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IMD NEWS

INDIA METEOROLOGICAL DEPARTMENT
(Ministry of Earth Sciences)



JUL-SEP 2021

Volume 14

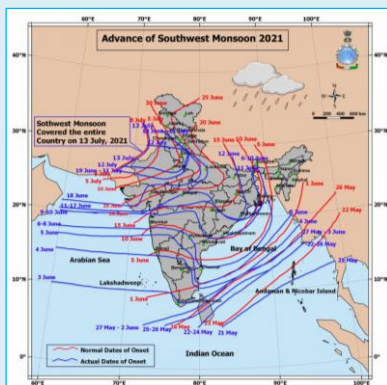
Number 3

Monthly Weather Summary

July

Advance of SW Monsoon 2021

In association with continued prevalence of moist easterly winds from the Bay of Bengal in the lower troposphere levels, enhanced cloud cover and occurrence of scattered to fairly widespread rainfall activity during previous twenty four hours, the Southwest Monsoon further advanced (Shown in the Fig.) into most parts of Rajasthan and Punjab and some more parts of Haryana and West Uttar Pradesh on 12th July, 2021, against the normal date of 8th July, 2021.



Movement of Western Disturbances and a cyclonic circulation in the lower troposphere levels over North Pakistan and neighbourhood have caused fairly widespread to widespread rainfall / thunderstorm activity over Jammu Kashmir & Ladakh, Himachal Pradesh and Haryana.

August

Low Pressure Area

A Well Marked Low Pressure Area laid over southeast Uttar Pradesh & neighbourhood on 1st; over southwest Uttar Pradesh & adjoining northwest Madhya Pradesh on 2nd and over northwest Madhya Pradesh & neighbourhood on 3rd and then weakened into a Low pressure area in the early morning hours and lay over the same region on 4th August, 2021.

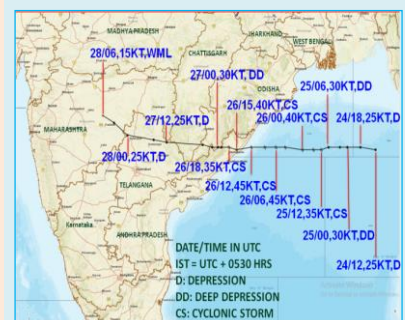
A Low Pressure Area formed over the over Westcentral & adjoining Northwest Bay of Bengal off north Andhra Pradesh- south Odisha coasts in the afternoon of 16th and laid over Northwest and adjoining West central Bay of Bengal off south Odisha- north Andhra Pradesh coasts in the evening of the same day and over coastal Odisha and adjoining Northwest Bay of Bengal on 17th August, 2021.

A Low Pressure Area formed over Northwest and adjoining West central Bay of Bengal off south Odisha- north Andhra Pradesh coasts in the morning of 28th and persisted over the same areas on 29th August, 2021. It laid over south Chhattisgarh & neighbourhood on 30th August, 2021. During its course of westward movement, it caused fairly widespread thunderstorm activity.

September

Cyclonic Storm GULAB

A low pressure area formed over eastcentral Bay of Bengal (BoB) and neighbourhood in the morning (0830 hours IST) of 24th September. It laid as a well marked low pressure area in the same afternoon (1430 hours IST) over east central and adjoining northeast BoB. Under favourable environmental and sea conditions, it concentrated into a depression over east central and adjoining northeast BoB in the evening (1730 hours IST) of 24th September. It intensified into the **cyclonic storm "GULAB"** over northwest and adjoining west central BoB in the evening (1730 hours IST) of 25th September, 2021. Thereafter, it intensified gradually and reached its peak intensity of 75-85 kmph gusting to 95 kmph around noon (1130 hours IST) of 26th September. On 27th, it caused extremely heavy rainfall at isolated places. On 28th, it caused heavy to very heavy rainfall over West Madhya Pradesh, Madhya Maharashtra, Saurashtra & Kutch and heavy to very heavy rainfall at many places with extremely heavy rainfall at isolated places over Gujarat region.



Published by

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Weather Summary

Update of Southwest Monsoon 2021

Dr. M. Mohapatra, DG, IMD presented updates on the long range forecast for second half of southwest monsoon season and the month of August and September, 2021. The highlights of the update are presented below:

- Rainfall over the country as a whole during the **second half** (August to September period) of the 2021 southwest monsoon season is most likely to be normal (95 to 105 % of Long Period Average (LPA)) with a tendency to be in the positive side of the normal.
- Sea surface temperatures over central and east equatorial Pacific Ocean is showing cooling tendency and there is an increased possibility of re-emergence of the La Nina condition in the end of the monsoon season or thereafter.
- As the changes in the sea surface temperature (SST) conditions over the Pacific and the Indian Oceans are known to influence the Indian monsoon, IMD is carefully monitoring the evolution of sea surface conditions over these Ocean basins.
- Monthly rainfall over the country as a whole during September 2021 is most likely to be above normal (> 110 % of Long Period Average (LPA)).
- The latest global model forecasts indicate that the prevailing cool ENSO neutral conditions are likely to continue over the equatorial Pacific Ocean and the negative IOD conditions are likely to continue over the Indian Ocean during September. However, sea surface temperatures over central and east equatorial Pacific Ocean is showing cooling tendency and there is an increased possibility of re-emergence of the La Nina condition at the end of the monsoon season or thereafter.

Long Range Forecast for the rainfall during post monsoon season (October-December, 2021)

The salient features are:

- 2021 Northeast Monsoon (October to December (OND)) season rainfall over the south Peninsular India consisting of five meteorological subdivisions (Tamil Nadu, Coastal Andhra Pradesh, Rayalaseema, Kerala and South Interior Karnataka) is most likely to be normal (89-111% of Long Period Average (LPA)).
- Monthly rainfall for the 2021 October over the south Peninsula is most likely to be normal (87-113 % of Long Period Average (LPA)).
- The sea surface temperatures (SSTs) over central and east equatorial Pacific Ocean are showing cooling tendency and the latest global model forecasts indicate that there is an increased possibility of re-emergence of the La Niña conditions during northeast monsoon season.

Performance of SW Monsoon 2021

- The southwest monsoon seasonal rainfall during June to September for the country as a whole had been normal (96 - 104% of Long Period Average (LPA)).
- Quantitatively the all India monsoon seasonal rainfall during 1 June to 30 September 2021 had been 87.5cm against the LPA of 88.1cm (99% of its LPA) based on data of 1961-2010.
- The southwest monsoon seasonal (June to September) rainfall over the four homogeneous regions had been Normal over Northwest India (96%) and Central India (104%). It had been below normal over East and Northeast India (88%) and above normal over South Peninsula India (111%).
- The southwest monsoon seasonal (June to September) rainfall over the monsoon core zone, which consists of most of the rain fed agriculture regions of the country had been 107% of LPA and hence above normal (>106% of LPA).

Verification of SW Monsoon 2021

Region	Period	Forecast (% of LPA)	Actual Rainfall
			(% of LPA)
		(issued on 16 th April)	
All India	June to September	Normal (96-104% of LPA) 98± 5 of LPA	99
		(issued on 1st June)	
All India	June to September	Normal (96-104% of LPA) 101± 4 of LPA	99
Northwest India	June to September	Normal (92-108% of LPA)	96
Central India	June to September	Above Normal (>106% of LPA)	104
Northeast India	June to September	Below Normal (<95% of LPA)	88
South Peninsula	June to September	Normal (93-107% of LPA)	111
Monsoon Core Zone	June to September	Above Normal (>106% of LPA)	107
All India	July (issued on 1st July)	July: Normal (94-106% of LPA)	93
All India	August & Aug-Sept (issued on 2nd Aug)	August: Normal (94-106% of LPA)	76
		Aug+Sept: Normal (95-105% of LPA)	99
All India	September (issued on 1st Sept)	Above Normal (>110% of LPA)	135

Significant Events

Swachhta Pakhwada was held at IMD from 1-15 July, 2021. This included **tree plantation programme** in the office compound, drawing competition for children, essay competition on Swachhta for officers and staffs and overall cleaning of the office.

Launching of **"Pune Live weather App"** by **Dr. M. Rajeevan**, Secy MoES on 27th July, 2021 in presence of **Dr. M. Mohapatra**, DG IMD and other senior delegates on the occasion of MoES Foundation day Celebration. The App is developed by Surface Instrument Division under CRS Pune.

Dr. Jitendra Singh, Hon'ble Minister of Earth Sciences visited IMD on 18th July, 2021. **Dr. M. Mohapatra**, DG, IMD briefed the Minister about various activities of IMD.

Dr. M. Rajeevan, Secretary, MoES inaugurated **Urban Metrological Services for Delhi NCR Region** in august presence of DGM and senior Officers of MoES and IMD on 30th July, 2021.



राजभाषायी निरीक्षण

माननीय संसदीय राजभाषा समिति की दूसरी उपसमिति द्वारा दिनांक 23 अगस्त, 2021 को मौसम केंद्र- गोवा का गोवा में राजभाषायी निरीक्षण किया गया। इस निरीक्षण कार्यक्रम में मुख्यालय से डॉ. के. के. सिंह, वैज्ञानिक 'जी', श्रीमती सरिता जोशी, सहायक निदेशक (राजभाषा) तथा वरिष्ठ अनुवाद अधिकारी श्रीमती कल्पना श्रीवास्तव ने भाग लिया।



डॉ. के. के. सिंह, वैज्ञानिक 'जी' तथा श्रीमती सरिता जोशी, सहायक निदेशक (राजभाषा) राजभाषायी निरीक्षण के दौरान

हिंदी दिवस समारोह

कोविड-19 की परिस्थितियों को ध्यान में रखते हुए मुख्यालय में दिनांक 14 सितंबर, 2021 को हिंदी दिवस समारोह का सफलतापूर्वक आयोजन किया गया। हिंदी दिवस समारोह की अध्यक्षता डॉ. मृत्युंजय महापात्र, महानिदेशक ने की तथा मुख्य अतिथि श्री दीक्षित दनकौरी, सुप्रसिद्ध गज़लकार रहे।



डॉ. मृत्युंजय महापात्र, महानिदेशकद्वारा व अन्य हिंदी दिवस दौरा के 2021न

Inauguration of DWR & GPS based pilot-sonde at MO Jammu by Hon'ble Minister

Dr. Jitendra Singh, Hon'ble Minister of State (Independent Charge), Ministry of Science & Technology and Earth Sciences,

Minister of State, Prime Minister's Office, Ministry of Personnel, Public Grievances and Pensions, Department of Atomic Energy and Department of Space, Government of India has inaugurated tower based dual polarized X-band Doppler weather radar (DWR) and Indigenous GPS based Pilot Sonde at Meteorological Office Jammu at on 5th September, 2021.

Inauguration of pilot-sonde system by Hon'ble Minister Dr. Jitendra Singh

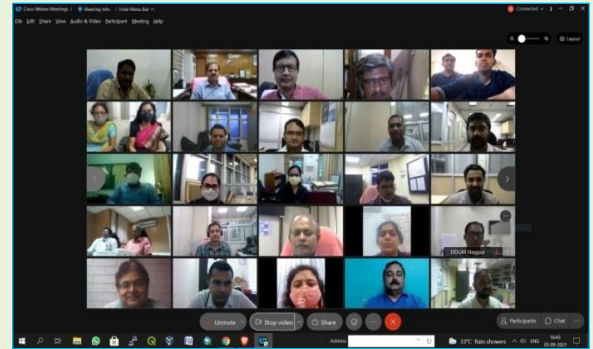


Uniform website in IMD

IMD has introduced uniform website of Regional Meteorological Centres and Meteorological Centres



rainfall- methods and Case study of Maharashtra Heavy rainfall spell and associated hazards and impact on 14-24 July, 2021. **Shri S. K. Manik**, Sc. 'C', **Ms. Hemlata Bharwani**, Sc. 'C' and **Sh. Asok Raja**, Sc. 'C' also participated in the workshop. **Sh. Rahul Saxena**, Sc. 'F' and **Dr. Ashok Kumar Das**, Sc. 'E' gave presentations on "Impact based Forecast through FFGS" and "Impact based Forecast for riverine floods" respectively in the workshop.



Dr. M. Mohapatra, DG IMD and others during workshop

Human Resource Development Activities

PANEL DISCUSSION

Dr. M. Mohapatra, DG delivered an invited talk on "Role of RSMC New Delhi in managing tropical cyclones over the north Indian Ocean and the new initiatives at IMD during 2020" on 20th September, 2021 48th Session of "Panel on Tropical Cyclones. Mrs. Sunitha Devi S., Sc. 'F' and Mrs. Monica Sharma, Sc. 'D' presented the "Review of cyclone season 2020 & 2021" and "The country report of India" and "Tropical Cyclones Operation Plan (TCP-21)" respectively during the meeting.

WORKSHOP

Dr. Kuldeep Srivastava, Sc. 'E' and Dr. Sankar Nath, Sc. 'E' attended Part 1 of the RA II (Training) Workshop on "Regional WIGOS Centres (RWC) Functions and Tools" held over two online sessions on 5th and 12th July, 2021 respectively.

Dr. S. Bandyopadhyay, Sc. 'F' attended a Review workshop of "GKMS (DAMU) Project" on 30th July, 2021 and Chaired a technical session. The meeting was organized by ICAR-Agricultural Technology Application Research Institute, Kolkata.

Dr. K. K. Singh, Sc. 'G' participated in Review workshop of "DAMU programme" at KVKs organized by ICAR ATARI Jabalpur 2nd August, 2021.

Dr. K. K. Singh, Sc. 'G' participated in Online Review workshop on "Gramin Krishi Mausam Sewa (GKMS) project" under DAMU, organized by ICAR-ATARI Kanpur on 5th August, 2021.

Dr. Kuldeep Srivastava, Sc. 'E', Mrs. Suman Gurjar, Sc. 'D' and Shri Avnish Varshney, Sc. 'D' attended Workshop on "Geodetic Network Adjustment for High Resolution 2D/3D Surveys for NSDI Application Development" on 26-27 August, 2021.

IMD Organized 1st National Workshop on "Impact Based Weather Forecasting" during 30th August-3rd September, 2021 with participation of 166 Scientists from IMD, IITM, NCMRWF, GSI, NCCR, INCOIS (https://internal.imd.gov.in/press_release/20210828_pr_1211.pdf). Dr. M. Mohapatra, DG IMD inaugurated the workshop.

Dr. R. K. Jenamani, Sc. 'F' presented four lectures in the workshop covering Basics of Events, Hazards, Exposure, Vulnerability and how to compute Risk matrix. IBF Heavy

Dr. S. Bandyopadhyay, Sc. 'F' attended inaugural function of Refresher Course on "Impact Based Weather Services" on 30th August, 2021 via video conference, organized by MTI Pune.

Dr. K. K. Singh, Sc. 'G' and Dr S D Attri, Scientist G participated in a workshop on "National Agriculture Disaster Management Plan (NADMP)" on 24th September, 2021. NADMP is India's first comprehensive DM plan of any sector and the workshop will also encourage other Ministries and Departments to prepare their own DM plans.



Dr. K. K. Singh, Sc. 'G', Dr. S. D. Attri, Sc. 'G', Shri S. C. Bhan, Sc. 'F' and Shri Kripan Ghosh, Sc. 'F' and Shri R. Balasubramanian, Sc. 'E', Dr. S. Goroshi, Sc. 'E', Dr. Ashutosh Kumar Misra, Sc. 'D', Mrs. Priyanka Singh, Sc. 'C', Dr. Lata Vishnoi, Sc. 'C' and

Dr. Asha Latwal, Sc. 'C' attended the Online Review workshop on **"Gramin Krishi Mausam Sewa (GKMS) project for the DAMUs"** in Karnataka and Kerala, organized by ICAR-ATARI Bengaluru on 24th September, 2021 and 4th online workshop on **"Next Gen Climate Services Dash Board"** organised by International Crop Research Institute for Semi-Arid Tropics (ICRISAT), Hyderabad held on 28th September, 2021.

MEETINGS / VIDEO CONFERENCES

Dr. (Smt) Manorama Mohanty, Sc. 'E' attended on line **"Weather Watch Group meeting"** with State Govt. Officials headed by the Relief Commissioner, Govt. of Gujarat, Gandhinagar on 6th, 13th and 20th July, 2021.

Dr. H. R. Biswas, Sc. 'E' attended the **"Crop Weather Watch Group Committee Meeting for Kharif – 2021"** under the chairmanship of Agriculture Production Commissioner, Govt. of Odisha, on 5th, 13th, 19th and 26th July, 2021 and on 2nd, 9th, 23rd and 31st August, 2021.

Shri Raja Acharya, Met. 'A' attended the virtual workshop **"International Conference on Disaster Risk Management"** held during 30th June - 1st July, 2021, hosted by the Climate Resilient Observing Systems Promotion Council (CROPC) New Delhi, IMD and MoES.

Shri B. P. Yadav, Sc. 'F' and **Ms. Hemlata Bharwani, Sc. 'C'** attended meeting of **Hydrometry Sectional Committee, WRD** on 9th July, 2021 organised by Water Resource Department, Bureau of Indian Standards.

Dr. Ashok Kumar Das, Sc. 'E' attended the 3rd PMC meeting of **"Early Warning System for Flood Prediction in the River Basins of India"** under National Supercomputing Mission organized by CDAC, Pune on 12th July, 2021.

Shri B. P. Yadav, Sc. 'F', **Shri Rahul Saxena, Sc. 'F'**, **Dr. Ashok Kumar Das, Sc. 'E'**, **Ms. Hemlata Bharwani, Sc. 'C'** and **Shri Asok Raja, Sc. 'C'** attended the first virtual introductory meeting on **"HydroSOS implementation in Ganges-Brahmaputra-Meghna river basins"** organized by Hydrology and Water Resources Division (HWR), WMO on 15th July, 2021.

Dr. Jayanta Sarkar, Sc. 'F' attended a virtual meeting with the Hon'ble Chief Minister, Maharashtra on 18th July, 2021 regarding **Monsoon Scenario on Maharashtra**.

Shri P. S. Kannan, Sc. 'E' and **Shri K. Raja, Met. 'B'** attended online meeting regarding **Annual Review Workshop** under GKMS - ATARI Zone X, Hyderabad on 19th July, 2021.

Dr. Kuldeep Srivastava, Sc. 'E' attended **Meeting for discussion of GIS Data and NSDI** on 20th July, 2021 through VC.

Dr S D Attri, Scientist G and **Dr. H. R. Biswas, Sc. 'E'** attended the meeting on **"Improving Food Security for Smallholder Farmers in Odisha using Climate Resilient Practices- A proposal from World Food Programme"** under the chairmanship of

Commissioner-cum-Secretary, Deptt. Of Agriculture and Farmer's Empowerment, Govt. of Odisha on 23rd July, 2021.

Dr. K. K. Singh, Sc. 'G' participated in **"6th National Review Conference of Pradhan Mantri Fasal Bima Yojna (PMFBY)"** on 24-25 July, 2021 and submitted inputs/presentation during a session **"Direct Yield Estimation using Technology Challenges & Way Forward"** on 24th July, 2021.

Dr. M. Mohapatra, DG, IMD participated in the inaugural session of the **"International Conference on Clouds and Precipitation (ICCP-2021)"** on 2nd August, 2021.

Dr. M. Mohapatra, DG, IMD participated in the 1st Foundation Day Celebration of South Asian Meteorological Association (SAMA) on 3rd August, 2021.

Dr. K. K. Singh, Sc. 'G' and **Dr. S. D. Attri, Sc. 'G'** attended annual conference on **"Ensuring Food and Nutrition Security in the context of Climate Change and Corona Pandemic"** on 6th, 9th and 10th August, 2021 through VC.

Dr. M. Mohapatra, DG, IMD attended the meeting of Expert Group on **"Developing Strategy on Environment Health/Climate Change/ Air Pollution and Covid-19 Pandemic"** on 9th August, 2021.

Dr. Ashutosh Sharma, Secretary MoES and **Dr. M. Mohapatra, DG, IMD** attended the meeting on 10th August, 2021 to discuss **the outcome of PC-SAMS meeting** held on 4th August, 2021.

Dr. M. Mohapatra, DG, IMD attended the meeting with Dr. Sultan Singh, Head (GIS), GMDA regarding setting up of Environment and Climate Monitoring System at Gurugram and Faridabad District on 13th August, 2021.

Dr. M. Mohapatra, DG, IMD attended the High Level Committee Meeting for **"Preparation of its draft report on Barge P 305 incident during cyclone Tauktae"** on 16th August, 2021.

Dr. M. Mohapatra, DG, IMD has Chaired the **"2nd Feedback and Suggestion session"** of IMD Work Flow Dashboard through online WebEx VC meeting on 17th August, 2021.

Smt. Indira Murthy, Joint Secretary MOES, Shri Manoj Abusaria, Joint Director MOES, Dr. Jayanta Sarkar, Sc. 'F', Smt. Shubhangi Bhute, Sc. 'E' and **Smt. Sarita Gupta, Director Hindi Section, DGM New Delhi** attended Hindi Parliamentary Committee meeting at Goa on 23rd August, 2021.

Shri Raja Acharya, Met. 'A' attended the virtual conference **"IAGA-IASPEI 2021"** which was organized at Hyderabad by the ASPEI, IAGA, NGRI, CSIR, DST and MoES during the period 21-27 August, 2021.

Dr. M. Mohapatra, DG, IMD attended the meeting with **Regional Association-II (RA-II) Management Group of WMO** on 24th August, 2021.



Dr. M. Mohapatra, DG, IMD participated in an interactive meeting with Chennai Weather Bloggers about **“Peninsular India weather”** on 29th August, 2021.

Dr. M. Mohapatra, DG IMD participated in meeting regarding **“Landslides”** at Ministry of Home Affairs, North Block, ND on 31st August, 2021.

Dr. M. Mohapatra, DG IMD participated in the meeting of high level policy dialogue on **“Localizing climate resilience agenda: Vision 2050 and 2100 (LOCC_RES 2100)”** on 2-3 September, 2021.

Dr. Somnath Dutta, Sc. ‘F’ attended the **“3rd WMO CDP meeting”** virtually on 15-16 September, 2021

Dr. K. K. Singh, Sc. ‘G’, **Dr. S. D. Attri**, Sc. ‘G’, **Shri S. C. Bhan**, Sc. ‘F’ and **Shri Kripan Ghosh**, Sc. ‘F’, **Shri R. Balasubramanian**, Sc. ‘E’, **Dr. S. Goroshi**, Sc. ‘E’, **Dr. Ashutosh Kumar Misra**, Sc. ‘D’, **Mrs. Priyanka Singh**, Sc. ‘C’, **Dr. Lata Vishnoi**, Sc. ‘C’ and **Dr. Asha Latwal**, Sc. ‘C’ attended Meeting on **“Dissemination of value-added Block level weather forecast”** with Senior Scientists from IMD, New Delhi, IMD, Pune and RMCs & MCs of IMD organized by AASD, IMD, New Delhi on 13th September, 2021 and meeting on **“Integration of the State Govt’s IT platform with IMD services”**, for dissemination of weather information and Agromet Advisories, with officials from AASD-New Delhi, Agrimet Div. Pune, RMCs and MCs of IMD organized by AASD, IMD, New Delhi on 21st September, 2021.

Dr. M. Mohapatra, DG, IMD participated in the **“National Crisis Management Committee Meeting on cyclone Gulab”** on 25th September, 2021.

Dr. M. Mohapatra, DG, IMD, **Dr. Kamaljit Ray**, Sc. ‘G’, **Dr. Ashish Mitra**, **Dr. S. D. Attri**, Sc. ‘G’, **Shri K. S. Hosalikar**, Sc. ‘G’, **Dr. D. R. Pattanaik**, Sc. ‘F’ and **Dr. R. K. Giri**, Sc. ‘F’ participated in the **“17th Regional Association-II”** from 27-30 September, 2021. **Dr. M. Mohapatra**, DG, IMD made a presentation on **“Regional Partnership and sub-regional Cooperation-Initial Outcome of the draft RA-II Partnership Strategy”** on 27th September, 2021.



Dr. Kripan Ghosh, Sc. ‘F’ and **Shri R. Balasubramanian**, Sc. ‘E’ attended International conference on **“12th session of South Asian Climate Outlook Forum (SASCOF-20)”** and

“Climate Services User Forum (CSUF)” during 27-30 September, 2021.

Dr. M. Mohapatra, DG, IMD participated in the **“103rd Governing Council Meeting”** of IITM, Pune on 30th September, 2021.

Shri B. P. Yadav, Sc. ‘F’, **Shri Rahul Saxena**, Sc. ‘F’, **Dr. Ashok Kumar Das**, Sc. ‘E’, **Ms. Hemlata Bharwani**, Sc. ‘C’ and **Shri Asok Raja**, Sc. ‘C’ attended a VC meeting with WMO members on 30th September, 2021 to discuss on **“Hydro-SOS GBM Project & Regional Workshop”** scheduled on 22-23 November, 2021 in New Delhi, India.



Hydro-SOS GBM Project Meet with WMO, IMD

मुख्यालय की राजभाषा कार्यान्वयन समिति की वर्ष 2021 की तीसरी तिमाही बैठक डॉ. एस. डी. अत्री वैज्ञानिक-‘जी’ की अध्यक्षता में दिनांक 29.09.2021 को वर्चुअल माध्यम से आयोजित की गई। इस बैठक में पृथ्वी विज्ञान मंत्रालय के संयुक्त निदेशक (राजभाषा) और उपकार्यालयों के अधिकारी वर्चुअल माध्यम से उपस्थित रहे।

LECTURES/ TALK

Dr. M. Mohapatra, DG, IMD delivered Keynote speech and released **“Annual Lightning Report 2020-2021”** during international conference on **“Lightning and disaster risk management”** on 1st July, 2021.

Dr. M. Mohapatra, DG, IMD addressed Press Conference on **“Long Range Forecast of southwest monsoon season”** and participated in live discussion with the media persons on 1st July, 2021.

Dr. M. Mohapatra, DG, IMD participated in the launch ceremony of the **“First Hydromet Gap Report-Weather, Climate and water services to Underpin Sustainable Development”** organized by Hydromet Development and United Nations Department of Economic and Social Affairs on 8th July, 2021.

Shri B. P. Yadav, Sc. ‘F’ delivered an invited talk on **“Cloudburst and Floods”** organized by IMD and NIDM on 27th July, 2021.

Shri Amul Batra, Sc. ‘E’ delivered lectures on **“An introduction to AI/ML for data analysis, image interpretation and enhancement”** on 28th July, 2021.

Dr. K. K. Singh, Sc. ‘G’ delivered Inaugural address on 2nd August, 2021 as Chief Guest in three weeks certificate course on **“Weather Based Agromet Advisory Services through ICT”** from 2-

22 August, 2021 organized by Mahatma Phule Krishi Vidyapeeth, Rahuri under World Bank Aided ICAR- NAHE project.

Dr. M. Mohapatra, DG, IMD presented an invited talk on “**Early Warning for Weather and Climate Hazard over Odisha**” in the programme organized by Think Tank Odisha on 7th August, 2021.

Dr. (Smt.) K. Naga Ratna, Sc. ‘E’ delivered a lecture on “**Climate Forecasting System in INDIA**” in the workshop and Focus Group Discussion organized by IIT, Hyderabad for Indonesian stake holders, on 10th August, 2021.

Dr. M. Mohapatra, DG, IMD delivered an invited talk during **Kharif Outlook Webinar** organized by India Pulses and Grains Association, Mumbai on 13th August, 2021.

Shri Avnish Varshney, Sc. ‘D’ delivered a lecture regarding “**Catastrophic modelling/ meteorological implementation-usage of remote sensing and GIS with AI techniques**” on 19th August, 2021.

Dr. S. Bandyopadhyay, Sc. ‘F’ delivered a lecture in a National Work Shop (virtual) on “**Technology support and mass awareness for Prevention of Lighting Casualties**” organized jointly by University of Kolkata, Tripura University and IET-UK Kolkata local network, on 30th August, 2021.

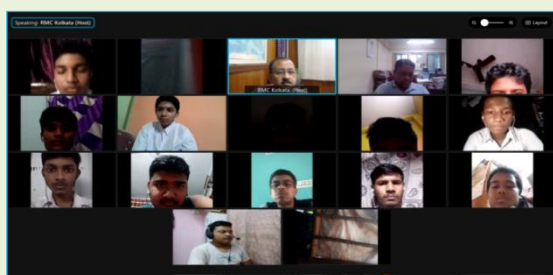
Dr. S. Balachandran, Sc. ‘F’ participated and delivered a lecture in **Online IRS Training and Table Top Exercise for floods scenario** on 2nd September, 2021.

Dr. S. D. Attri, Sc. ‘G’ delivered Address in the Valedictory function at AMITY University, Noida on the occasion of “**International Day of Clean Air for Blue Skies 2021**” on 7th September, 2021.

Dr. S. D. Attri, Sc. ‘G’ was invited for talk on “**Socioeconomic Drought management through Community Engagement**” organized by NIDM on 14th September, 2021.

Dr. S. Bandyopadhyay, Sc. ‘F’ attended Hindi Day program and delivered a lecture highlighting “**Importance of the language in day to day official as well as in personal life**” on 14th September, 2021.

Dr. S. Bandyopadhyay, Sc. ‘F’ delivered a lecture to the students and teachers from Barasat MGM High School, Nabapally, Kolkata and East Calcutta National School, Kolkata, on “**Cyclone forecast and Disaster Mitigation**”, on 23rd September, 2021.



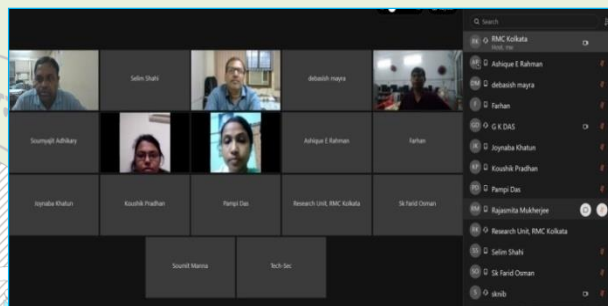
Dr. Geeta Agnihotri, Sc. ‘F’ delivered a lecture on 84th All India Watermanship course on the topic “**Weather Forecasting during Floods Home-Guards and Civil Defence**” on 28th September, 2021.

Dr. M. Mohapatra, DG, IMD delivered a talk on “**Early Warning Systems and Multi Hazards**” in the MoES “**UKRI COP-26 Partnership Event: Sustainable and Inclusive Climate Adaptation and Resilience: Local Leadership for a global goal**” on 29th September, 2021.

WEBINAR

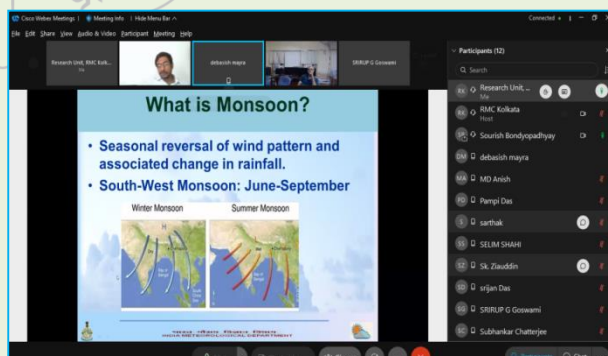
Shri Raja Acharya, Met. ‘A’ attended the “**Virtual Atmosphere-Cryosphere-Ocean seminar series (VACO-21)**”, jointly organized by the International Association of Cryospheric Sciences, International Association of Meteorology and Atmospheric Sciences and International Association of the Physical Sciences of the Oceans during 19-23 July, 2021.

Dr. G. K. Das, Sc. ‘E’ delivered a lecture to the students and teachers from Santragachi Kedarnath Institution, Howrah and The Kiderpore Academy, Kolkata, on the topic “**Forecast and Impact of Cyclone YAAS for West Bengal**” in the campaign - **Azadi ka Amrit Mahotsav : “Prithvi Vigyan se Jan Kalyan”**.



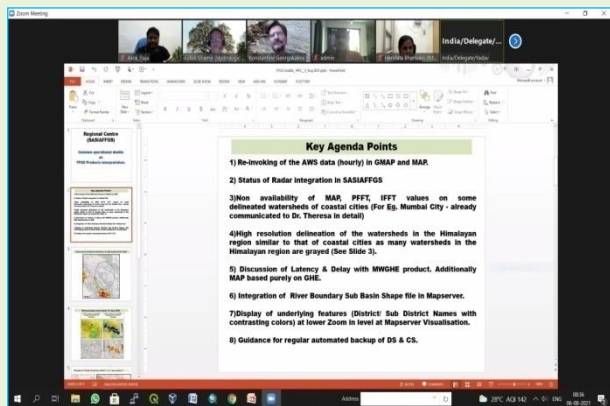
Dr. G. K. das delivering lecture on “Forecast and Impact of Cyclone YAAS for West Bengal”

Dr. Sourish Bondyopadhyay, Sc. ‘C’ attended a Webinar on 30th July, 2021 and delivered a lecture to the students and teachers from Santragachi Kedarnath Institution, Howrah and The Kiderpore Academy, Kolkata, on the topic on - “**Monsoon and its impact for West Bengal**” in the campaign - **Azadi ka Amrit Mahotsav : “Prithvi Vigyan se Jan Kalyan”**.



Dr. S. Bandyopadhyay, Sc. ‘F’ delivering lecture

Shri B. P. Yadav, Sc. ‘F’, **Shri Rahul Saxena**, Sc. ‘F’, **S. K. Manik**, Sc. ‘C’, **Ms. Hemlata**, Sc. ‘C’ and **Shri Asok Raja**, Sc. ‘C’ attended the webinar with HRC and WMO experts on “**South Asia FFGS technical issues and system enhancements**” on 6th August, 2021.



Technical Interaction with HRC & IMD

Dr. M. Mohapatra, DG, IMD attended the “SAHF Webinar Series-3” organised by RIMES for development of an optimal infrastructure for South Asia on 17th August, 2021.

Dr. K. K. Singh, Sc. ‘G’ attended One Day National Seminar on “Ozone Layer and its effect on Livestock” Organized by Institute of Livestock Management and Ministry of Earth Sciences Govt. of India on 16th September, 2021.



DWR hardware training at M/s AMPL, Hyderabad

TRAININGS

Shikha Verma, S. A., Komal Srivastava, S. A. and Shri Virender, S. A. attended Online CSSTEAP Short Course on “Coastal Zone Management in Response to Natural Hazards and Climate Variability” conducted by Indian Institute of Remote Sensing, ISRO, Dept. of Space, Govt. of India, Dehradun (India) through virtual platform during 26th July- 6th August, 2021.

Dr. (Smt.) K. Naga Ratna, Sc. ‘E’, Dr. (Smt.) A. Sravani, Sc. ‘C’ and Dr. A. Dharma Raju, Sc. ‘C’ attended a Regional training programme on “National Database for Emergency Management (NDEM) Version 4.0” which was conducted by National Remote Sensing Centre (NRSC), Hyderabad on 27th July, 2021.

To best utilize ‘Grammarly Premium’ a 30-minutes training followed by 15 minute Question and Answer session, for the users of India Meteorological Department has been conducted through Webinar on 3rd August, 2021.

To best utilize resource of ‘DERCON (Digital Earth Consortium), MoES’, for the Scientist/Researchers and other users of India Meteorological Department a one-hour training of the Nature.com platform followed by 15 minute Question and Answer session, has been conducted through Webinar on 13th September, 2021.

To best utilize resource of ‘DERCON (Digital Earth Consortium) KRCNET, MoES’ for the Scientist/Researchers and other users of India Meteorological Department a 45-minutes training by Elsevier to “Accelerate research planning using Scopus” followed by 15 minute Question and Answer session on 20th September, 2021 and for “Effective research execution using

Science Direct & Mendeley” on 21st September have been, conducted through Webinar.

Shri B. A. M. Kannan, Sc. ‘E’, Shri Bibraj, Sc. ‘C’, and Shri V. Aravindan, R. M., DWR Chennai imparted hands-on training in “DWR Calibration and Measurements (Doppler Weather Radar-Maintenance course)” to IAF officials at IAF Sulur in Coimbatore from 27th September, 2021 to 1st October, 2021.

Five IMD officers have been imparted DWR hardware training with regard to newly installed X-band dual polarized DWRs. The training was conducted in factory location of M/s Astra Microwave Private Limited, Hyderabad during September, 2021.

PRESENTATION

Dr. R. K. Jenamani, Sc. ‘F’ participated in International Conference on “Disaster Risk Management” on 30th June - 1st July, 2021 organized by CROPC and presented paper on “Advancement in Technology in Risks Based Early Warning and Impact based Forecasting”.

Dr. H. R. Biswas, Sc. ‘E’ gave a presentation as a Guest Speaker on the topic “Cyclone disaster and early warning systems” on 6th July, 2021 in the Online Training Programme on the broad theme “Capacity Building on Application of Technology in Disaster Management and Disaster Risk Reduction” organized by Sri Sri University, Cuttack, Odisha in collaboration with National Institute of Disaster Management, New Delhi.

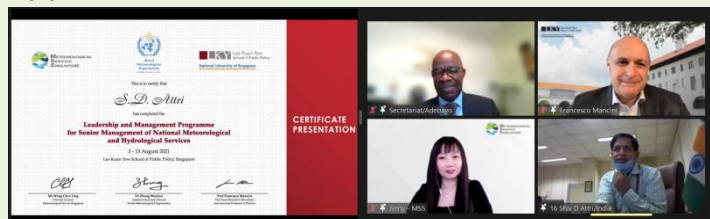
Shri Vivek Sinha, Sc. ‘F’, Shri Aashish Kumar, Sc. ‘C’ and Shri Aanand Shankar, Sc. ‘C’ visited Environment, Forest and Climate Change Department of Bihar Govt. on 12th August, 2021 and gave a presentation to Shri Dipak Kumar Singh, Chief Secretary, I.A.S on “Air Quality Product” generated by India Meteorological Department.

Dr. Sanjeev Dwivedi, Sc. ‘C’ gave an Oral Presentation at International Workshop named “Water and Air Research Societal health (WaARISH)” through online virtual mode during 24-25 August, 2021.

OUTREACH PROGRAMME

Dr. S. D. Attri, Sc. ‘G’ attended “Leadership and Management Programme for Senior Management of National

Meteorological and Hydrological Services” organised by WMO, NUS and MSS Singapore during 3-13 August, 2021. He also delivered invited talk on **“Weather and Climate Services in India”**



The Department of International Affairs and Outreach, IIT Indore organized a Public Lecture on **“Cyclone forecasting”** by **Dr. M. Mohapatra**, DG, IMD on 5th August, 2021.

Dr. K. K. Singh, Sc. ‘G’ participated in **Orientation Programme** organized for Nodal Officers of Krishi Vigyan Kendra’s (KVKs) on **“Preparation and dissemination of Agromet Advisories at Block Level under Gramin Krishi Mausam Seva (GKMS) scheme”** during 26-28 August, 2021 to cover all DAMUs in the country.

Dr. S. D. Attri, Sc. ‘G’ attended **“International Climate Summit 2021”** organised by PHD Chamber of Commerce and industry on 3rd September, 2021 in New Delhi.



Dr. M. Mohapatra, DG, IMD participated in the 20th Session of South Asian Climate Outlook Forum (SASCOF-20) on 27th September, 2021.

Dr. M. Mohapatra, DG, IMD participated in the 17th Formation Day Ceremony of NDMA at Sushma Swaraj Bhavan, Chanakaya Puri on 28th September, 2021.

NOMINATIONS

Shri Sunny Chug, Sc. ‘C’ has been nominated to the interview board for the selection of logistics personal for the 41st Indian Scientific expedition to Antarctica by NCPOR (MoES) Interview held on 16-24 August, 2021.

ONLINE INTERVIEW

Dr. M. Mohapatra, DG, IMD attended live Interview by **Bloomberg TV, Reuters, News Rise** on **“Southwest monsoon”** on 5th and 6th, 8th July, 2021 respectively.

Dr. M. Mohapatra, DG, IMD gave an Interview to **Ershot Media Group, Krishi Jagran media group** and **DD Shillong** on **“Southwest monsoon”** on 13th July, 29th July and 4th August, 2021 respectively.

Dr. K. K. Singh, Sc. ‘G’ as chairman of expert board conducted interview on 2nd August, 2021 at the end of ongoing training at MTI for newly recruited scientists.

Correspondent of Russian TV interviewed **Dr. M. Mohapatra**, DG, IMD on 4th August, 2021 regarding **“Southwest monsoon rainfall in India”**.

Ms. Nivedita Khandekar, Journalist, IANS, interviewed **Dr. M. Mohapatra**, DG, IMD on 11th August, 2021 regarding **“Southwest monsoon”**.

Dr. M. Mohapatra, DG, IMD was interviewed by **Mr. Ishaan Kukreti**, Environment Journalist regarding **“Evolution of IMD”** on 18th August, 2021.

Shri Anand Shankar, Sc. ‘C’ and **Shri Ashish Kumar**, Sc. ‘C’ have attended the interview panel as expert to select the scientist for **Bihar Mausam Seva Kendra Society** of Revenue Department, Govt of Bihar.

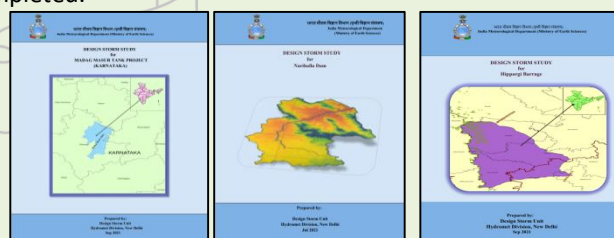
Infrastructure Development & Installations

New **DIWE Data logger with mini slave display** was installed by MC Bhubaneswar at Current Weather Unit and **Mini slave display with adopter** was replaced on ATC Tower Bhubaneswar on dated 31st July, 2021.

Under the scheme of installation of **Manual Surface Observatory** in the district HQs of Odisha, new PTO became functional at Bhadrak on 26th August, 2021 and at Jajpur on 27th August, 2021.

Uniform website has been launched by IMD in month of August. Launch of 12 uniform websites for remaining MCs.

Design Storm Studies of Madag Masur Tank, Narihalla Dam and Hippargi Barrage, Karnataka got completed and DPR sent to concerned authority and Design Storm Study in r/o 3 Sub Zones of Shani Devgaon High Level Barrage, Maharashtra has been completed.



DSS on Madag Masur Tank, Narihalla Dam and Hippargi Barrage

Inter-Agency Meetings

Dr. K. K. Singh, Sc. ‘G’ attended a meeting on **“SATARK Application Developed for Agriculture Risk Monitoring System under the RIMES-OSDMA Project”** scheduled through Microsoft Teams on 2nd July, 2021 under the Chairmanship of Director of Agriculture and Food Production, Odisha.

Dr. M. Mohapatra, DG, IMD participated in the meeting of the Departmental related Parliamentary Standing Committee regarding **“Update on Monsoon situation in the country at Committee Room “A” Parliament House”** on 9th July, 2021.



Dr. M. Mohapatra, DG, IMD participated in the **2nd Meeting of PC-SAMS** Under Chairmanship of Principal Scientific Adviser to GOI through VC on 14th July, 2021.

Dr. V. K. Soni, Sc. 'F' participated in **"WMO/UNEP Ozone Research Managers of the parties to the Vienna Convention for the Protection of the Ozone Layer Eleventh Meeting"**-part II Online meeting held during 19–23 July, 2021.

Dr. M. Mohapatra, DG, IMD participated as Chief Guest and delivered an Invited Lecture in the ceremony organized by Alumni Association, Utkal University on 24th July, 2021.

Dr. M. Mohapatra, DG, IMD participated in the meeting with **Shri Sandeep Poundrik**, Director General, Coalition for Disaster Resilient Infrastructure, New Delhi on 26th July, 2021.

Dr. M. Mohapatra, DG, IMD participated in the meeting of the peer committee on **"Technological Preparedness for dealing with National Disruption"** on 26th July, 2021.

Dr. M. Mohapatra, DG, IMD participated in the **3rd Meeting of PC-SAMS** under the chairmanship of Principal Scientific Adviser to Government of India on 4th August, 2021.

Dr. M. Mohapatra, DG, IMD participated in the meeting with **Dr. Joanne Robbins**, Science Manager-Weather Impacts Team, Met. Office UK regarding **"WCSSP India WP4 Programme"** on 5th August, 2021.

Dr. M. Mohapatra, DG, IMD attended the meeting with **Shri Atanu Chakraborty**, Director, National Sales, Quantum Storage on 6th August, 2021.

Dr. M. Mohapatra, DG, IMD attended the meeting of **"Expert Group on Developing Strategy on Environment Health/Climate Change/ Air Pollution and Covid-19 Pandemic"** on 9th August, 2021.

Dr. Ashutosh Sharma, Secretary MoES and **Dr. M. Mohapatra**, DG, IMD attended the meeting on 10th August, 2021 to discuss the outcome of PC-SAMS meeting held on 4th August, 2021.

Dr. M. Mohapatra, DG, IMD attended the meeting of the Consultative Committee of the Ministry of Jal Shakti, Department of Water Resources, RD & GR during the Parliament Session on 10th August, 2021.

Dr. M. Mohapatra, DG, IMD attended the meeting regarding **"Cyclone early warning and disaster related matters"** involving CDRI, Power Sector of Odisha & Goa and Steel Plant of Visakhapatnam on 12th August, 2021.

Dr. M. Mohapatra, DG, IMD, **Dr S D Attri**, Sc. G, **Dr V K Soni**, Sc F and **Dr R K Giri**, Sc F attended the meeting with **Dr. Sultan Singh**, Head (GIS), GMDA regarding **setting up of Environment and Climate Monitoring System** at Gurugram and Faridabad District on 13th August, 2021.

Dr. K. K. Singh, Sc. 'G' chaired the 6th meeting of the **"Project Monitoring and Advisory Committee"** 11th August, 2021.

Shri Umasankar Das, Sc. 'C' attended the **"Crop Weather Watch Group Committee Meeting for Kharif-21"** on virtual mode under the Chairmanship of Agriculture Production Commissioner, Odisha on 16th August, 2021.

Dr. S. D. Attri, Sc. 'G' attended the Meeting with ASGI Bangalore through VC on 4th September, 2021.

Dr. S. D. Attri, Sc. 'G' attended the Meeting on **Sub-Group II (Energy Producer) of Standing Committee and Sub-groups for thematic deliberations** chaired by the Principal Scientific Advisor to Government of India on 6th September, 2021.

M.C. Patna made a presentation before the State Cabinet chaired by Hon'ble Chief Minister of Bihar on **"Monsoon Performance over the state and its impact on the flood and drought situation in different part of the State"** on 7-8 September, 2021.

Dr. S. D. Attri, Sc. 'G' attended the Meetings regarding **"Nature-Journal"** and the **Training activities of IMD** on 13th September, 2021.

Dr. R. K. Jenamani, Sc. 'F' attended **"INDO-UKMO WCSSP India 3rd Quarterly EC Meeting"** held on 20th September, 2021 and presented IMD Work progress in **Impact based Forecast System and Risk based warning WP4** and status of project with other centers of MoES. **Dr. M. Mohapatra**, DG, IMD also addressed this progress review meeting.

Dr. M. Mohapatra, DG, IMD participated in the meeting organized by Ministry of Home Affairs through VC to discuss the **various measures needed to be taken to reduce the deaths caused by Lightning in the country** on 29th September, 2021.

Dr. S. D. Attri, Sc. 'G' chaired **"Quarterly Rajbhasha (Hindi) Meeting"** on 29th September, 2021.

Dr. S. D. Attri, Sc. 'G' attended the Meeting regarding **"Indo-UK Research and Innovation (UKRI)"** organized by Ministry of Earth Sciences and delivered inputs on **"Food security"**.



Media Interaction

Special Weather Bulletins (Informatory Messages), Press Releases, Port Warnings and Fishermen Warnings were issued to

State Govt Offices, Media and General Public and all concerned users during 22-24 July, 2021 in connection with **formation of Well-Marked Low Pressure Area over north West Bay of Bengal off north Odisha West Bengal coasts** and during 26-27 July, 2021 due to **formation of Low Pressure Area over North Bay of Bengal and neighbourhood**, which further into Well-Marked Low Pressure Area over coastal Bangladesh and adjoining West Bengal.

Dr. M. Mohapatra, DG, IMD participated in live discussion organized by the Indian Express on the subject **“Weather forecasting and climate change”** on 28th July, 2021.

Shri C. S. Patil, Sc. ‘D’ sent 30 Nos. of Audio bytes in Kannada and English on weather on daily basis to All India Radio Bengaluru, Kalaburgi and Dharwad for broadcasting daily during the month of July 2021.

Dr. Kripan Ghosh, Sc. ‘F’ and **Shri R. Balasubramanian**, Sc. ‘E’ attended Media interaction meeting for Maharashtra on 7th September, 2021. **Shri R. Balasubramanian**, Sc. ‘E’ presented on the topic **“Agrometeorological Services for farmers”** in the meeting.

Research & Publications

Sixteen (16) research papers were published in MAUSAM Vol. 72, No. 3 (July, 2021) issue.

Chinmaya Panda, Dwarika Mohan. Das , B. C. Sahoo, B. Panigrahi and K. K. Singh, **“Spatio-temporal modeling of surface runoff in ungauged sub-catchments of Subarnarekha river basin using SWAT”**, *Mausam*, 72, 3 (July 2021), 597-606.

K. K. Dakhore, A. S. Rathod, D. R. Kadam, G. U. Shinde, Y. E. Kadam and K. Ghosh, **“Prediction of Kharif cotton yield over Parbhani, Maharashtra : Combination of extended range forecast and DSSAT-CROPGRO-Cotton model”**, *Mausam*, 72, 3 (July 2021), 635-644.

A. Kashyapi and V. K. Shripad, **“Cyclonic storms and Depressions over the north Indian Ocean during 2020”**, *Mausam*, 72, 3 (July 2021), 531-544.

S. D. Attri and M. Mohapatra, 2021, **“Agrometeorological Services for Climate Resilient Agriculture, In: Climate Resilience and Environmental Sustainability Approaches - Global Lessons and local Challenges”**, *Springer Nature*, 1, 127-139, <https://doi.org/10.1007/978-981-16-0902-2>.

A. Dharma Raju, K. S. Hosalikar, G. C. Satyanarayana, K. S. Rao, N. Umakantha and N. Neelam **“Centuries of Heat waves over India during 20th and 21st Century”** *Applied Environmental Research- App. Envi. Res.* 43, 4 (2021), 1-13 <https://doi.org/10.35762/AER.2021.43.4.1>.

M. S. Meer, Anoop Kumar Mishra, M. Rafiq, **“Spatio-temporal Patterns of Land Use Land Cover Changes over a District in Northern India and their Impact on Environment and Society”**,

Journal of Geological Society of India, , 97, 656-660, 10.1007/s12594-021-1741-z.

Anoop Kumar Mishra and M. S. Meer, **“GIS approach for mapping novel coronavirus in northern state of India, Jammu and Kashmir”**, *Environmental Earth Sciences*, 80, 1-7, 10.1007/s12665-021-09856-4.

Bhardwaj A., V. Misra, B. Kirtman, T. Asefa, C. Maran, K. Morris, E. Carter, C. Martinez and D. Roberts, **“Experimental High-Resolution Winter Seasonal Climate Reforecasts for Florida”**, *Weather and Forecasting*, 36, 4, 1169-1182, <https://doi.org/10.1175/WAF-D-21-0004.1>.

M. T. Bushair, S. Indira Rani, Buddhi Prakash Jangid, Priti Sharma, Sumit Kumar and John. P. George, **“Evaluation of the benefits of assimilation of Meteosat-8 observations in an NWP system over the India”**, *Meteorology and Atmospheric Physics*, 0, 133, 1-1, <https://doi.org/10.1007%2Fs00703-021-00826-w>.

Satya Prakash and Jayaraman Srinivasan, **“A comprehensive evaluation of near-real-time and research products of IMERG precipitation over India for the southwest monsoon period”**, *Remote Sensing (MDPI)*, 13, 1-19, 10.3390/rs13183676.

Ahmed Rizwan, Dhanger N., Dwivedi S, Giri R. K., Pithani Prakash and Ghude, S, **“Characteristics of fog in in relation to the Tropical cyclone intensity. A case study of IGI Airport New Delhi”**, *Tropical Cyclone Research and Review*, 10, 3, 170-181, <https://doi.org/10.1016/j.tccr.2021.09.004>.

Trisanu Banik, Venugopal Thandlam, Barin Kumar De, Shyam Sundar Kundu, Rekha Bharali Gogoi, P. L. N. Raju and Anirban Guha **“Understanding dynamics of tropical cyclones in the Bay of Bengal using lightning data”**, *Meteorology and Atmospheric Physics*, 133, 1505-1522 (2021), <https://doi.org/10.1007/s00703-021-00824-y>

Amit Kumar, R. K. Giri, Ajay Kumar Taloor and Anil Kumar Singh, **“Rainfall trend, variability and changes over the state of Punjab, India 1981-2020: A geospatial approach”**, *Remote Sensing Applications: Society and Environment*, 23, 10059-10059, <https://doi.org/10.1016/j.rsase.2021.100595>.

T. Arulalan, R. Dileep kumar, Krishna Achuta Rao and Céline J. W. Bonfils, **“On the Emergence of Human Influence on Surface Air Temperature Changes Over India”**, *Journal of Geophysical Research Atmospheres*, 126, 1-12, 10.1029/2020JD032911.

Ramashray Yadav, Ram Kumar Giri, and Virendra Singh, **“Intercomparison review of IPWV retrieved from INSAT-3DR sounder, GNSS and CAMS reanalysis data”**, *Atmospheric Measurement Techniques*, 14, 4857-4877, <https://doi.org/10.5194/amt-14-4857-2021>.

Kaustav Chakravarty, N.Arun, Praful Yadav, Rupali Bhangale, P.Murugavel, Vijay P.Kanawaded, J.Mohmmad, K.S.Hosalikar and G.Pandithurai, **“Characteristics of precipitation microphysics during Tropical Cyclone Nisarga (2020) as observed over the orographic region of Western Ghats in the**

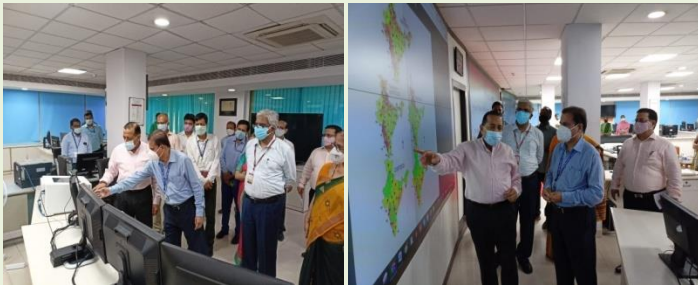


Indian sub-continent", *Atmospheric Research*, **264**, 2021, <https://doi.org/10.1016/j.atmosres.2021.105861>.

A research paper entitled "Investigation of atmospheric water vapour condensation and characteristic analysis as potable water" by Dinesh Kumar, Vidhu Agarwal, Akhilesh Tiwari, Kuldeep Srivastava has been communicated to International Journal of Environmental Science and Technology for publication.

Visitors

Dr. Jitendra Singh, Hon'ble Minister of Earth Sciences, Dr M Rajeevan, Secretary, MoES, Mrs Indira Murthy, JS, MoES and other Senior Officers of MoES visited IMD on 18th July, 2021 who were briefed by **Dr. M. Mohapatra**, DG, IMD and other Officers of IMD the Minister about various IMD activities and Services.



Shri S. Chandrasekhar, IFS, Member Secretary, Bihar State Pollution Control Board, Patna along with their team visited Meteorological Centre, Patna on 5th August, 2021 for discussing the "Air Quality Forecast" of capital city Patna.

Dr. Jitendra Singh, Hon'ble Minister of State (IC), Ministry of Science & Technology and Environment Sciences visited Ministry of Earth Sciences (MoES) for rendering of National Anthem by Indian Scientific Fraternity at Mahika Hall, MoES on 13th August, 2021. DG, IMD and other senior officers participated in the event to commemorate "Azadi ka Amrit Mahatsov".

Dr. Saibal Ghosh, Director, Geological Survey of India made a courtesy visit at IMD on 13th August, 2021.



Dr. Arabinda Mitra, Scientific Secretary, Office of Principal Scientific Advisor, Govt. of India visited MC Patna on 30th August, 2021. **Shri Vivek Sinha**, Sc. 'F' has given a presentation apprising the MC Patna multidisciplinary activities, adoption of newer technology in the field of weather forecasting and proactive approach in dissemination of weather forecast and information. He also interacted with MC Patna Officials.