



मौसम विज्ञान विभाग समाचार IMD NEWS

INDIA METEOROLOGICAL DEPARTMENT
(Ministry of Earth Sciences)



In this issue

International Brainstorming Meeting > P1

Winter Fog Experiment (WIFEX) 2016-17 > P1

NEW NWP MODELS AT IMD > P2

New NWP Models at IMD > P3

Conferences/Lectures > P4

Foreign Visits > P5

Installation & Meetings > P6

Research & Publication > P7

Award/Media Interaction/Collaboration > P8

Inauguration of TROPMET – 2016 > P8

Weather Summary > P9

Very Severe Cyclonic Storm "VARDHA" > P10

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Important Events / Activities

INTERNATIONAL BRAINSTORMING MEETING ON "AIR QUALITY AND CLIMATE IMPACTS"



Dr. M. Rajeevan, Secretary, MoES delivering inaugural address in International Brainstorming meeting on "Air Quality and Climate Impacts"

International Brainstorming meeting on "Air Quality and Climate Impacts" was organized in New Delhi during 5-7 October, 2016 by IMD in collaboration with Finnish Meteorological Institute, WMO, UNEP and WHO. The meeting was inaugurated by Dr M. Rajeevan, Secretary, MoES. One of the objectives of the meeting was to present and review current activities in India on air quality and as it is related to climate and to health in order to consider these as a whole and in relation to obtaining co-benefits. The meeting made connections between stakeholders and experts, raising awareness of the importance of the discussed issues. The meeting brainstormed on the way forward, considering technical targets, and the possibility of forming a task based cluster of the activities taking place in India in this field.

WINTER FOG EXPERIMENT (WIFEX) 2016



Dr. M. N. Rajeevan, Secretary, MoES has addressed the media after inaugurating the Joint IITM-IMD WIFEX on 6th December, 2016 at IGIA, New Delhi in the presence of Shri I. P. Rao CEO, IDAL and Dr. M. Mohaptra Sc. 'G'

Inauguration of IGI Airport Fog campaign

Dr. M. Rajeevan, Secretary, Ministry of Earth Sciences (MoES) has inaugurated the Joint IITM-IMD Winter Fog Experiment (WIFEX) on 6th December, 2016 at 1100 hrs at IGIA, New Delhi and addressed the media in the presence of Shri I. P. Rao, CEO, IDAL and Dr. M. Mohaptra Sc. 'G' services, IMD, Dr D. Pradhan, Sc. 'G' and Head RMC Delhi and Dr. R. K. Jenamani, Sc. 'F' Met Office also have attended the event. The objectives is to develop better now-casting (next 6 hours) and forecasting of winter fog on various time and spatial scales through better understanding of micro-physics and then utilization of the same in the improving the parameterization schemes of Dynamic fog Models.

Extensive sets of comprehensive ground-based instrumentation, including remote sensing platforms, are deployed at the IGIA, New Delhi. Major in-situ sensors are deployed to measure surface micro meteorological conditions, radiation balance, turbulence, thermo-dynamical structure of the surface layer, fog droplet and aerosol microphysics, aerosol optical properties, real time sky images, and aerosol and fog water chemistry. WIFEX was conducted in a pilot mode at IGIA during last winter and will be continued during December 2016 till February 2017. The main scientific objective of this project is to study the characteristics and variability of fog events and associated dynamics, thermodynamics and fog microphysics, with the aim to achieve better understanding of fog life cycle and ultimately improve capability in fog prediction.



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India Meteorological Department,
Mausam Bhawan, Lodi Road,
New Delhi - 110 003

Tel. : 011- 24651287

Telefax : 91-11-24699216 &

91-11- 24623220

email : newsletter_imd@yahoo.com

edited by

Dr. D. R. Pattanaik

compiled by

Staff of Editorial Office





STANDING PARLIAMENTARY COMMITTEE

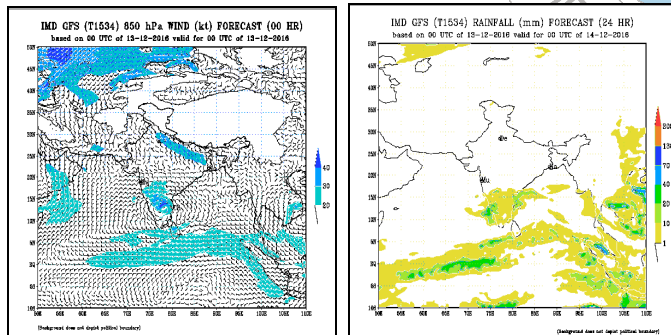
Secretary, Ministry of Earth Sciences and Director General of Meteorology have interacted with Standing Parliamentary Committee on Agriculture on the theme "Working towards making India flood and drought resilient and Comprehensive Agriculture Research based on Geographical Conditions and Impact of Climatic Changes to ensure Food Security in the Country" on 28th October, 2016.

New Projects / Schemes / Programmes Approved / Initiated / Completed

OPERATIONAL IMPLEMENTATION OF NEW NWP MODELS AT IMD

High resolution GFS model (T1534L64)

The Global Forecast System (GFS) model T1534L64 with horizontal resolution of about 12 km and 64 hybrid sigma-pressure layers with the top layer centered around 0.27 hPa (approximately 55 km) runs operationally on ADITYA High Performance Computing Systems (HPCS) at IITM Pune twice in a day (0000 & 1200 UTC) since 1st December, 2016 to give deterministic forecast in the short to medium range. The initial conditions are generated from the NCEP based Ensemble Kalman Filter (EnKF) component of hybrid Global Data Assimilation System (GDAS) run on BHASKARA HPCS at NCMRWF. For the operationalising of this model in IMD, NCMRW has provided the real-time implementation support and support for Data assimilation, whereas, the pre-operation testing and validation supports were provided by IITM.

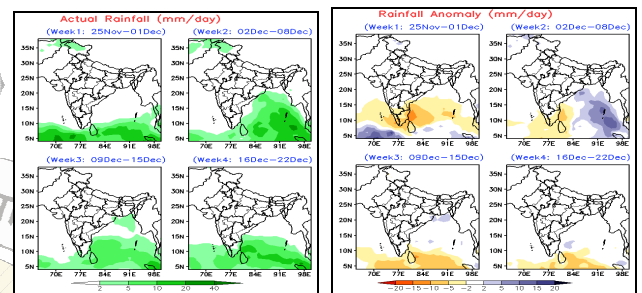


850 hPa analysis wind and 24 hr rainfall forecast plot of GFS T1534L64 based on 13th December, 2016

Coupled Modelling System CFS for Extended Range Forecast

Operational implementation of coupled model with a suite of models from CFSv2 coupled model has been implemented in IMD during July 2016. This dynamical prediction system developed at IITM has been transferred to IMD and the same has been implemented by IMD for generating operational Extended Range Forecast products to different users. This suite of models at different resolutions with atmospheric and oceanic Initial conditions obtained from NCMRWF and INCOIS assimilation system respectively are (i) CFSv2 at T382 (≈ 38 km) (ii) CFSv2 at T126 (≈ 100 km) (iii) GFSbc (bias corrected SST from CFSv2) at T382 and (iv) GFSbc at T126. The operational

suite is ported in ADITYA HPCS at IITM Pune for day-to-day operational run. The Multi-model ensemble (MME) out of the above 4 suite of models are run operationally for 32 days based on every Wednesday initial condition with 4 ensemble members (one control and 3 perturbed) each for CFSv2T382, CFSv2T126, GFSbcT382 and GFSbcT126. The same suites of model are also run on hindcast mode for 13 years (2003-2015). The average ensemble forecast anomaly of all the 4 set of model runs of 4 members each is calculated by subtracting corresponding 13- year model hindcast climatology. For the preparation of mean and anomaly forecast on every Thursday, which is valid for 4 weeks for days 2-8 (week1; Friday to Thursday), days 09-15 (week2; Friday to Thursday), days 16-22 (week3; Friday to Thursday) and days 23-29 (week4; Friday to Thursday).



The MME based extended range F/C of mean and rainfall anomaly for 4 weeks based on the initial condition of 23 November, 2016 and valid for 25 November to 22 December, 2016

National level Forecast Demonstration Project (FDP)

A forecast demonstration project (FDP) on Winter Weather System including Western Disturbance, cold wave and fog has been taken up by India Meteorological Department w.e.f. 1st December, 2016. It will continue till the end of February. A daily report is being prepared involving various diagnostic and prognostic features of winter weather system mainly affecting north India and being provided as forecast guidance to different meteorological centres and Regional Meteorological Centres. It is multi institutional mechanism involving IMD, NCMRWF, IITM and ISRO.

Dr. M. Mohapatra, Scientist 'G' participated in a meeting in IITM Pune on 14th October, 2016 for preparation of Project Report on Severe Weather Production System.

Radiation unit have introduced a new technology (GPS based systems) in tracking the sun for continuous and un-interrupted direct solar radiation measurements. The tracker is under field test from 18th October, 2016.

A team of officers and staff of RMC Guwahati was deputed to participate in MoES Exhibition held at Maniram Dewan Trade Centre Guwahati w. e. f. 23rd December, 2016.

"Monitoring of signals" of various parameters to be used for the preparation of winter precipitation over North India and monsoon forecast 2017 was in progress.

Human Resource Development Activities

IMD in collaboration with Mahatma Phule Krishi Vidyapeeth (MPKV), Pune organized Training on 'Crop Yield Forecast using statistical and crop growth simulation models' for SRFs under FASAL at College of Agriculture, Pune, Maharashtra from 18th to 21st October, 2016. Around 20 SRFs participated in the training.

Considering the importance of maintenance and calibration of meteorological instruments for weather forecasting and climate monitoring activities in South East Asia, WMO has organized a group training course on "**Instrument Maintenance and Calibration**", at the Meteorological Training Institute of the India Meteorological Department, Pune, India from 15th November to 12th December 2016. Nine delegates from different countries of RA-II and RA-V region had participated in the course. The training focussed participants to acquire knowledge and practical skills in the science of measurement as well as the care and calibration of meteorological instruments.

Dr. Kripan Ghosh, Scientist 'E' attended the Training on "Operational Techniques for combining Extended & Seasonal forecast and Model in climate risk Management in Agriculture" at ACRC,ARI, PJTSAU, Rajendranagar, Hyderabad w.e.f. 28th November 2016.

Four Hundred Ninety Three (493) students from different educational institutes/schools visited IMD-HQ for familiarization during October, 2016.

A Team of 60 students and 2 faculty members of department of Earth Sciences, University of Science & Technology Baridua, Ri-Bhoi, Meghalaya-793101 visited RMC Guwahati office on 11th November, 2016. Dr. S. O. Shaw, Scientist 'E' and Shri Sunit Das Scientist 'D' delivered lecture to the students on "Historical Timeline of Weather Observation" and Technique of weather Forecasting 'respectively.

32 students along with one teacher of DPS Kalinga, Bhubaneswar visited IMD Bhubaneswar on 2nd November, 2016.

185 students along with two teachers from DAV School Pokhariput, Bhubaneswar visited IMD Bhubaneswar on 17th November, 2016 and 18th November 2016.

A group of 40 students and teachers of Rajdhar Bora H. S. School, Azara Guwahati visited this office on 28th November, 2016.

Two Hundred Ten (210) students visited IMD-HQ, Sixty (60) students visited RMC Guwahati and Forty (40) students visited RMC Nagpur for familiarization during November, 2016.

Dr. S. L. Singh, Sc. 'F' attended NIAS-DST Training Programme held during 5-16 December, 2016 at Bengluru.

A refresher course on "Application of ensemble Prediction System for Short and Medium Range Weather Forecasting was co-organised by IITM, IMD and NCMRWF at IITM Pune during 6-8 December, 2016. About 40 forecasters from various offices of IMD participated in this training. Dr. K. Sathi Devi, Scientist 'F' and Shri Charan Singh, Scientist 'E' from National Weather Forecasting Centre, New Delhi participated in this training. Dr. D. R. Pattanaik, Scientist 'E' and Dr. Soma Sen Roy, Scientist 'E' delivered lectures in this training.

About 29 Engineering students from various colleges of Chennai as part of in-plant training in their academic curriculum, visited RMC Chennai during December, 2016. They were briefed about the functions / various activities of RMC Chennai.

Sixteen Naval Meteorological Observers from School of Naval Oceanology and Meteorology were given on-job-training (OJT) at IMD HQ during 26-31 December, 2016.

Two Hundred forty (240) students visited IMD-HQ and Forty (40) students visited RMC Nagpur for familiarization during December, 2016.

Training on GNSS equipment maintenance, calibration, configuration, and troubleshooting, the principle of GNSS meteorology will be conducted at New Delhi in the month of December, 2016 to IMD officials posted in the remote site.

WORKSHOPS

Dr. M. Mohapatra, Scientist 'G' participated in India-Bangladesh Joint Scoping Workshop on Disaster Management at INCOIS Hyderabad during 3-4 October, 2016.

Shri Ranjan Phukan, Scientist 'B' Thangjalal Lhouvum Scientist 'B', R. K. Goswami, Meteorologist 'B', Manik Ghosh, Meteorologist 'B' and V. K. Singh S. A. attended the Nowcast Training Workshop held at Arnav Hall, MoEs New Delhi, during 4-5 October, 2016.

A workshop on '**Computer and Hindi- facilities and utilities**' was arranged in PAC office on 18th October, 2016 as per official language implementation policy.

Dr. Sanjay O'Neill Shaw, Scientist 'E' was invited at Kendriya Vidyalaya Borjhar as distinguished guest on the inaugural function of the Regional Children Science Congress on 21st October, 2016. S/Shri Atul Kumar Singh Scientist 'B' and Sitangshu Deb Meteorologist 'A' also visited Kendriya Vidyalaya Borjhar as judges for regional Children Science Congress.

Dr. (Smt.) Manarama Mohanty Sc. 'D' attended a workshop on "Air pollution and Health: Laying Foundation for Effective Use of the Ahmadabad Air Quality Index" at Ahmadabad on 13th December, 2016.



INTERNATIONAL CONFERENCE ON (ICECAFE)



Shri S. B. Thampi, Sc. 'F' and Dr. S. Balachandran, Sc. 'F' during inaugurated the conference

A Three-day International Conference on Environment, Climate Change, Adaptation and Future Energy (ICECAFE) was organised by the Department of Science and Humanities, Dhanalakshmi College of Engineering, Chennai in technical collaboration with India Meteorological Department during 20-22 October, 2016. This Conference was sponsored by Ministry of Earth Sciences. Shri S. B. Thampi, Scientist 'F' inaugurated the Conference. Shri S. B. Thampi, Scientist 'F' and Dr. S. Balachandran, Scientist 'F' RMC Chennai participated in the scientific sessions.

Dr. S. O. Shaw, Scientist 'E' attended a seminar at Gauhati University, organized by Department of Physics on 4th November, 2016 and delivered a lecture on "Weather system in NE Region".

Shri Thangjalal Lhouvum, Scientist 'B' and Shri G. K. Adhikari Met 'B', were on tour to Kolkata since 8-9 November 2016 to attend "Regional Aviation Workshop" After their return from Regional Aviation Workshop at Kolkata. Shri Thangjalal Lhouvum Sc. 'B' and Shri G. K. Adhikari, Met 'B', conducted a Briefing for all the Aviation / CW Met. Personal at the station on 17th November, 2016 with regards to common procedural mistakes and practices in Aviation. Also introduction to METAR online submission and use of OLBS systems as well as RAPID products was presented.

Shri Y. K. Reddy, Scientist 'F', MC Hyderabad and Shri K. Ramachandra Rao, Scientist 'E', CWC attended a workshop on "Disaster proofing Indian Cities : Strengthening emergency services infrastructure during climate extremes" held at Vijaywada on 11th November, 2016 organised by British High Commission, Hyderabad.

WORKSHOP ON CLIMATE VARIABILITY

A consultative workshop on "Climate Variability in Kerala in Recent Years: Climate Change Perspectives" was organised by Govt of Kerala in association with IMD, MC Thiruvananthapuram and SDMA which was inaugurated by the Hon'ble Chief Minister, Shri Pinarayi Vijayan and Shri S. B. Thampi, Scientist 'F' delivered key note address in the workshop. Dr. D. S. Pai, Scientist 'F', Dr. V. K. Mini, Scientist 'D' and Shri N. T. Niyas,

Scientist 'C' participated in the Workshop on "Climate Variability in Kerala in Recent Years: Climate Change Perspectives" on 21st November, 2016 held at Thiruvananthapuram and made presentation.



Hon'ble Chief Minister of Kerala, Shri Pinarayi Vijayan and officers of IMD during the workshop

Shri D. Saha, Scientist 'F' and Shri Sunit Das Scientist 'D' attended the workshop on NWP and Interpreting Probability Forecast at IITM Pune, held during 6th to 8th December, 2016. Centre for Advanced Training, IITM Pune organized three days National Workshop on "NWP on Probabilistic Forecast". The workshop was inaugurated by Director IITM. Forecasters from State Meteorological Centres and Regional Meteorological Centres of IMD participated in the training workshops. The resource persons from IMD, NCMRWF and IITM explained how to use the available model products and also how to use the ensemble products for probability forecast.

TALK/LECTURES

Shri S. Sudevan, Scientist 'E' participated and delivered a lecture on "World Food Day Celebration" conducted by Department of Civil Suppliers Commissioner on 16th October, 2016 at Central Library Hall, Palayam, Thiruvananthapuram.

Dr. M. Mohapatra, Scientist 'G' participated and presented a talk in the one day National Seminar on "Lightning" Early Warning System" Organized by Odisha State Disaster Management Agency at Bhubaneswar on 25th October, 2016.

Shri S. B. Thampi, Scientist 'F' participated in the National Institute of Advanced Studies (NIAS-DST) Training Programme on "Policy for Science and Science for Policies" for Director/Divisional Heads held at Indian Institute of Science, Bangalore during 7-11 November, 2016.

Shri Pavan Kumar G S K, S. A, M.O Calingapatnam delivered lecture on "Meteorological Instruments" at the Sri Buddha School and students visited Observatory on 7th November, 2016.

Smt. R. Sumathi, Meteorologist 'B' delivered a lecture on disaster management at Police Academy, Greater Chennai on 8th November, 2016.

Ms. B. Amudha, Scientist 'D' delivered a lecture on 16th November, 2016 at Met. Training Centre, IMD, Pashan, Pune on the topic "Survey on alternatives for decent and obsolete instruments - WMO IOM 117" to the trainees from RA-II and RA-V attending the WMO sponsored training on "Instruments Maintenance and Calibration" being held from 15 November to 12 December, 2016.

Shri Sunit Das, Scientist 'D' delivered a lecture on "Climate of NE Region" at Gauhati University on 23rd December, 2016.



Ms. B. Amudha, Sc. 'D' with trainees from RA-II and RAV regions of WMO

Dr. S. Balachandran, Scientist 'F' RMC Chennai participated in a colloquium entitled "Recent developments in prediction of Tropical Cyclones and associated coastal hazards" at IIT Bhubaneswar during the period 15-16 December, 2016.

Shri S. B. Thampi, Scientist 'F', delivered special address and Smt D. Rajalakshmi, Scientist 'B', AMS Kozhikode presented a paper entitled "Development of forewarning model for rice yellow stem over west Bengal" in the National Symposium "AGMET2016 on Climate - driven Food Production Systems, Agrometeorological Interventions" held at Tamil Nadu Agricultural University, Coimbatore during 20-22 December, 2016.

Shri K. V. Balasubramanian, Meteorologist 'B', Shri Rm. A. N. Ramanathan, Meteorologist 'B', Smt. Sumathi, Meteorologist 'B', Shri N. Marikrishanan, Meteorologist 'B', Shri N. Ramamurthy, Meteorologist 'A' and Shri M. V. Guhan, Meteorologist 'A' delivered lectures on "Disaster management and Mitigation measures" on "Disaster management and Mitigation measures" during October-December, 2016 on six occasions to 300 trainees comprising district administrators to disaster managers of Tamil Nadu state in a training programme organised by Anna Institute of Management, Chennai.

5th National Minicoy Festival - 2016

The 5th National Minicoy Festival - 2016 was held during 27- 28 December, 2016 at Minicoy and was inaugurated by the Honourable Union Minister for Civil Aviation Shri P. A. Gajapathi Raju on 27th December, 2016 along with the Lakshadweep MP Shri Faizal, Smt. Priya Sethi, Minister for tourism, Jammu & Kashmir and the Administrator of Lakshadweep Shri Farooq Khan, head of the departments were also present on the occasion

CONFERENCES
CONFERENCE ON 'ICCCWAFS'



ICCCWAFS - ICRISAT at Hyderabad

Dr. N. Chattopadhyay, Scientist 'F', participated in the International Conference on "Climate Change, Water, Agriculture and Food Security (ICCCWAFS)" and delivered presentation on "Combating Effect of Climate Change on Indian Agriculture through Smart Weather Forecasting and ICT Application" held at ICRISAT, Patancheru, Hyderabad during 2-3 November, 2016.

FOREIGN VISITS

Dr. N. Chattopadhyay, Scientist 'F' was on foreign deputation to Geneva during 17-20 October, 2016 to attend 2nd Meeting of Management Group of WMO Commission for Agriculture Meteorology (CAGM).

Dr. Kuldeep Srivastava, Scientist 'D' was on foreign deputation to Guangzhou (China) during 21-29 November, 2016 to attend Technical Conference of Commission for Basic System (CBS-TECO 2016) and 16th Session of the Commission for Basic System (CBS-16) of World Meteorological Organisation (WMO).

Dr. K. J. Ramesh, Director General, India Meteorological Department attended 16th Session of the Commission for Basic System (CBS-16) of World Meteorological Organisation (WMO) held at Guangzhou (China) during 23-29 November, 2016.

Dr. N. Chattopadhyay, Scientist 'F' was on foreign deputation to Geneva (Switzerland) to attend Developers Meeting on the GFCS-Relevant Climate Data, Products and Tools during 6-8 December, 2016.

Dr. K. J. Ramesh, Director General, India Meteorological Department was on foreign deputation to Abu Dhabi (UAE) to attend preparatory meeting for 16th Session of Regional Association-II (RA-II) of WMO during 7-8 December, 2016 to Geneva (Switzerland) to participate in 2nd Meeting of Disaster Risk Reduction Focal Point of World Meteorological Organisation's (WMO's) Regional Association, Technical Commission Technical Programme during 14-16 December, 2016.



Infrastructure Development & Installations

Model Automatic Weather Station (AWS) displayed and demonstrated in IITF-2016 exhibition held during 14-27 November, 2016 at Pragati Maidan, New Delhi.

43 New Thunderstorm Nowcast stations were added on All India Thunderstorm Nowcast page under the jurisdiction of MC Agratala, MC Ahmedabad, MC Bhubaneswar and MC Hyderabad for issuing three hourly TS Nowcast.

RFP document for procurement of AT/RH sensors - 100 Nos., Atm. Pressure Sensors - 100 Nos. and 2.4 GHz RF modems- 400 Nos. have been prepared.

Installation of all 20 Drishti systems planned for installation at different airport is completed.

Total 190 DSB delivered to different RMCs, out of which 184 are installed.

UV-B Radiometer Installed at Coimbatore. With this the installation at all 45 radiation network station is completed.

Electronic Sunshine Recorder Installed at Nagpur and Thiruvananthapuram. With this the installation at 8 stations are completed.



Digital Sunshine recorder at MC Thiruvananthapuram

Electronic Sunshine recorder was installed on 17th November, 2016 by the officials from SI (Lab), Pune. All the sensors of Radiation instruments were calibrated during 17-19 November, 2016 using National Standard.

MEETINGS

Shri S. B. Thampi, DDGM, RMC Chennai and Dr. S. Balachandran, Scientist 'F' attended a meeting at Tamil Nadu State Secretariat convened by the Chief Secretary to Government of Tamil Nadu to take stock of preparedness for

managing North East Monsoon season rainfall and cyclones on 5th October, 2016.

Shri S. Sudevan, Scientist 'E' attended meeting on 13th October, 2016 at Chief Minister's Conference Hall to discuss the impending drought situation in the state.

COMMISSION FOR AGRICULTURAL METEOROLOGY



Second Meeting of the Management Group of WMOCAgM

Dr. N. Chattopadhyay, Scientist 'F' participated in the second meeting of the Management Group (MG) of the Commission for Agricultural Meteorology (CAgM) held at World Meteorological Organization (WMO), Geneva, Switzerland during 17-20 October, 2016, to make a comprehensive report of CAgM activities of different Expert team and Task team needs to prepare final report for the intersession period for onward submission to the Commission for the Commission for Agricultural Meteorology (CAgM) meeting will be held in 2018.

Shri N. P. Kulkarni, Scientist 'B' and Shri S. S. Mairal, Meteorologist 'A', attended the meeting on "Project on Climate Resilient Agriculture in Maharashtra (POCRA)" at Mumbai on 18th October, 2016 and briefed the activities of Agromet Advisory to delegates and future plan of the Division.

Shri S. B. Thampi, Sc. 'F' participated in the first meeting of the Advisory Committee formed by Tamil Nadu State Disaster Management Authority under Disaster Management Act 2005 on 26th October, 2016 at the Commissionerate of Revenue Administration, Chennai.

Shri S. Bagulayan Thampi, Scientist 'F' and Dr. S. Balachandran Scientist 'F' had a meeting with the Commissioner Revenue Administration, Government of Tamil Nadu on 24th November, 2016 and briefed on current status and outlook of North East Monsoon.

Dr. S. Balachandran, Scientist 'F' and Shri. R. Rajamohan Meteorologist 'B' attended a meeting on 5th December, 2016 at SDSC, Sriharikota to discuss / review on weather for PSLV-C36 launch on 7th December, 2016.

Shri Charan Singh, Sc. 'E' attended the meeting on 23rd & 27th December, 2016 at NDRF regarding establishment of the control room at NDRF office.

GLOBAL FRAMEWORK FOR CLIMATE SERVICES (GFCS)



Developers Meeting on the GFCS-Relevant Climate Data, Products, and Tools

Dr. N. Chattopadhyay, Scientist 'F' participated in the Developers Meeting on the Global Framework for Climate Services (GFCS) - Relevant Climate Data, Products and Tools at WMO, Geneva, Switzerland from 6-8 December. Dr. N. Chattopadhyay, DDGM (Agrimet) has been invited to participate in Developers Meeting on the GFCS-Relevant Climate Data, Products, and tools from 6-8 December, 2016 at Geneva under the auspices of the World Meteorological Organization (WMO) Commission for Climatology (CCI) Implementation Coordination Team on Climate Services Information System (ICT-CSIS).

Dr. S. Balachandran, Scientist 'F' briefed Chief Secretary and Commissioner of Revenue Administration, Government of Tamil Nadu and also District Collectors of Chennai, Kanchipuram and Tiruvallur on 11-12 December, 2016 regarding Very Severe Cyclonic Storm 'VARDAH', which crossed near Chennai on 12th December, 2016.

Gramin Krishi Mausam Seva (GKMS) and 7th Annual Review Meeting (ARM)



Annual Review Meeting of Gramin Krishi Mausam Seva

Dr. N. Chattopadhyay, Scientist 'F' (Agrimet), Shri R. Balasubramanian, Scientist 'D', Dr. Shirish Kedikar, Scientist 'B', Shri N. P. Kulkarni, Scientist 'B', Smt. Gracy John, Met. 'B', Shri A. P. John, Met. 'B', Shri Sanatan Das, Met. 'B' and Smt. K. Malathi, Met. 'A' attended 10th Annual Review Meeting



Annual Review Meetings - FASAL

of Gramin Krishi Mausam Seva (GKMS) and 7th Annual Review Meeting of FASAL project at Orissa University of Agriculture and Technology (OUAT), Bhubaneswar, Odisha from 1-17 December, 2016.

Research & Publications

Bhatla, R., A. K. Singh, B. Mandal, S. Ghosh, S. N. Pandey and Abhijit Sarkar, 2016, "Influence of North Atlantic Oscillation on Indian Summer Monsoon Rainfall in Relation to Quasi-Biennial Oscillation", *Pure and Applied Geophysics*, **173**, 8, 2959-2970.

Ms. B. Amudha, Scientist 'D' submitted her Ph. D Thesis entitled "Characteristics of Indian Northeast Monsoon and Cyclonic storms of North Indian Ocean Observed through Modern Meteorological Observing Systems" to the University of Madras on 26th December, 2016 under the guidance of Dr. Y. E. A. Raj, Retd. DDGM, IMD.

Nineteen research papers were published in quarterly research journal "MAUSAM", Vol. 67, No. 4 (October, 2016).

"Climate Diagnostics Bulletin of India" for August to November, 2016 was brought out.

Met. Monographs entitled "Rainwater Harvesting Potential for different locations in the state of Madhya Pradesh and Maharashtra" had been published.

"Drought Outlook Maps" for the weeks 1-7 October to 24-31 December, 2016 were prepared and uploaded on IMD, Pune Website.

Final report of Tropical Cyclone Operational Plan-21 (TCP-21), 2016, edition was provided to WMO for publication on 17th October, 2106.

An article on "Cyclone Warning Services in India" was provided to NDMA for publication released during Asian Ministerial Conference on Disaster Risk Reduction held at New Delhi during 2-5 November, 2016.

The documentary film "IMD : A Glorious Decade (2006-16)" was screened at International Science Film Festival-2016 held in New Delhi during 8-10 December, 2016.

Awards and Recognition

Indian Meteorological Society (IMS) Young Scientist Award for the best research paper published on “Tropical Meteorology” for the year 2014 was presented to **Dr. D. R. Pattanaik, Sc. ‘E’** during the opening ceremony of TROPMET-2016 in Bhubaneswar on 18th December, 2016 for the research paper authored by him and Arun Kumar entitled “**A hybrid model based on latest version of NCEP CFS coupled model for Indian monsoon rainfall forecast**” published in Atmospheric Science Letters (2014), DOI: 10.1002/asl2.513.



Dr. D. R. Pattanaik, Sc. ‘E’ receiving the award from Dr. Pradeep K. Panigrahy, Hon'ble Minister Government of Odisha

IMS Award for best paper published on “Weather and Climate Services” (Formerly Bhavanarayana Award); (2013-2014) was given to **Dr. S. D. Kotal** and his collaborators Dr. S. K. Bhattacharya and Dr. S. K. Roy Bhowmik for their paper entitled “Development of NWP Based Objective Cyclone Prediction System (CPS) for North Indian Ocean Tropical Cyclones - Evaluation of Performance” published in Tropical Cyclone Research and Review (2014), Vol. 3, 162-177. DOI 10.6057/2014TCRR03.03

Media Interaction

Shri S. B. Thampi, Scientist ‘F’ participated in the live chat show on “Vardha” Cyclone on 15th December, 2016 convened by oordarshan Kendra, Chennai.

Local forecast for 24 hrs. Regional forecast including Maximum and minimum temperature of 7 major towns of Assam and 6 States capitals of NE states supplied to DDK, Guwahati, NE-News (LocalTV news channel) Prag News etc. every day for telecast and also to local press for publication.

Visitors

Dr. S. O. Shaw, Scientist ‘E’ was invited at Kendriya Vidyalaya Borjhar as distinguished guest on the inaugural function of the Regional Children Science congress on 21st October, 2016.

Dr. M. Rajeevan, Secretary, MOES, visited IMD on 26th October, 2016 to have an on the spot assessment of Operational Cyclone Warning Services of IMD.

Dr. K. J. Ramesh, Director General of Meteorology was guest of honour on the occasion of observance of State Disaster Preparedness Day and National Day for Disaster Reduction on 29th October, 2016 at Bhubaneswar.

Dr. M. Rajeevan, Secretary, MoES visited this office on 12th December, 2016. Discussions were held on SFCs and progress of plan proposal of ‘Development of Climate Data Service Portal’.

Dr. M. Rajeevan, Secretary of MoES and Chairman ESSO, visited Met. Centre, Bhubaneswar on 19th December, 2016.

National / International Collaboration

Colloquium on Recent Developments in Prediction of Tropical Cyclone and Associated Coastal Hazards

IMD in collaboration with Indian Institute of Technology (IIT), Bhubaneswar organised a three day colloquium on “Recent Developments in Prediction of Tropical Cyclone and Associated Coastal Hazards” in the temple city Bhubaneswar during 14-16 December, 2016. Dr. M. Mohapatra, Scientist ‘G’ and LACD DGM participated in the inaugural function as a guest of honour and addressed the gathering. This colloquium featured eminent scientists from the United States and India, which provided a close working and interactive environment to work with leading scientists in the field of Tropical Cyclones and Associated hazards.

NATIONAL SYMPOSIUM ON TROPICAL METEOROLOGY



Inauguration of Tropmet – 2016

Tropmet - 2016, National symposium on Tropical Meteorology on Climate Change and Coastal vulnerability was organized by IMS in collaboration with IMD, Govt. of Odisha and SOA University during 18-21 December, 2016 at Siksha O Anusandhan University, Bhubaneswar.

Many IMD scientists delivered plenary talks, invited talks and also presented their research papers in the symposium TROPMET - 2016. Some of them are given below:

Dr. M. Mohapatra, Scientist ‘F’, delivered a plenary talk entitled “Achievements and Challenges of tropical cyclone forecast over North Indian Ocean” in the National Conference, TROPMET-2016.



Dr. D. R. Pattanaik, Scientist 'E', delivered a plenary talk entitled "Spatio-temporal perspective of Heat wave over India and its early warning", in the National Conference, TROPMET-2016.

Dr. S. L. Singh, Scientist 'F', - "Weather Dissemination -Recent initiatives & future plan of IMD".

Shri G. K. Sawaisarje, Scientist 'D' - "Relationship of pre-monsoon air temperature, soil temperature with Indian Summer Monsoon : Observational perspectives"

Dr. D. M. Rase, Meteorologist 'B' - "Impact of extreme weather events in relation to floods over Maharashtra in recent years"

Dr. P. C. S. Rao, Scientist 'E' - "Southern Hemispheric Features of Monsoon 2016" and "Rising Number of Days of Heat Wave Condition over Coastal Andhra Pradesh".

Dr. Manorama Mohanty, Scientist 'E' - "characteristics of heavy rainfall over major urban centres of Gujarat" and "Characteristics of heavy rainfall over India".

Dr. Sankar Nath, Scientist 'D' - "Analysis & Technical study of different aspects of IPSEC VPN-A revolution in Data Transfer Technology" and "The role of Communication Infrastructure on Forecasting & Warning dissemination".

Dr. R. Bibraj, Scientist 'B' - "Technical study of remote access VPN & its advantages over site to site VPN to analyze the possibility of hybrid set up at RADAR stations with evolving mobile communication Technology."

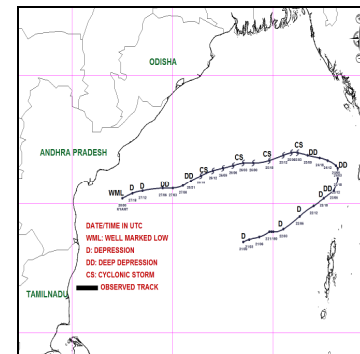
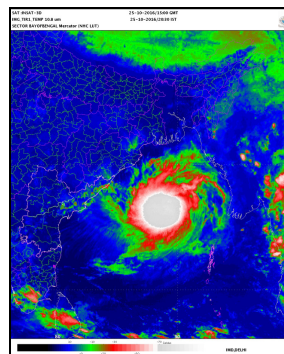
Co-operative agreement in the field of Atmospheric Environment with Finnish Meteorological Institute (FMI), Finland

A project mode cooperation agreement in the field of Atmospheric Environment was signed between FMI and IMD on 7th February, 2014. Further, implementing arrangement was signed between FMI and IMD during the Finland visit of Hon'ble President of India during 15-16, October, 2014. During last two years FMI scientists have made fifteen visits to install the air quality and climate models and provided hands on training to IMD scientists. A delegation of seven scientists from FMI visited IMD to attend the meeting during 5-6 December, 2016. The meeting chaired by Director General of Meteorology discussed the progress of scientific collaboration and future prospects of this collaboration. Considering the significant progress made under the cooperation agreement, it was decided to continue the collaboration.

Weather Summary

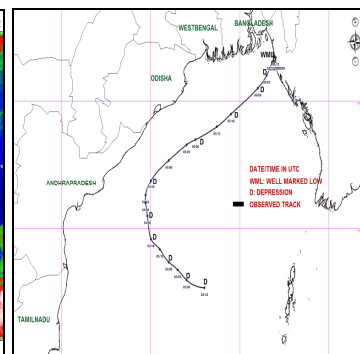
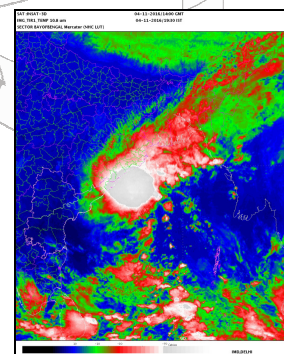
SIGNIFICANT WEATHER EVENT

Cyclonic storm, Kyant over Bay of Bengal (21-28 October, 2016)
The Cyclonic Storm (CS) Kyant developed on 21st October with



the formation of a depression (D) over eastcentral Bay of Bengal (BOB). Initially, it moved east-northeastwards towards Myanmar coast and steadily intensified into a deep depression (DD) on 23rd morning. Thereafter, it changed its direction of movement and recurved west-northwestwards. It intensified into a CS in the morning of 25th over eastcentral BOB. Thereafter, it again changed its direction of movement and moved west-southwestwards towards westcentral BOB off Andhra Pradesh coast. It maintained its intensity till midnight of 26th and thereafter weakened gradually becoming DD in the early hours 27th and D in the same evening. It weakened into a well marked low pressure area over westcentral BOB off Andhra Pradesh coast in the morning of 28th. The track followed by the system was rare in nature as it experienced two recurvatures during its life period. The recurvature was anticlockwise against the normal clockwise recurvature over the BOB. The last such re-curvature over the BOB occurred in case of VSCS Madi (December, 2013). It was one of the longest track in recent years with life period of 7 days. Though the system was moving towards Myanmar, no landfall over Myanmar was predicted by IMD. No Cyclone Alert/Warning was issued for any coastal state of India.

DEPRESSION OVER BAY OF BENGAL (BOB) (2-6 NOV., 2016)



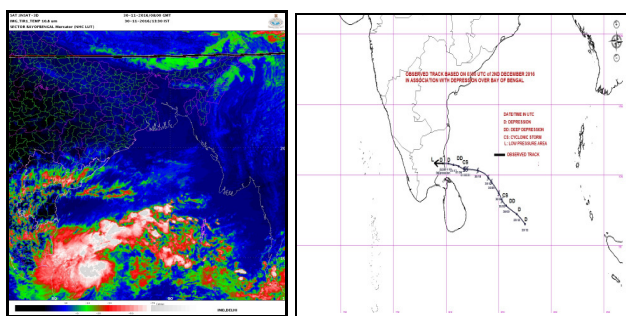
A depression formed over southeast Bay of Bengal (BOB) in the midnight of 2nd November. It moved initially west-northwestwards and then northwestwards to westcentral BOB till evening of 4th November. Thereafter, it recurved east-northeastwards and reached southeast Bangladesh coast close to Kutubdia in the afternoon of 6th. It weakened into a well marked low pressure area over southeast Bangladesh and adjoining northeast BOB in the evening of 6th. The track of the system and typical satellite imagery is presented in figure. It



was second consecutive recurving system in the post-monsoon season (October-December, 2016) after cyclonic storm (CS) 'Kyant'. While CS 'Kyant' had anticlockwise re-curved, this depression had clockwise re-curved.

Though the system was moving towards east coast of India till 4th midnight, no Cyclone Warning/Alert was issued for any coastal state of India due to accurate prediction of its track towards Bangladesh. The movement of system towards Bangladesh coast was predicted well in advance from the first Bulletin (84 hours in advance of reaching Bangladesh coast). Rainfall over the coastal states was well predicted by IMD since first bulletin.

CYCLONIC STORM "NADA" OVER BAY OF BENGAL (BOB) (29 NOVEMBER-2 DECEMBER 2016)



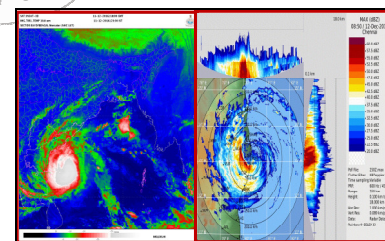
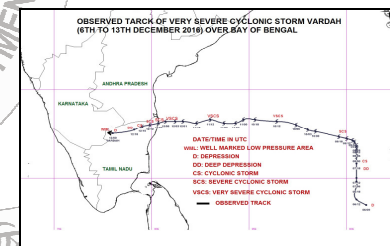
A depression formed over southeast BOB in the evening of 29th November. It moved initially northwestwards and intensified gradually into cyclonic storm (CS) "Nada" over southeast BoB in the morning of 30th. It maintained its intensity till the evening of 1st December while moving west-northwestwards. It weakened into a deep depression (DD) in the noon of 1st December and further into a depression in the same midnight. Continuing to move west-northwestwards, it crossed north Tamil Nadu coast near Nagapattinam (about 20 km south of Karaikal) during 0400-0500 hours IST of 2nd December. Continuing to move westwards, it further weakened into a well marked low pressure area over interior Tamil Nadu in the forenoon of 2nd December, 2016. It was the second CS over BOB during post monsoon season. Like Kyant, it also weakened over sea under the influence of high vertical wind shear, low sea surface temperature and low ocean heat content over southwest BoB off Tamilnadu coast. Genesis of depression over southeast BOB was predicted 72 hours in advance (26th November). The landfall over north Tamil Nadu coast was predicted from the genesis stage itself, i.e., in the evening of 29th December, 2016 (about 60 hrs in advance). The weakening of the cyclonic storm into a depression at the time of landfall was predicted 24 hrs in advance of time of landfall. The realised rainfall at most places with isolated heavy to very heavy rainfall over Tamil Nadu and Puducherry on 1st was also well predicted in the first bulletin itself issued on 29th evening.

VERY SEVERE CYCLONIC STORM "VARDHAH" OVER BAY OF BENGAL (6-13 DECEMBER, 2016)

A depression (D) developed over southeast Bay of Bengal (BOB) in the afternoon of 6th December. Moving

northwestwards initially and northwards thereafter, it intensified into a deep depression (DD) in the midnight of 7th December, into a cyclonic storm (CS) "VARDHAH" in the morning of 8th and into a severe cyclonic storm (SCS) in the midnight of 9th. It then moved west-northwestwards and intensified further into a very severe cyclonic storm (VSCS) over westcentral and adjoining south BOB in the evening of 10th December. It then moved nearly westwards and reached its peak intensity of about 130 kmph on 11th December evening and maintained the same intensity till noon of 12th December. It weakened into an SCS and crossed north Tamil Nadu coast near Chennai during 1500-1700 hrs IST of 12th December, 2016 with a wind speed of 100-110 kmph gusting to 120 kmph. After the landfall, the SCS moved west-southwestwards and weakened into a CS in the evening, into a DD in the midnight of 12th and into D in the early morning of 13th. Continuing its west-southwestwards movement, it weakened into a well marked low pressure area in the forenoon of 13th December.

Salient features : It was the first very severe cyclonic storm of the year 2016. Vardah was the fourth consecutive cyclone with recurring track after cyclones Roanu, Kyant and Nada during the year, as it changed its track from initial northwards movement to west-northwestwards and then west-southwestwards after landfall. It was also third consecutive cyclone during the year after cyclones Kyant and Nada to exhibit weakening trend before landfall. However, unlike the previous two cyclones in the season, it crossed the coast with the cyclone intensity. The peak maximum sustained wind



speed of the cyclone was 130 kmph gusting to 145 kmph over westcentral BOB. However, the system weakened over westcentral and adjoining southwest BOB before landfall and the wind speed at the time of landfall was 100-110 kmph gusting to 120 kmph. The life period of cyclone was 159 hours (6.6 days) against the normal of 4.7 days over north Indian Ocean during post monsoon season for VSCS category. The track length of the cyclone was 1795 km. The 12 hour average translational speed of the cyclone was 5.2 kmph against normal of 13 kmph over BOB for post-monsoon season. However, prior to landfall, the cyclone moved with a speed of about 15-20 kmph.