc. degree in Maths from the Universitat de Barcelona in 2002



and Ph.D. degree in Civil Engineering from the [Universitat Politècnica de Catalunya](#) in 2010. He joined the the [Center of Applied Research in Hydrometeorology \(CRAHI\)](#) in 2002, where he did his dissertation on the error structure of radar rainfall and its errors, working on both ground- and space-borne radars. Until May 2011, he worked as the Development Head of CRAHI-UPC.

Since June 2011, he has been enrolled as **Head of R&D at [HYDS](#)**. He has participated in several EU R&D projects as well as public and private projects.

His interests include precipitation estimation with focus on applied solutions: Early Warning Systems and Decision Support Systems for hydrometeorological risks.



## Presentation Abstract

Dr. Xavier Llort and Rafael Sanchez Diezma - Innovative Solutions (HYDS). Barcelona. Spain.

**ANYWHERE** H2020 innovation action ([www.anywhere-h2020.eu](http://www.anywhere-h2020.eu)) created an operational **Multi Hazard Early Warning System (MH-EWS)** focused on *translating the meteorological forecasts into impact forecasting products*, and a set of tools (**A4EU platform**) tailored for different stakeholders to foster pro-active management of hydrometeorological emergencies.

Those ANYWHERE solutions have been implemented as **operational services** for Civil Protection Authorities and Emergency Management Centres at different levels: municipal, regional and national level.

The presentation introduced the case study of Spain, showing the multilevel implementation:

- **Municipal:** Implementation in 34 municipalities of Alicante region (~600k inhabitants in total) for flood early warning and emergency management. Where Early Warning based on a multi-source of impact products has been linked with municipal auto-protection plans to help municipal civil protection authorities to trigger impact mitigation actions and improve emergency management.
- **Regional:** Implementation in Catalunya area (~8M inhabitants) for multi-risk management: flash-floods and riverine floods, snow, forest fires, heat and cold waves, wind, air pollution, etc. The implementation is focused on providing early warning on different elements (both administrative units and critical elements) to help focus the civil protection authorities in the most potential affected areas to disseminate local warnings and distribute assets accordingly.
- **National:** The ANYWHERE solution is the backbone of the Spanish national alert network (RAN: Red de Alerta Nacional). This implementation connects and collects data and warnings in real time from the different national agencies (National Weather Agency, National Geological Institute, National Water Directorate, National Transit Authority, National Ports Authority, etc.) in order to provide a single access point to all national warnings and associated information for civil protection authorities.

Explanation of the systems as well as a real-time demonstration was done.

## Moderators

**A. Dr. Harinder P. S. Ahluwalia** – Since 2015, he has been the President of the International Forum of Meteorological Societies (**IFMS**) which aims at creating collaboration between the National Meteorological Societies of the world to leverage each other's strengths. Previously he was the President of the Canadian Meteorological and Oceanographic Society (**CMOS**). He is also the President and CEO of Info-Electronics Systems Inc. (**IES**) based in Montreal with an office in New Delhi. Incorporated in 1981, IES is a systems engineering, development and implementation company in Hydrometeorology, Remote Sensing and environment monitoring. Dr. Ahluwalia has been a member of the National



Round Table on Environment and Economy advising the Government of Canada on Sustainable Development issues. He is a strong proponent of PPP model for weather business as well as cooperation between nations to achieve optimum results in this border-less issue - weather. He has won many awards for his outstanding contribution to Canada and hi-tech industry. He is a member of many societies and is a Fellow of CMOS. He has published a number of papers/articles in Meteorology and Electromagnetics.



## Opening Remarks – Dr. Harinder Ahluwalia

There is a big effort to cutdown on the usage of fossil fuels and plant a lot of trees to keep the temperature rise below 1.5° C over the pre-industrial era. It is also important to note that despite taking all these measures, we will still face a lot of weather-related disasters which need to be forecasted accurately to warn the citizens about impending disasters. In other words, all countries will need MH-EWS to safeguard their population. All countries (including least developed ones) will require at least a basic infrastructure for measuring weather parameters and make them available on GTS of WMO. As a part of Education and Training Value Proposition of IFMS, we would like to assist WMO and WB to educate our member societies and their professionals about the implementation of MH-EWS.

In mid to late 1980s, I was involved in the implementation of a project for the distribution of weather information through Satellite for the Meteorological Service of Canada. Knowing how important weather information for aviation is and also knowing that quality weather information for aviation is not available in many developing and least developed countries, I decided to make a proposal to the UKMet Office to promote a centralized system to do aviation forecasting for entire world and distribute it through satellite. Eventually, ICAO decided to develop such a system with WMO assistance. The UK Met Office and the National Weather Service of USA were selected to develop a system for worldwide aviation weather forecasting products and distribute them through satellite. Three satellites were used to cover the entire globe and aviation products produced by UKMet Office and NWS were distributed. As the Internet coverage has improved, this system now distributes aviation weather information through Internet.

One of the topics I would like to discuss is whether implementation of such a system for MH-EWS covering entire world is possible and if yes, what it will take to implement it.

Since **Institutional and Societal capacity building** is a very important part of such a system, how we can achieve that.

**B. Prof. Oscar Frumento** – Professor of Climate System, Faculty of Natural and Health Sciences, National University of Patagonia San Juan Bosco, Puerto Madryn, Argentina.



Principal Professional Officer and Head of the Climatology Laboratory at the Centre for Studies of Maritime Systems (CESIMAR), CCT-CENPAT, National Council of Science in Puerto Madryn, Argentina. Experience in regional climate modelling and dust transport; design of local and regional surface observing networks.

Member of the CESIMAR CD by the professional and technical staff (2016-present)

Climatology advisor for the early warning system for bushfire (in association with INTA, National Institute of Agricultural Technology, Trelew, Argentina).

Contributor to the Argentine Third National Communication to the UNFCCC. *Climate of Patagonia* (2013-2014).

## Opening Remarks – Prof. Oscar Frumento

With the current scenario of climate change and global warming, society is very vulnerable to the occurrence of extreme weather events. The spatial scale of these events is very wide and impacts differently according to the capacity to manage the situation.

In arid lands, for example, extreme weather events can cause flash floods (precipitation), create the appropriate conditions for the occurrence of wildfires (heat waves) causing huge impact on people's life and infrastructures.

Early warning systems are not only a task of meteorologists: other areas and public services have to be part of it. It is therefore important that the development of early warning systems is done in a joint manner with actors from the public, the academic and the private sectors.

## PANELISTS

- 1. Shri Ramesh Bhatia** served India Meteorological Department for more than 36 years and retired as Additional Director General in December, 2008. He was Permanent Representative of India with WMO and was elected as a member of the Executive Council during 15<sup>th</sup> session of WMO congress in 2007.

After undergoing training in Satellite Meteorology in CEMS, Lannion, France during 1977, he has been very actively involved in the INSAT Meteorological Applications Program of Government of India. He played a leading role in planning for all INSAT series of satellites and establishment of ground segment facilities for the meteorological applications program of these satellites right from the early stages of inception. Participated in many International and national meetings and Conferences related to satellite activities. He has published more than 50 research papers in various journals/proceedings of conferences.



As in-charge of Instrumentation and telecommunications activities for a few years, he has made significant contributions in establishment of Doppler Weather Radar Network in the Department. His contributions were also important for improving the quality of Radiosonde observations, automatic weather stations and establishing new type of instruments at airport meteorological offices.

He has played a leading role in planning for overall modernization program of IMD and its implementation in a strict time bound schedule during the period 2006-2008. This program has proved to be a game changer for IMD. A large positive impact of this program has been observed on various services being provided by IMD for all sectors of National Economy, particularly on the Cyclone warning services.

After retirement from active service, he served as a Consultant in IMD for a short period. At present he is engaged in review of some of the research papers sent by the editorial Board of journal Mousam and delivering lectures on Satellite Meteorology in some of the training courses of IMD and ISRO.

He was also President of the Indian Meteorological Society during 2007-2009 and participated in the first two meetings of IFMS.

## Opening Remarks – Mr. Ramesh Bhatia

An efficient and effective Early Warning System for weather and climate is very essential for Socio-economic developments in all parts of the world. WMO is now encouraging all Member countries to take adequate steps for its development and to make appropriate improvements from time-to-time based on new developments and experiences. Focus all over the world is now on impact - based forecasts which eventually lead to specific actionable items of work in order to minimize the impact of adverse weather. While National Meteorological and Hydrological Services (NMHSs) have the mandate of providing accurate and timely forecasts / warnings for weather and climate, it is equally important to have effective coordination with all other agencies which take subsequent actions to minimize the adverse impact. This is where all Meteorological Societies in the world can play a vital role by increasing public awareness. Only proper actions at appropriate times will ensure minimum adverse impact. Key components of EWS are:

1. NWP models running on Very fast computers and generating NWP products, followed by expert's intervention for interpretation of products and their real-time use after proper value addition.

2. Generating forecasts and warnings
3. Dissemination to different users (Strong and efficient IT based systems)
4. Infrastructure availability for timely actions by different agencies.

By making timely Capital investments in developments of all these systems, the quality of overall service can be improved considerably. Significant economic benefits from such investments generally continue for a long time during subsequent years. In India, lot of capital investments were made during 2007-2009 for modernization of different components of weather/ climate services. All these investments have proved to be the major game changer. In particular, death tolls from cyclonic storms have reduced drastically from 2013 onwards. Death tolls due to heat waves have also reduced drastically as a result of improvements in EWS. Further reductions in death tolls from some of the weather-related events like Lightning strikes, severe thunderstorms, cloud bursts, land- slides and floods is a major challenge. These are the areas of very high priority for focus by the government agencies.

Long term Socio-economic gains of making capital investments for improving infrastructure of weather/climate services are much more than the original investments. IFMS, through the meteorological societies, can make useful contributions in this regard.

**2. Dr. Agnes Kijazi** Dr. Agnes Kijazi is the Director General of the Tanzania Meteorological Authority (TMA); Permanent Representative of Tanzania with the World Meteorological Organization (WMO); Third Vice President of WMO; and a member of the WMO Executive Council since 2012.



She is the first woman from Africa to hold such a high position in the WMO. She has more than 30 years of working experience in the field of Meteorology starting from the lowest ranks while holding various managerial positions within TMA. She has extensively contributed in the leadership, development and implementation of various national and International Meteorological related programmes, as such she led the development and implementation of MH-EWS and its SOPs in Tanzania. She holds a PhD in Meteorology and has published a number of research findings in peer reviewed Journals.

### **Opening Remarks of Dr. Agnes Kijazi**

Inherent variability of the weather and climate systems poses risks to human life and property. Global climate changes have contributed to an increase of the risks, not only in the developing world but also in the developed countries. Recent IPCC reports indicate a continued increase in extreme weather and climate events in terms of frequency and intensity across the globe, which are also being associated with frequent and more intense hazards, thus threatening human safety and properties. In this case, developing and Least Developed Countries (LDCs) are the most vulnerable to the impacts of hazards triggered by climate variability and change. Addressing the observed impacts is an urgent intervention that requires *inter alia*, effective Multi-Hazard Early Warning Systems (MHEWS), particularly in developing and Least Developed Countries (LDCs) where the vulnerability is high. Effective MH-EWS have demonstrated to have enormous benefits to support early action. However, developing and Least Developed Countries (LDCs) have capacity gaps that constrain effectiveness of MH-EWS. In ensuring that MH-EWS benefit developing and Least Developed Countries (LDCs), it is important for key actors and stakeholders in Early Warning Services (EWSs) to develop sustainable measures for addressing the contributing factors, particularly addressing the capacity gaps including implementing the Impact Based Early Warning Services (IBEWS).

**Key words:** climate change impacts, multi-hazards, disasters, effective Multi-Hazard Early Warning Systems (MH-EWS).

- 3. Jim Abraham**, President of CMOS is well known meteorologist - nationally and internationally - and is frequently invited as an expert by a variety of organizations and the media.



Jim managed a wide variety weather, water, and environmental operational and research programs over a 36-year career with the Meteorological Service of Canada.

His most proud accomplishment was starting the Canadian hurricane forecast and research program,

Jim was awarded the Patterson Medal for Meteorology in 2003, the Queens Jubilee Medal in 2013, and a Fellow of the Canadian Meteorological and Oceanographic Society in 2017.

### **Opening Remarks of Mr. Jim Abraham**

With the federal government's priority on enabling resilience to climate change, emerging work in Canada is focused on understanding risks. The new Cabinet appointed by the Prime Minister has created a separate Minister for Emergency Management, in addition to the existing Public Safety Minister.

The Emergency Management Strategy for Canada is undertaking a major work to develop a national risk profile. A few of these initiatives will be highlighted.

The Meteorological Service of Canada is leading much of the hazard detection and forecasting for weather related hazards, in particular to improve lead times at least out to the seasonal time frame.

Dissemination and communications include an Alert Ready System.

Much of the Early Warning System is challenged by the need to be well coordinated between federal, provincial/territorial and municipal agencies.

## **FINAL SESSIONS PLAN FOR IGM-07 –**

### **IN NOVEMBER-DECEMBER 2021**

The following is the Program for IFMS Global Meeting (**IGM-07**) which was held in five sessions defined in the following Table. The first Session was held in two parts to make it convenient for Western and Eastern Hemispheres to participate and make presentation on their Society. All Members Societies were requested to make a presentation. Non-members could also be given an opportunity to make a presentation subject to availability of time. Multi-Society entities like SAMA were also welcome to make a presentation.

Our aim was to make it an educational IGM in which National Meteorological Societies (**NMSocs**) get to know each other better which will be helpful for them to collaborate operationally as well as in S&T. Sessions 1A and 1B were meant to achieve that.

We also wanted to educate people about IFMS, its activities, its Value Proposition and its contribution to Education and Training. Sessions 2 and 3 were meant to achieve that.

In order to interact with public at large, we held a Public Lecture on Global Warming and Climate Change (GW&CC) followed by a high-level Panel Discussion.

Finally, given that GW&CC are happening, we arranged a session on how a “Multi-Hazard Early Warning System (MH-EWS)” can save lives and how the benefits of such a system be made available to Developing and Least Developed countries.



## IFMS Global Meeting/Conference #7 Program

#	TIME	Topic	Presenters/Moderators/Panelists
<b>Session 1: Get to know your partners – Presentation by Member Societies to highlight their activities</b>			
1	All member societies made a presentation on their activities in approximately 8 minutes each and then the Moderator led the discussion. This session was held in two parts 1A and 1B over two days (Nov. 17 and Nov. 18, respectively) to cover Western and Eastern parts of the Globe.		
1A	Nov. 17, 2021 10:00 AM NY (15:00 UTC)	<b>Western Hemisphere Version</b>	<b>Moderators: Dr. Keith Seitter and Dr. Jack Hayes</b> Presenters: Jim Abraham (Canada), Ella Clarke (UK), Keith Seitter (USA), Tafesse Gurmu (Ethiopia), Shanti Majithia (EMS), Alvaro Scardilli (Argentina), Graciela Salaberri (Latin Countries), Jay Trobec (IABM), Andrea Király (Hungary), Someshwar Das (SAMA), Mathew Ndaki (Tanzania), Pablo Fernandez de Arroyabe Hernaez, Juan Ayón Alfonso (Cuba), Mario Caferra (Uruguay)
1B	Nov. 18, 2021 at 00.00 NY (05:00 UTC)	<b>Eastern Hemisphere Version:</b> 8:00 AM East Africa, 10:30 AM India, 1:00 PM China and Taiwan, 2:00 PM Japan and Korea and 4:00 PM Sydney time.	<b>Moderators: Prof. Sushil Dash and Dr. Buruhani Nyenzi</b> Presenters: Luke Sutherland (New Zealand), Roger Dargaville (Australia), Deepak Paudel (Nepal), Marcelino Villafuerte (Philippines), D. R. Pattanaik (India), Nigel Tapper (IAUC), Buruhani Nyenzi (Africa), Chian-Yi Liu (Taiwan)
<b>Session 2: IFMS Education and Training (E&amp;T) Program and a Panel Discussion on IFMS Activities in E&amp;T</b>			
2	Nov. 24, 2021 8:00 AM NY (13:00 UTC)	<b>Importance of Creating NMSocs (30 minutes).</b> IFMS assistance in Capacity Building through Training was conducted through a Panel Discussion with sufficient time for Q&A (total 90 Minutes). The total overall session was approximately 2.5 hours.	Presentation by Dr. Harinder Ahluwalia <b>Moderator: Prof. Sushil Dash</b> Panelist: Dr. Liz Page, Dr. Buruhani Nyenzi, Dr. Ajit Tyagi, and Dr. Harinder Ahluwalia
<b>Session 3: Presentation on Value Proposition of IFMS and Panel Discussion on Future Activities of IFMS</b>			
3	Dec. 1, 2021 8:00 AM NY (13:00 UTC)	<b>Presentation on IFMS Value Proposition and Financial arrangements (30 minutes).</b> A Panel Discussion on direction of IFMS ensued. Each panelist made opening remarks (total 30 Minutes) and the rest of the time (one hour) was devoted to Q&A and discussions.	Presentation of 30 minutes made by Dr. Harinder Ahluwalia. <b>Moderator: Dr. Jack Hayes</b> Panelists: Dr. Walter Dabberdt, Mr. Vladimir Tsirkunov, Mr. Tatsuya Kimura, Mr. Michel Jean and Dr. Buruhani Nyenzi,
<b>Session 4: Public Lecture on Global Warming and Climate Change &amp; Panel Discussion on GW&amp;CC and Remedies to minimize it</b>			
4	Dec.8, 2021 8:00 AM NY (13:00 UTC)	<b>Public Lecture on Causes and effects of Global Warming and remedies and actions we can take to protect ourselves (40 mins)</b> Panel Discussion on GW&CC Effects and Remedies to minimize damage.	Public Lecture was covered by Dr. Harinder Ahluwalia <b>Moderator: Dr. Mike Farrar</b> Panelists: Dr. Ladislaus Chang'a, Dr. M. Mohapatra, Dr Joseph Mukabana, Prof. Tsegaye Tadesse & Mr. Kung Yueh Chao
<b>Session 5: Presentation on Multi-Hazard Early Warning System and a Panel Discussion on situation in various countries</b>			
5	Dec. 15, 2021 8:00 AM NY (13:00 UTC)	<b>Presentation on European Multi-Hazard Early Warning System (MH-EWS) A4EU (Anywhere for Europe) and implementation of A4EU in Spain.</b> Panel Discussion on MH-EWS and on how benefits of MH-EWS can reach Developing and Least Developed Countries.	<b>Presentations by Prof. Daniel Sempere and Dr. Xavi Llor</b> <b>Moderators: Dr. Harinder Ahluwalia and Prof. Oscar Frumento</b> Panelists: Prof. Daniel Sempere, Dr. Xavi Llor, Dr. Agnes Kijazi, Mr. R. C. Bhatia, Mr. Jim Abraham.

