

### **DAY-1 activity report (14 December, 2020)**

The annual national symposium of Indian Meteorological Society, TROPMET-2020 is organized virtually with the theme “**Weather and Climate Services over Mountainous Regions**” during 14-17 December, 2020, jointly by North Eastern Space Applications Centre (NESAC) and Indian Meteorological Society – Shillong Chapter. For the first time this symposium is conducted virtually which controlled from NESAC, Shillong. The symposium has received overwhelmed response with more than 450 registrations and 315 abstracts. In addition, 12 plenary lectures, 13 invited talks, 2 memorial lecture, 1 popular lecture, and one special talk by Dy Secretary General of World Meteorological Organisation is planned during the four days of the symposium.

#### **Inauguration Program**

The inauguration program of the symposium was conducted during 10:00 AM to 11:15 AM on 14 December, 2020. Hon'ble Secretary of Ministry of Earth Sciences, Dr M N Rajeevan was the Chief Guest while Shri Moses K Chalai, Hon'ble Secretary of North Eastern Council, Shillong was the guest of honour. The panel during the inauguration program also included Dr M Mohapatra, Director General of Meteorology, IMD; Shri P L N Raju, Director, NESAC; and Dr D R Pattanaik, Secretary, IMS.



*Lighting of lamp digitally and invocation in progress*

The program started with an invocation by NESAC students and lighting of holy lamp digitally. This was followed by welcome address by Shri P L N Raju. He welcomed all

the panellists and the participants and thanked IMS for giving the opportunity to NESAC and IMS-Shillong Chapter to host TROPMET-2020. He informed that it was initially planned to be a physical symposium, however due to the movement restrictions because of COVID-19 pandemic, the symposium was conducted virtually. He briefed about all the preparations made and requested delegates to actively participate in technical sessions and plenary talks.

Dr D R Pattanaik welcomed the participants and the panellists on behalf of IMS. He briefed about IMS activities and the importance of Tropmet symposium at national level. He informed that two legendary meteorologists from India, Dr S Raghavan and Dr G B Pant left us for the heavenly abode. IMS paid digital tribute to both of them.



*Tribute to Dr S Raghavan and Dr. G B Pant*

Dr Pattanaik also informed that the Secretary General of World Meteorological Organisation (WMO) has wished for the success of the TROPMET-2020 and has deputed Dr Elena Manaenkova, Deputy Secretary-General, WMO to deliver a talk during the valedictory session. He read out the message from WMO on this occasion. He also mentioned that WMO conducted a High Mountain Summit during 2019 and a video depicting the proceedings of the Summit was sent from WMO for screening during the event. The documentary was screened.

**TROPMET 2020**  
**National Symposium on**  
**WEATHER AND CLIMATE SERVICES OVER MOUNTAINOUS REGIONS**  
**14-17 DECEMBER 2020**



**WMO OMM**  
World Meteorological Organization  
Organisation météorologique mondiale  
Organización Meteorológica Mundial  
Всемирная метеорологическая организация  
المنظمة العالمية للأرصاد الجوية  
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**Message from WMO**

WMO congratulates the Indian Meteorological Society for organizing the virtual symposium on weather and climate services over mountain regions.

WMO attaches great importance to the development of better climate services for the mountainous Hindu-Kush region, known as the Third Pole, which provides water supplies for about 45% of the world's population.

Mountains are often referred to as "the water towers" of the world. Rising global temperatures are causing changes to mountain meteorology, hydrology, and ecology, and increasing the risk of local and downstream disasters.

In this context, the symposium is an important event for fostering coordination on adapting the weather and climate services to meet evolving needs of mountain and downstream regions.

We wish you a successful event.

Dr Elena Manaenkova, the Deputy Secretary General of WMO, will be pleased to address the symposium during the concluding segment.

*Message from WMO*

Dr M Mohapatra during his address explained the reason for selecting the theme of the current TROPMET symposium. The importance of weather and climate services for the mountainous regions including the complex NE region of India and its challenges were highlighted by him. This was followed by virtual release of the souvenir cum abstract volume by Chief Guest and Guest of Honor.



*Release of Souvenir cum abstract volume*



Guest of honor, Hon'ble Secretary, NE council stressed on the importance of improved services and enhancement of observatories to address the challenge posed by severe weather and climate change that can derail the livelihood options for the indigenous population living over the mountainous regions. Chief Guest of the program, Hon'ble Secretary, MoES stressed on the utilization of advanced technology and greater involvement of younger generation to develop solutions for the problems faced by the population living in mountainous regions. There was a consensus that different department need to join hands to address the complex problems of weather and climate services over the mountainous regions.



*The inauguration program is in progress*

## **PLENARY SESSION – 1**

The first plenary session of TROPMET was conducted during 11.30-13.15 Hrs at at Himalaya Hall. The session was chaired by Prof S. K. Dube and Prof. U.C. Mohanty. There were three lectures during this session by Dr. M. N. Rajeevan, Secretary, MoES on India's Monsoon Mission, followed by Dr. M. Mohapatra, DG, IMD on Impact Based Forecasting & Risk Based Warning: Advancement & Challenges. The last lecture of the session was by Dr. Satheesh Shenoi, Former Director, INCOIS on Discovery of barotropic sea level variability in the tropical Indian Ocean driven by Madden–Julian Oscillation.

Dr. Rajeevan explained the details of Indian Monsoon Mission in a very efficient and brief manner. He pointed out how the monsoon mission growing up in India day by day. He further extended his explanation regarding the future prospect of the monsoon research and its necessity. Dr M. Mohapatra further added the IMD's new concept of Impact based forecasting system & Risk based warning system. He explained how such methodology combines the traditional Numerical Weather Prediction model and big data analyses using Artificial Intelligence. Later on Dr.

Satheesh Shenoel elaborated the research on the discovery of barotropic sea level variability in the tropical Indian Ocean driven by the Madden-Julian Oscillation.



*Plenary Session 1 is in progress*

## Technical Sessions

There were three technical sessions, TS-1A, TS-1B, TS-1C running in parallel during 14:15 - 16:15 hrs at Himalaya Hall, Brahmaputra Hall, and Ganga Hall respectively.

### TS-1A: Lightning Physics and Forecasting (Theme-2)

TS-1A was conducted at Himalaya Hall and was chaired by Col Sanjay Srivastava, Chairperson, CROPC and Co-Chaired by Dr Sunil Pawar, Sr Scientist, IITM, Pune.



*Technical Session 1A is in progress*



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The lead talk of the session was delivered by Dr Sunil Pawar, IITM on Spatial and temporal change in lightning activity over India. This was followed by ten more presentations by delegates. Different presenters presented their research work in a coherent manner. The interesting fact is that, along with the forecasting and model validation, researchers are also concentrate on the science aspect of the analyses. Different young researchers from various part of India participated and presented their work in an enthusiastic manner.

Lightning characteristics in various phases of thunderstorm, severe lightning events, electrical property of deep convective cloud, cyclonic lightning, lightning forecasting with lightning data assimilation, seasonality study of convective and stratiform rainfall, physical mechanism of MCS, Thunderstorm Prediction was presented. it was felt that studies on lightning physics will improve the forecasters model as well. Studies on lightning physics in India is in their preliminary phase and it seems that all the researchers need a one-day workshop to understand various kind of lightning data and atmospheric electricity parameters. Experts also suggested that the detection efficiency of the lightning outside of the sensor network would be worst specially over ocean area that can debar good studies and need to take care.

**TS-1B: Numerical weather prediction, data assimilation, and forecasting (Theme-3)**

The Session was chaired by Prof Someshwar Das, Central University of Rajasthan and co-chaired by Smt Rekha B Gogoi, Scientist, NESAC. The lead talk for the session was delivered by Dr. Govindan Kutty, Associate Professor, IIST on “An Ensemble-based Forecast Sensitivity Approach to Estimate the Impact of Satellite-derived Atmospheric Motion Vectors in a Limited Area Model”. This was followed by 11 presentations by the delegates.

The presentations were from varied field of numerical modelling such as ensemble prediction system for heavy rainfall events and tropical cyclones, radar data assimilation for convective scale thunderstorm simulation, biomass burning event simulation and high resolution air quality prediction. Additionally there were presentations on object-based verification of cyclones simulated by NCUM modelling system and status of UM regional coupled suite over Indian domain is also discussed.

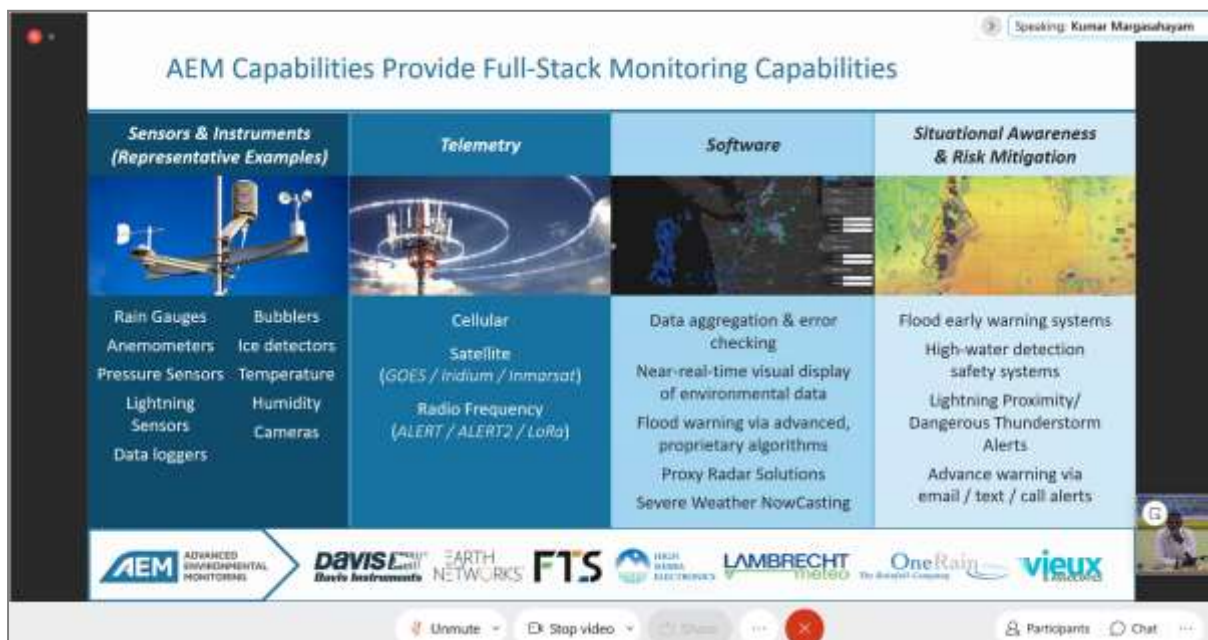
**Session TS-1C: Monsoon dynamics and prediction (Theme-4)**

The session was chaired by Prof. P. V. S. Raju from Amity University and was co-chaired by Dr. R. K. Giri from IMD, Delhi. The session saw a total of 9 presentation including a lead talk by Prof. P. V. S. Raju “on Indian Summer Monsoon - 2020 in NCEP Global and Forecasts System”. He discussed about the 2020 monsoon features as represented by NCEP forecast system. The session had some

interesting presentations talking about diverse topics from evaluation of monsoon predictions by numerical models and reanalysis, like the new IMDAA reanalysis, to the impact of different tele-connections on Indian monsoon. The presentation on IMDAA reanalysis was interesting as it showed it to have appreciable reliability over the Indian subcontinent making it a good choice for future analysis over India. The session also saw presentations on the features of extreme heavy rainfall events.

### Industry Presentation

This session was chaired by Shri P L N Raju, Director, NESAC and Co-Chaired by Shri M Somorjit Singh, Scientist, NESAC. Two industries M/s NEEPCO (North East Electric Power Corporation) and M/s EARTH NETWORKS presented during this session.



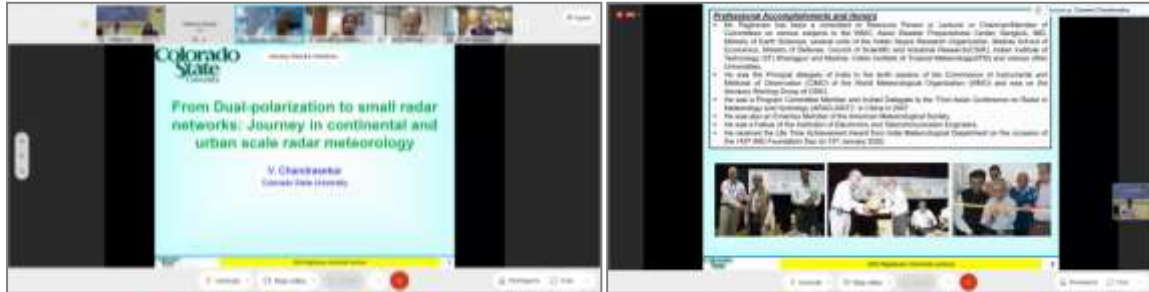
*The industry presentation is in progress*

### Dr S Raghavan Memorial Lecture

The last program of the day was Dr Raghavan memorial lecture. Dr. N. Jayanthi, Former ADGM, IMD was the Chairperson for this session. The lecture was delivered by Dr. V. Chandrasekar, University Distinguished Professor, Colorado State University, USA on Radar Meteorology for Complex Terrain: Small Radar networks. The talk highlighted the importance of Radar, particularly the small radar for nowcasting of severe storms. His experience with US radar network was explained and covered many basic parameters of polarimetric radar. He also emphasised on challenges of extreme precipitation and its forecasting. He highlighted the gap between the observation and modeling and called on to reduce the gap. He mentioned that the scenario is poor in



India. He also stressed on citizen centric instrument network to encourage interest in meteorology.



*Dr S Raghavan Memorial Lecture is in progress*



*Panellists during the Dr S Raghavan Memorial Lecture along with the Tropmet-2020 local organizing committee*