

Ministry of Earth Sciences (MoES)
Govt. of India
Summary of Important Developments – April, 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 April 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:

- During the 2024, hot weather season (April to June (AMJ)), above-normal maximum temperatures are likely over most parts of the country, except some parts of east and northeast India and pockets of northwest India where normal to below-normal maximum temperatures are likely.
- The air quality in Delhi remained in the Moderate category for 23 days in April 2024.
- India Meteorological Department released Long-Range Forecast for southwest monsoon 2024 on 15th April 2024. The highlights of the Press Release are:
 - a. The 2024 southwest monsoon seasonal (June to September) rainfall over the country as a whole is most likely to be above normal (>104% of the Long Period Average (LPA)).
 - b. Currently, moderate El Niño conditions are prevailing over the equatorial Pacific region. The El Niño condition is likely to weaken further to neutral El Niño Southern Oscillation (ENSO) conditions during early part of the monsoon season and La Niña conditions are likely to develop during second half of monsoon season.
 - c. At present, neutral Indian Ocean Dipole (IOD) conditions are prevailing over the Indian Ocean and the positive IOD conditions are likely to develop during the later part of the southwest monsoon season.
 - d. The northern hemisphere snow cover extent during the last three months (January to March, 2024) was below normal. Winter and spring snow cover extent over Northern Hemisphere as well as Eurasia has a generally inverse relationship with the subsequent Indian summer monsoon rainfall.
- Indian Institute of Tropical Meteorology (IITM) developed the First version of IITM-Decadal Climate Prediction System (DCPS) and is being used by World Meteorological Organization (WMO) Lead Center for preparing the “Global Annual to Decadal Climate Update”.

- IMD organized Pre-Cyclone Exercise Meeting on 10th April 2024 in which about 230 participants from different organizations including central level disaster management agencies, state level disaster management agencies, various Ministries & Departments, IMD's sister organizations and research institutes participated.
- A MoU with New Space India Limited (NSIL), Bangalore, for 8 MHz transponder capacity to establish 24x7 satellite connectivity with Maitri station, Antarctica, was extended until December 2024 by National Centre for Polar and Ocean Research (NCPOR), Goa.
- IMD signed an MoU with Onamet, Dominican Republic on 23rd April 2024 for joint research and development of weather and climate services.

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)	*604	--	604
Automatic Rain Gauge (ARG)	**550	--	550

Observation Type	Commissioned so far	Installations during the month	Data Reporting
Agro AWS	200	--	189
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)	--	10 (Delhi) NIL (Mumbai)**** NIL (Ahmedabad)
Hydromet. (India Meteorological Department (IMD) & Extra-departmental excluding AWS & ARG)	---	--	4657
Aviation	101	--	101
Radiation Stations	47	---	47

* Out of Total 808 commissioned, 204 are outlived.

** Out of total 1382 commissioned, 832 are outlived.

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

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

Modelling

During April 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 25th April 2024 the monthly mean forecast valid for May 2024 were also included for the users.

Monthly Weather Summary (April 2024)

a) Important Weather Events during the month

Western Disturbances (WDs):

Five (5) active WDs (1-8, 9-12, 11-17, 17-21 &, 24-29 April) caused rain/ snow over western Himalayan states and also caused rain/ Thunderstorms and hail storm over plains of north and central India. Lower-level winds with moisture incursions from north Bay of Bengal, caused heavy rainfall over Arunachal Pradesh, Assam & Tripura during the month.

Heat Wave:

During 5-7 April over eastern India and southeast Peninsular India and during 15-30 April over Odisha and West Bengal, Heat waves were intensified and expanded to Bihar Jharkhand, Southeast Peninsular India and interior Karnataka. However, no heat wave was observed over north & central India during April 2024 due to WDs moved from far west.

b) Rainfall Scenario:

The rainfall for the country as a whole, for the month of April-2024 has been recorded as 31.4 mm which is 80% of its Long Period Average (LPA) of 39.3 mm.

c) Heavy Rainfall Events:

Warning issued for	No. of Heavy/Very Heavy Rainfall Events (>64.4 mm): 306
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	Percentage correct (in %) for Rainfall >64.4mm
Day1 / 24 Hours	95
Day2 / 48 Hours	94
Day3 / 72 Hours	94

d) Temperature Scenario:

The mean temperature for the month of April-2024 for the country as a whole was 29.01°C which was above normal by 0.72°C. This is 9th highest since 1901. The maximum temperature of 47.2°C had been recorded at Kalaikunda (Gangetic West Bengal) on 30th April 2024 and the minimum temperature of 11.6°C had been recorded at Karnal (Haryana) on 2nd April 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	18	Nil	Nil	Nil
2.	Northwest India	27	11 (4, 16, 20-21, 23-24, 26-30 April)	Nil	Nil
3.	Northeast India	24	Nil	Nil	Nil
4.	East India	22	5 (8-11, 28 April)	1 (7 April)	Nil
5.	Central India	20	Nil	Nil	Nil
6.	West India	16	7 (9, 11-13, 17, 24-25 April)	Nil	Nil

Bulletins/Warnings/Press Releases Issued:

All India Weather Bulletins: 120; All India inference and severe weather warnings: 120; All India Weekly Weather Reports: 4; Daily Tropical Weather Outlook with cyclogenesis forecast for next 5 days: 30; Weekly Extended Range Outlook for Cyclogenesis for next 2 weeks: 4; Daily Warnings for Fishermen in North Indian

Ocean: 60; Fleet Forecast for Indian Navy for next 12 hours: 60; Bulletins for ships in deep sea under Global Maritime Distress Safety System (GMDSS) for next 36 hours: 60; Severe Weather Advisory Bulletins for nowcast guidance: 30; FDP STORM Bulletins: 30; Mountain weather bulletins issued for western and central Himalayan region: 60; All India Multi-hazard winter weather warnings bulletin issued for North India: 30; Current Temperature Status and Warning bulletins: 30; Press Releases issued during the month: 55.

Publications & Operational Reports:

1. Climate Summary for the month of March- 2024 was issued.
2. ENSO bulletin for the month of February 2024 and Seasonal Climate Outlook for South Asia for the period of April to July 2024 were issued.
3. Released "State of the Climate in Asia 2023 " (WMO-No. 1350) on 23 April 2024
4. Climate Diagnostic Bulletin for the month January, February and Winter season 2024 and Annual Climate Summary 2023 has been published and uploaded on the website.

Seismological Observational Network:

Observation Type	Commissioned so far	Data reporting during the month
Seismic stations	157	140

Earthquake and Tsunami monitoring

Earthquake:

136 earthquakes were monitored in the Indian region out of which 4 events were greater than the magnitude (M) of 5.0.

Tsunami:

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

Ocean Observation System

Type of Platform	Commissioned till during the month	Data received during the month
Argo Floats	115	73

Moored Buoys	19	11
Tide Gauges	36	33
High Frequency (HF) Radars	10	8
Acoustic Doppler Current Profiler (ADCP)	20	17
Tsunami Buoys	7	4
Wave Rider Buoy	16	11

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)	31
2.	Tuna Fishing Advisories	8
3.	Ocean State Forecast (OSF)-Wave, Wind, Currents, SST (Sea Surface Temperature), MLD (Mixed Layer Depth) and D20 forecasts	31
4.	Real time global ocean analysis (daily)	31
5.	Coral Bleaching Alert System	10

Outreach and Awareness

- During the Ocean Decade Week 8-12 April 2024 at Barcelona, Spain, the Indian delegation led by India National Decade Coordination Committee (NDC) chair Dr. M Ravichandran (Secretary, MoES) engaged with the stakeholders from around the globe.
- Report titled "General document on common questions and answers on cloud seeding" has been published by IITM.
- A Special Talk on 'Vision of Earth Sciences in the Amrit Kal' by Padma Shri Dr. Shailesh Nayak, Former Secretary, MoES was arranged on the eve of Earth Day Celebration 2024 on 22nd April 2024.
- A week-long training course organized by Indian National Centre for Ocean Information Services (INCOIS) on "Fundamentals of Remote Sensing and Oceanographic Applications" was held from 8-12 April 2024. Thirty-six (36) MSc. Students from Berhampur University, Odisha, and Mangalore University attended the course.

- Students from various colleges/ institutes/ universities/ schools visited IITM and INCOIS.
- INCOIS issued the followings:
 - One hundred and sixty-four (164) High wave/Swell Surge Alert/ Rough Sea Alert were issued to the West and East Coast of India, Andaman & Nicobar Islands.
 - Twirty-one (31) days forecasts were issued as Regional Specialized Meteorological Centre (RSMC) for Numerical Ocean Wave Prediction (wave and swells) and Global Numerical Ocean Prediction (currents, conservative temperature, MLD, 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) which is administrated by RIMES.
 - Twenty-seven (27) days Algal Bloom Information Service was issued, and two (2) days alert was generated.
 - INCOIS issued Rough Sea/Swell surge Alerts to the respective states/ Union Territories (UTs) on 29th, 30th & 31st March 2024.
 - Provided Ocean State Forecast (OSF) consultancy services of wind and wave parameters at their rig location to M/s McDermott, a firm supporting to Oil and Natural Gas Corporation Limited (ONGC) for exploration services.
- 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 by IMD every Thursday through website and social media. 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.

- Officers from the Indian Navy visited National Centre for Medium Range Weather Forecasting (NCMRWF) on 4-5th April 2024 for a Familiarization Course on Numerical Weather Prediction.

Publications

Subject	Publications			Ph.Ds.		
	Apr 2023 – Mar 2024	Apr 2024	Total	Apr 2023 – Mar 2024	Apr 2024	Total
Atmospheric Sciences	166	10	176	12	2	14
Ocean Science and Technology	106	13	119	4	0	4
Polar Sciences	32	5	37	1	0	1
Geosciences and resources	64	4	68	6	0	6
Total	368	32	400	23	2	25

Utilization of Ocean Research Vessels during the month

Vessel	Days at Sea/ Utilization	Maintenance/ Inspection/ Scientific Logistics/ Cruise Preparation	No. of Cruises
Sagar Nidhi	24	6	2
Sagar Manjusha	19	11	3
Sagar Tara	15	15	2
Sagar Anveshika	0	30	0
Sagar Kanya	0	30	0
Sagar Sampada	23	7	3

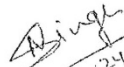
No.MoES/20/01/2017-Est.
Government of India
Ministry of Earth Sciences

Prithvi Bhavan, Lodhi Road
New Delhi-110 003
Dated, the May, 2024

**CERTIFICATE
(FOR THE MONTH OF APRIL, 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 April, 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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