

Ministry of Earth Sciences (MoES)
Govt. of India
Summary of Important Developments – March, 2023

1. Important policy decisions taken and major achievements during the month:

Provided in Annex-I.

2. Important policy matters held up on account of prolonged Inter-Ministerial consultations:

Nil

3. No. of cases of 'sanction for prosecution' pending for more than three months:

Nil

4. Particulars of cases in which there has been a departure from the Transaction of Business Rules or established policy of the Government:

Nil

5. Status of ongoing Swachhta Abhiyan (progress under Special Campaign):

Routine cleaning of the campus.

6. Status of Rationalization of Autonomous Bodies:

The Cabinet in its meeting on 13th July 2022 approved the merging of 5 Autonomous Bodies under MoES to one Autonomous Body.

7. Information on specific steps taken for utilization of the Space Technology based tools and applications in Governance and Development:

Potential Fishing Zone advisories are generated using the satellite derived parameters viz., Sea Surface Temperature, and Chlorophyll. Further, data

from Global satellite data are used on continuous basis for generating short range and medium range weather forecasts.

8. Vacancy position of senior level appointments in the Ministry/ Department, including Autonomous Bodies/ PSUs:

It is confirmed that the incumbency details of all the posts in the Ministry/Department and its organizations falling under the purview of the ACC have been updated on AVMS and are placed at Annex-II.

9. List of cases in which ACC (Appointments Committee of Cabinet) directions have not been compiled with:

It is confirmed that the directions of ACC are complied with.

10.Details of FDI Proposals cleared during the month and status of FDI proposals awaiting approval in the Ministry/ Department:

Not Applicable.

Important policy decision taken and major achievements:

- Desalination plants at Kalpeni and Amini islands of UT of Lakshadweep setup by MoES - National Institute of Ocean Technology (NIOT) were digitally Inaugurated by Honorable President of India Smt. Droupadi Murmu on 18th March 2023 in presence of Honorable Administrator, UT Lakshadweep.
- After completion of scientific work and logistics operations at Indian Antarctic station Bharati, the Antarctic expedition vessel sailed for Indian Barrier off-Maitri station on 5th March 2023.
- Ministry of Earth Sciences (MoES), Ministry of Science and Technology, Department of Bio-Technology and Council of Scientific & Industrial Research (CSIR) jointly organized Vigyan Chintan Shivir during 3-4 March 2023 at New Delhi. The event was marked by presence of Hon'ble Union Minister of State (Independent Charge) Earth Sciences Dr. Jitendra Singh and Secretaries and scientists from all the departments.
- India Meteorological Department (IMD) & Nigerian Meteorological Agency (NiMet), Nigeria signed a Memorandum of Understanding (MoU) on 2nd March 2023 for collaboration in the conduct of Scientific & Technical Research and the development of practical skills that benefit the International Community.
- IMD and Indian Meteorological Society (IMS) jointly celebrated World Meteorological Day on 23rd March, 2023 addressing the theme "The future of weather, climate and water across generations". On this occasion, following publications were released:
 - Special Issue of MAUSAM (Vol. 74, No 2, 2023) containing the proceedings of 7th WMO International Workshop on Monsoon (IWM-7)
 - IMD Met Monograph: Northeast Monsoon of South Asia
 - IMD Annual Report 2022
- IMD signed Letter of Agreements with Green Alerts Web Portal and Wingify foundation to provide weather forecast and farm based weather advisories to farmers.

There was no matter pending before the Cabinet requiring decision/approval.

Minimum Government, Maximum Governance:

- Dissemination of Agromet Advisories to user communities through SMS and IVR technology is continued in the country through Kisan Portal and under PPP (Public Private Partnership) mode. Presently, about 7.6 million farmers in the country are getting advisories directly.
- Adverse-weather SMS warnings are being sent through mobile to the State Government officials / Disaster-related officials / Central Government organizations/common man.
- Daily forecast along with warning and city forecast for many cities are disseminated through email to all users including state authorities, electronic and print media.

Atmospheric Observation Systems Network

Observation Type	Commissioned so far	Installations during the month	Data Reporting
Automatic Weather Station (AWS)	*481	--	481
Automatic Rain Gauge (ARG)	**484	--	484
Agro AWS	200	--	197
GPS Sonde based RS/RWStns.	56	--	56
Doppler Weather Radar (DWR)	***37	--	28
Ozone (Ozone Sonde + Total Ozone)	02	--	02
Surface Ozone (Electrochemical Concentration Cell method)	07	--	05
Nephelometer	12	--	09
Sky Radiometer	20	--	16
Black Carbon Monitoring Systems (Aethalometer)	25	--	19
Air Quality Monitoring System (SAFAR)	10 (Delhi) 10 (Mumbai) 10 (Ahmedabad)	--	09 (Delhi) ****NIL (Mumbai) NIL (Ahmedabad)
Hydromet. (IMD &	---	--	3115

Observation Type	Commissioned so far	Installations during the month	Data Reporting
Extra-departmental excluding AWS & ARG)			
Aviation	94	--	94
Radiation Stations	47	---	47

* Out of Total 808 commissioned, 327 are outlived.

** Out of total 1382 commissioned, 898 are outlived.

*** Including 2 Doppler Weather Radar of Indian Space Research Organization (ISRO).

**** Contract with the firm is not renewed.

Modelling

During March 2023, every week on Thursdays, National Centre for Medium Range Weather Forecasting (NCMRWF) coupled model based Extended Range Prediction (ERP) for four weeks for rainfall, surface temperature and winds (full fields and anomalies) were provided in real-time to (i) Long-range forecast and Agri-Met divisions of IMD, (ii) Indian Institute of Tropical Meteorology (IITM) ERP group, (iii) Space Applications Centre (SAC), (iv) Defence Geo-informatics Research Establishment (DGRE), (v) Indian Air Force (IAF), (vi) Navy, (vii) Geological Survey of India (GSI), (viii) National Institute of Hydrology (NIH), (ix) All regional centres of IMD and (x) Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) countries Met Departments. Additionally, snow forecasts were provided to Defence Research and Development Organisation (DRDO) and IAF for use at their end. On the last Thursday of the month, i.e., on 30th March 2023 the monthly mean forecast valid for April 2023 were also included for the users.

Monthly Weather Summary (March 2023)

a) Important Weather Events during the month

Western Disturbances:

Seven Western Disturbances and six induced cyclonic circulations had affected Northwest and adjoining areas of West and Central India during the month and had caused normal to above normal rainfall activity over most part of the country during

the month; during the second half of the month, most parts of the country experienced severe thunderstorm (TS) activities occurring simultaneously across the country along with isolated hailstorms, lightning and gusty winds.

b) Rainfall Scenario:

The rainfall for the country as a whole, for the month of March-2023 has been recorded as 37.6 mm which is 126% of its Long Period Average (LPA) of 29.9 mm.

c) Heavy Rainfall Events:

Warning issued for	No. of Heavy/Very Heavy Rainfall Events (>64.4 mm): 330
	Percentage correct (in %) for Rainfall >64.4mm
Day1 / 24 Hours	94
Day2 / 48 Hours	94
Day3 / 72 Hours	94

d) Temperature Scenario:

The mean temperature for the month of March-2023 for the country as a whole was 25.43°C which was above normal by +0.37°C. The maximum temperature of 40.2°C had been recorded at Karwar (Coastal Karnataka) on 4th March 2023 and over Wardha & Brahmapuri (Vidarbha) on 30th March 2023 and the minimum temperature of 9.7°C had been recorded at Aurangabad (Marathwada) on 8th March 2023 over the plains of the country during the month.

e) Thunder Squall & Hailstorm activity:

Thunder squall & Hailstorm activity during the month (till 0830 IST of last date of the month) is given in the table below:

S. No.	Region	Thunder Storm Days	Hail Events	Squall Events	Dust storms
1.	South Peninsular India	13	1 {Bidar city-19 Mar}	Nil	Nil
2.	Northwest India	31	20 { Shimla (7,8,16,19,20,21 Mar),	Nil	1 {Sriganga

S. No.	Region	Thunder Storm Days	Hail Events	Squall Events	Dust storms
			Tehri-14 Mar, Batote-16 Mar, Ludhiana-16 Mar, Kanpur-30 Mar, Barabanki-21 Mar, Lucknow-21 Mar, Hardoi-21 Mar, Fursatganj-21 Mar, Palampur-22 Mar, Sirganganagar-24 Mar, Jammu-25 Mar, Bilaspur,25 Mar, Bhaderwah-26 Mar, Sama-26 Mar))		nagar- 16 Mar}
3.	Northeast India	18	4 {Shillong -15 Mar, Cherrapunjee- 16 Mar, Dibrugarh- 27 Mar, Lengpui- 27 Mar}	2 {Dibrugarh- 27 Mar, Barapani- 28 Mar}	Nil
4.	East India	27	9 {Gangtok-15,22 Mar, Darjeeling-11 Mar, Tadong-15 Mar, Coochbehar-15 Mar, Jalpaiguri-15 Mar, Haldia-16 Mar, Bankura-16 mar, Sriniketan-16 Mar}	4 {Alipore-16,30 Mar, Dumdum-16,20 Mar}	Nil
5.	Central India	26	Nil	1 {Satna-30 Mar}	Nil
6.	West India	21	5 {Deesa- 6 Mar, Nasik-6 Mar, Dhule- 6 Mar, Ahmednagar-18 Mar, Parbhani-18 Mar}	1 { Baroda- 6 Mar}	Nil

Bulletins/Warnings/Press Releases Issued:

All India Weather Bulletins:- 124, All India inference and severe weather warnings:- 124, All India Weekly Weather Reports:- 5, Daily Tropical Weather Outlook with cyclogenesis forecast for next 5 days: 31, Daily Severe Weather Guidance for next 5 days under Severe Weather Forecasting Programme: 31, Weekly Extended Range Outlook for Cyclogenesis for next 2 weeks: 5, Daily Warnings for Fishermen in North Indian Ocean for next 5 days: 31, Fleet Forecast for Indian Navy for next 12 hours: 62, Bulletins for ships in deep sea under Global Maritime Distress Safety System for next 36 hours: 62, Mountain weather bulletins issued for western and central

Himalayan region:- 62, Nowcast Guidance Bulletins for Severe Weather:- 31, Forecast Demonstration Project (FDP) Severe Thunder Storm Observation and Regional Modeling (STORM) Bulletins: 31, Heat wave Bulletins:-31, Press Releases issued during the month:- 36.

Publications & Operational Reports:

1. ENSO bulletin for the month of March 2023 and Seasonal Climate Outlook for South Asia for the period of March to June 2023 were issued.
(Quick Link :www.imdpune.gov.in/Clim_Pred_LRF_New/Products.html)
2. Impact Based Forecast (IBF) for Agriculture for minimizing the production losses in agriculture. Impact of high temperatures on wheat growth and yield over north-west India.
3. Present Weather Detector (PWD) system was installed at Runway (RWY) 27, Deoghar airport, at Hiraser airport, Rajkot and Diu airport at RWY 28, Gaya airport and at RWY 26 Hubli Airport.
4. Digital Current Weather Indication System (DCWIS) and PWD system were installed at RWY 05, Ahmedabad airport and at RWY 04 Tezu.
5. One AWS installed at Gangtok, Sikkim.

Seismological Observational Network:

Observation Type	Commissioned so far	Data reporting during the month
Seismic stations	152	137

Earthquake and Tsunami monitoring

Earthquake:

164 earthquakes were monitored in the Indian region out of which 6 events were greater than the magnitude (M) of 5.0.

Tsunami:

3 seabed earthquakes (M>6) with a potential to generate tsunami have occurred during the month. These information were provided in less than 12 minutes of occurrence of the events.

Ocean Observation System

Type of Platform	Commissioned till	Data received during
------------------	-------------------	----------------------

	during the month	the month
Argo Floats	80	50
Moored Buoys	19	12
Tide Gauges	36	33
High Frequency (HF) Radars	12	6
Acoustic Doppler Current Profiler (ADCP)	20	17
Tsunami Buoys	7	4
Wave Rider Buoy	18	12

Ocean Science Services

S. No.	Types of forecasts	No. of advisories issued during the month
1.	Integrated Potential Fishing Zone (PFZ) advisories (Sea Surface Temperature (SST), Chlorophyll., wind)	28
2.	Tuna Fishing Advisories	25
3.	Ocean State Forecast (OSF)-Wave, Wind, Currents, SST (Sea Surface Temperature), MLD (Mixed Layer Depth) and D20 forecasts	28
4.	Real time global ocean analysis (daily)	28
5.	Coral Bleaching Alert System	9

Outreach and Awareness

- Weather and Climate Science for Service Partnership India (WCSSP-India) Annual Science Workshop was held at NCMRWF from 27th February 2023 to 3rd March 2023.
- Students from the various colleges/ institutes/ universities visited IITM, INCOIS, NCMRWF and CMLRE.
- IMD, NIOT, NCMRWF and INCOIS celebrated the International Women's Day 2023 during March 2023.
- IITM and NCMRWF celebrated World Meteorological Day 2023 on 23rd March 2023.
- International Training Centre for Operational Oceanography (ITCOO) conducted a training program on "Ocean Observation System, Operational Services and Ocean Data Utilisation" for students of Indian Institutes of

Technology (IIT) Bhubaneswar and the University of Hyderabad On 9th & 10th March 2023.

- INCOIS scientist in collaboration with M S Swaminathan Research Foundation conducted district level awareness workshops on INCOIS Services at Poompuhar, Mayiladuthurai district and Keezhakarai, Ramanathapuram district of Tamil Nadu on 14th & 16th March 2023 respectively.
- On 26th February 2023, INCOIS hosted officials from Tamil Nadu State Disaster Management Authority. In-depth interaction on multi-hazard vulnerability and tsunami early warning that caters to Indian Ocean region countries under the Intergovernmental Oceanographic Commission (IOC) of United Nations Educational, Scientific and Cultural Organization (UNESCO) framework was held.
- The Partnership for Observation of the Global Ocean (POGO) and Shahjalal University of Science and Technology (SUST), Sylhet, Bangladesh jointly organized 'Regional Training Programme on Sustainable Marine Resource Management' during 12-23 Mar 2023. A total of 22 participants were from various universities and organizations of Bangladesh, India, Malaysia and Philippines participated.
- INCOIS generated oil spill trajectory pattern for the spill reported due to pipeline rupture at Nagore Beach, Nagapattinam on 2nd March 2023 and provided oil spill pattern advices to MS Swaminathan Research Foundation and local community.
- IITM organized Workshop on the role of Women in Weather and Climate Sciences (W3CS) on 15th March 2023 in Hybrid mode.
- "Annual Monsoon Workshop (AMW-2022)" and National Symposium on "Challenges in climate services for health sector in the warming environment", was organised by IITM and IMD at IITM during 28-30 March 2023.
- Three days training programme on open sea cage culture was organized at Andaman Nicobar Center for Ocean Science and Technology (ANCOST), Port Blair, jointly with Department of Fisheries Andaman Nicobar. 25 fishermen participated in the training.
- IMD issued daily weather forecasting video of about 5 minutes duration in English & Hindi through YouTube, Facebook, Twitter and IMD website.

- Weekly video on extended range forecast (upto two weeks) were issued every Thursday through website and social media (Facebook, Twitter, YouTube etc.).
- Daily interviewed was provided by the forecasters within the country.
- The forecast videos in regional language were issued by regional offices of IMD regularly.
- Bulletins and Warnings along with graphics were also communicated through Social Media including Facebook, Twitter, Instagram, YouTube and IMD Blog page.
- MoES is participating in the G20 events.

Publications

Subject	Publications			Ph.Ds		
	April 22 – Feb 2023	Mar 23	Total	April 22 – Feb 2023	Mar 23	Total
Atmospheric Sciences	181	11	192	22	-	22
Ocean Science and Technology	80	9	89	6	1	7
Polar Sciences	25	4	29	-	1	1
Geosciences and resources	60	6	66	1	-	1
Total	346	30	376	29	2	31

Utilization of Ocean Research Vessels during the month

Vessel	Days at Sea/ Utilization	Maintenance/ Inspection/Scientific Logistics/ Cruise Preparation	No. of Cruise
Sagar Nidhi	26	5	2
Sagar Manjusha	26	5	2
Sagar Tara	9	22	1
Sagar Anveshika	2	29	1
Sagar Kanya	0	31	0
Sagar Sampada	0	31	0

MoES/20/01/2017-Estt.

I/4979/2023

No.MoES/20/01/2017-Estt.
Government of India
Ministry of Earth Sciences

Prithvi Bhavan, Lodhi Road
New Delhi-110 003
Dated, the 06 April, 2023

**CERTIFICATE
(FOR THE MONTH OF MARCH, 2023)**

It is certified that the detailed status regarding all the posts pertaining to Ministry of Earth Sciences have been updated on AVMS as on last day of the month of March, 2023. A summary of the status is given below:-

- | | |
|--|------|
| a. The total number of posts required to be entered on AVMS | - 13 |
| b. Number of posts filled as on date | - 12 |
| c. Number of posts totally vacant as on date | - 01 |
| d. Number of posts under additional charge arrangement | - 00 |
| e. Number of posts that would fall vacant during the next 6 months | - 00 |



(Dharkat R Luikang)
Deputy Secretary
dharkat@nic.in