

Ministry of Earth Sciences (MoES)
Govt. of India
Summary of Important Developments – March, 2024

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):

As a part of Special Campaign 3.0, various activities were carried out under Swachhta Abhiyan during the month of February 2024 in MoES and its institutes.

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. An umbrella Autonomous Society 'Earth System Science Council (ESSC)' has been registered in the office of the Registrar of Societies under Govt of NCT of Delhi along with Memorandum of Association and Rules and Regulations of ESSC on 26th December 2023.

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 Appointments Committee of Cabinet (ACC) have been updated on ACC Vacancy Monitoring System (AVMS) and are placed at Annex-II.

9. List of cases in which ACC directions have not been compiled with:

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

10. Details of Foreign Direct Investment (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:

- The Coastal Research Laboratory (CRL) of National Centre for Coastal Research (NCCR) at Dolphins Nose, Visakhapatnam, was inaugurated by the Hon'ble union Minister of Earth Sciences (HMoES) on 12th March 2024.
- The HMoES inaugurated the "Atmospheric Research Testbed (ART) Facility" of Indian Institute of Tropical Meteorology (IITM) at Silkhedra, Bhopal, Madhya Pradesh on 12th March 2024.
- The foundation stone laying ceremony of the marine fish rearing facility at Atal Center for Ocean Science and Technology for Islands (ACOSTI) of National Institute of Ocean Technology (NIOT) was performed by the HMoES.
- The HMoES inaugurated the Selfie Point at IMD's Main Gate on 5th March, 2024.
- Ministry of Earth Sciences (MoES) organised a consultative workshop on the Blue Economy Pathways study report status. Experts from the World Bank, various line Ministries like the Ministry of Statistics and Programme Implementation, Ministry of Environment, Forest & Climate Change, Ministry of Fisheries, Animal Husbandry and Dairying, Niti Aayog, Ministry of Port Shipping and Waterways, Ministry of Tourism and various state and national R&D organisations participated to deliberate on the collaborative role of each line Ministry towards the preparation of the report.
- India Meteorological Department (IMD) released the Monthly Outlook for Temperature and Rainfall on 1st March, 2024. The highlights of the Outlook are as below:
 1. During the upcoming hot weather season (March to May (MAM)), above-normal maximum temperatures are most likely over most parts of the country.
 2. The rainfall during March 2024 averaged over the country as whole is above normal (>117% of LPA).
- Indigenously developed Underwater Acoustic Telephone (UAT) for inter-personal communication between surface ship and deep-water manned submersible has been designed, developed and demonstrated successfully at sea up to 500m depth by NIOT.

- India Meteorological Department celebrated World Meteorological Organisation (WMO) Day on the theme of 'On the Frontline of Climate Actions' at Mahika Hall, Ministry of Earth Science on 22nd March 2024.
- IMD signed a MoU with the Government of Uttar Pradesh on 8th March 2024 for enhancement of observational network in Uttar Pradesh.
- An MoU between Reserve Bank of India (RBI) and IMD was signed to share weather and climate information with RBI to enhance cooperation between the two agencies with respect to planning of various economic activities in the country.
- National Centre for Medium Range Weather Forecasting (NCMRWF) and Cochin University of Science and Technology (CUSAT) entered into an MoU for scientific collaboration.
- Indian National Centre for Ocean Information Services (INCOIS) hosted officials from the US Consulate, Hyderabad on 29 February 2024.
- MoES team presented to ISA for seeking two new areas (PMS and Cobalt crust) for exploration rights at ISA, Kingston, Jamaica.

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)	*549	--	549
Automatic Rain Gauge (ARG)	**527	--	527
Agro AWS	200	--	188
Global Positioning System (GPS) Sonde based Radio-Sonde (RS)/ Radio-Wind (RW) stations	56	--	56
Doppler Weather Radar (DWR)	***41	--	33
Ozone (Ozone Sonde + Total Ozone)	02	--	02
Surface Ozone (Electrochemical Concentration Cell method)	09	--	06
Nephelometer	12	--	09
Sky Radiometer	20	--	13
Black Carbon Monitoring Systems (Aethalometer)	25	--	23
Air Quality Monitoring System (System of Air Quality and Weather Forecasting and Research (SAFAR))	10 (Delhi) 10 (Mumbai) 10 (Ahmedabad)	--	09 (Delhi) ****NIL (Mumbai) NIL (Ahmedabad)
Hydromet. (India Meteorological Department (IMD) & Extra-departmental excluding AWS & ARG)	---	--	4924
Aviation	101	--	101
Radiation Stations	47	---	47

* Out of Total 808 commissioned, 259 are outlived.

** Out of total 1382 commissioned, 855 are outlived.

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

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

Modelling

During March 2024, 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 centers 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 28th March 2024 the monthly mean forecast valid for April 2024 were also included for the users.

Monthly Weather Summary (March 2024)

a) Important Weather Events during the month

Western Disturbances (WDs):

A total of 7 number of WDs (during 1-3, 5-9, 9-13, 12-15, 18-21, 20-23 and 25-31 March) caused Rain/ Snow over Western Himalayan states and adjoining plains of northwest India for 1-3 days. Out of 7 WDs, 5 WDs were active and caused rain/ Thunder Storm (TS) and hail storm over plains of north and central India.

Heat Wave and Hot Day Scenario:

Due to mainly dry weather prevailed over peninsular India and adjoining west central India during most days in the last week of the month, maximum temperatures were raised in some areas of these regions, leading to development of Season's 1st heat wave conditions. It was observed at isolated pockets over Madhya Pradesh on 28th & 29 March and West Rajasthan on 29th March.

East-West Trough:

East-west trough from Bihar to South Assam and lower-level winds with moisture incursions emanating from anti-cyclone over central and north Bay of Bengal caused wet spells over east and northeast India at regular intervals of 3-5 days.

b) Rainfall Scenario:

The rainfall for the country as a whole, for the month of March-2024 has been recorded as 28.5 mm which is 95% 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): 306
	Percentage correct (in %) for Rainfall >64.4mm
Day1 / 24 Hours	96
Day2 / 48 Hours	96
Day3 / 72 Hours	96

d) Temperature Scenario:

The mean temperature for the month of March-2024 for the country as a whole was 24.92°C which was above normal by 0.21°C. The maximum temperature of 42.8°C had been recorded at Akola (Vidarbha) on 27th March 2024 and the minimum temperature of 5.0°C had been recorded at Pilani (East Rajasthan) on 4th March 2024 and at Karnal (Haryana) on 6th March 2024 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	10	Nil	Nil	Nil
2.	Northwest India	21	5 (1,2,3,19,30 March)	Nil	Nil
3.	Northeast India	9	Nil	Nil	Nil

S. No.	Region	Thunder Storm Days	Hail Events	Squall Events	Dust storms
4.	East India	19	3 (21,25,31 March)	4 (13,15,25,31 March)	Nil
5.	Central India	16	3 (17,18, 19 March)	Nil	Nil
6.	West India	5	1 (16 March)	Nil	Nil

Bulletins/Warnings/Press Releases Issued:

All India Weather Bulletins: 124, All India inference and severe weather warnings: 124, All India Weekly Weather Reports: 4, Daily Tropical Weather Outlook with cyclogenesis forecast for next 5 days: 31, Weekly Extended Range Outlook for Cyclogenesis for next 2 weeks: 4, Daily Warnings for Fishermen in North Indian Ocean for next 5 days including the advisories from sub-offices of IMD (6 hourly): 124, Fleet Forecast for Indian Navy for next 12 hours: 62, Bulletins for ships in deep sea under Global Maritime Distress Safety System (GMDSS) for next 36 hours: 62, Severe Weather Advisory Bulletins for nowcast guidance: 31, FDP STORM Bulletins: 31, Mountain weather bulletins issued for western and central Himalayan region: 62, All India Multi-hazard winter weather warnings bulletin issued for North India: 31, Current Temperature Status and Warning bulletins: 31, Press Releases issued during the month: 46.

Publications & Operational Reports:

1. El Nino Southern Oscillation (ENSO) bulletin for the month of March 2024 and Seasonal Climate Outlook for South Asia for the period of March to June 2024 were issued. (QuickLink: https://imdpune.gov.in/cmpg/Product/ENSO_Bulletin/ENSO_IOD_Update_Bulletin_03_24.pdf)
2. Climate Summary for the month of February-2024 was issued.
3. Climate Diagnostic Bulletin for December 2023 and Post monsoon 2024 has been published and uploaded on the website
4. PWD system was installed at Kadapa airport (RWY 11) from 4th to 8th March, 2024. The wind sensor at the ATC tower was also replaced with an Ultrasonic wind sensor and made serviceable.

Seismological Observational Network:

Observation Type	Commissioned so far	Data reporting during the month
Seismic stations	157	131

Earthquake and Tsunami monitoring

Earthquake:

188 earthquakes were monitored in the Indian region out of which 43 events were greater than the magnitude (M) of 5.0.

Tsunami:

1 seabed earthquakes (M>6) with a potential to generate tsunami has occurred during the month.

Ocean Observation System

Type of Platform	Commissioned till during the month	Data received during the month
Argo Floats	115	72
Moored Buoys	19	15
Tide Gauges	36	34
High Frequency (HF) Radars	10	8
Acoustic Doppler Current Profiler (ADCP)	20	17
Tsunami Buoys	7	5
Wave Rider Buoy	16	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)	29
2.	Tuna Fishing Advisories	11
3.	Ocean State Forecast (OSF)-Wave, Wind, Currents, SST (Sea Surface Temperature), MLD (Mixed Layer Depth) and D20 forecasts	29
4.	Real time global ocean analysis (daily)	29
5.	Coral Bleaching Alert System	10

Outreach and Awareness

- A training was organized on 19th March 2024 at Bhubaneswar, Odisha on the Tsunami Ready Recognition Programme (TRRP), a joint initiative by INCOIS (MoES), Hyderabad and Odisha State Disaster Management Authority (OSDMA), accredited by United Nations Educational, Scientific and Cultural Organization (UNESCO) to prepare 24 additional villages for UNESCO TRRP.
- INCOIS issued the followings:
 - One hundred and fifty-four (154) High wave/ Swell Surge Alert/ Rough Sea Alert were issued to West and East Coast of India, Andaman & Nicobar Islands.
 - Twenty-nine (29) days forecasts were issued to Regional Specialized Meteorological Centre (RSMC) for (i) Numerical Ocean Wave Prediction (wave and swells) and (ii) Global Numerical Ocean Prediction (currents, conservative temperature & absolute salinity) for the Indian Ocean.
 - Provided weekly updates, including past week briefing and upcoming week forecast of Ocean State Forecast information (Wave, Wind, Current, Swell, Sea Surface Temperature) for Indian Ocean to South Asia Hydromet Forum (SAHF).
 - Twenty-seven (27) days Algal Bloom Information Service was issued, and two (2) days alert was generated.
 - In the INCOIS website, there is an option to register and use the online applications for forecast along the shipping route and Search and Rescue Aid Tool (SARAT) advisories. This month registered users for Forecast along the ship route- One (1) and SARAT services- seven (7).
- Students from various colleges/ institutes/ universities/ schools visited Indian National Centre for Ocean Information Services (INCOIS) and IITM.
- Officers from the Indian Navy visited NCMRWF on 04-05 March 2024 for a Familiarization Course on Numerical Weather Prediction.
- MoES and its institutes celebrated the International Women's Day.
- 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.).
- The forecast videos in regional language were issued by regional offices of IMD regularly.
- Daily interviews were provided by the forecasters within the country.
- Bulletins and Warnings along with graphics were also communicated through social media including Facebook, Twitter, Instagram, YouTube and IMD Blog page.

Publications

Subject	Publications			Ph.Ds.		
	Apr 2023 – Feb 2024	Mar 2024	Total	Apr 2023 – Feb 2024	Mar 2024	Total
Atmospheric Sciences	153	13	166	12	0	12
Ocean Science and Technology	97	9	106	4	0	4
Polar Sciences	28	4	32	1	0	1
Geosciences and resources	56	8	64	5	1	6
Total	334	34	368	22	1	23

Utilization of Ocean Research Vessels during the month

Vessel	Days at Sea/ Utilization	Maintenance/ Inspection/ Scientific Logistics/ Cruise Preparation	No. of Cruises
Sagar Nidhi	26	5	2
Sagar Manjusha	12	19	2
Sagar Tara	21	10	1
Sagar Anveshika	0	31	0
Sagar Kanya	0	31	0
Sagar Sampada	25	6	2

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Ministry of Earth Sciences

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**CERTIFICATE
(FOR THE MONTH OF MARCH, 2024)**

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, 2024. 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	-	02


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