

**Ministry of Earth Sciences (MoES)**  
**Govt. of India**  
**Summary of Important Developments – April, 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 13<sup>th</sup> July 2022 approved the merging of 5 Autonomous Bodies under MoES to one Autonomous Body. Efforts are underway to implement the same.

**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.

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**Important policy decision taken and major achievements:**

- The southwest monsoon seasonal (June to September) rainfall over the country as a whole is likely to be 96% of the Long Period Average (LPA).
- Currently, La Nina conditions changed to Neutral conditions over the equatorial Pacific region. The El Niño conditions are likely to develop during the monsoon season.
- During the 2023 hot weather season (April to June (AMJ)), most parts of the country is expected to experience above normal maximum temperatures, except for South Peninsular India and some parts of Northwest India where normal to below normal maximum temperatures are likely.
- Above normal heatwave days are likely to occur over most parts of Central India, East India and Northwest India during the hot weather season, April to June 2023.
- IMD signed Letter of Agreement with Bhabha Atomic Research Centre to enhance collaboration between the two agencies for establishment of environmental radiation network in IMD observatories by BARC.
- National Centre for Polar and Ocean Research (NCPOR) entered into an agreement with New Space India Limited, Bangalore to establish 24x7 satellite connectivity with Maitri station, Antarctica.

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)	*490	--	490
Automatic Rain Gauge (ARG)	**473	--	473
Agro AWS	200	--	194
GPS Sonde based RS/RWStns.	56	--	56
Doppler Weather Radar (DWR)	***39	--	30
Ozone (Ozone Sonde + Total Ozone)	02	--	02
Surface Ozone (Electrochemical Concentration Cell method)	07	--	05
Nephelometer	12	--	09
Sky Radiometer	20	--	17
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 & Extra-departmental excluding AWS &ARG)	---	--	3117
Aviation	94	--	94
Radiation Stations	47	---	47

\* Out of Total 808 commissioned, 318 are outlived.

\*\* Out of total 1382 commissioned, 909 are outlived.

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

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

## **Modelling**

During April 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 27<sup>th</sup> April 2023 the monthly mean forecast valid for May 2023 were also included for the users.

## **Monthly Weather Summary (April 2023)**

### **a) Important Weather Events during the month**

#### Western Disturbances:

There were 5 number of active Western Disturbances (WD) along with their series of induced circulations, affected northwest and central parts of the country during 2-6, 14-19, 21-25, 25-29, 27-30 April 2023. Persistence of trough/ wind discontinuity was also seen more prominently in the lower levels from extreme southern parts of the Peninsular India to Vidarbha/ East central India across central parts of the Peninsula India, during 1-10 and 22-30 April 2023 with embedded cyclonic circulation over southern Peninsular India during 21-30 April 2023. As a result, there were extensive rain and Thunderstorm activities reported accompanied with lightning and gusty winds and cloudy conditions over most parts of India mainly during 1-8 and 22 to 30 April 2023. Due to such extensive rain/ thunderstorm activities and cloudy conditions over most parts of India, large parts of India had experienced lower than normal day

maximum temperature over most of its regions during respective periods. During 27-30th April 2023, it was below normal by 5-13<sup>0</sup>C mainly over Central India.

**Heat Wave:**

During 12-20th April, one spell of heat wave condition was observed which was developed over to east coast of India mainly covering West Bengal, Bihar, Odisha and Coastal Andhra Pradesh, Punjab, Haryana, Chandigarh, Delhi and Uttar Pradesh, Konkan & Goa and Jharkhand.

**Heavy Rainfall Events:**

The April 2023 witnessed heavy rainfall events (64.5 to 115.5 mm of rainfall) mainly from Telangana, Tamilnadu, Puducherry & Karaikal, Kerala & Mahe, Odisha, Assam & Meghalaya, and very heavy rainfall (115.6 to 204.4 mm of rainfall) mainly from Tamilnadu, Puducherry & Karaikal.

**b) Rainfall Scenario:**

The country as a whole for the month of April 2023 recorded 41.4 mm of rainfall, which is 5% more than its Long Period Average (LPA) of 39.3 mm for the period 1971-2020.

**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	93
Day2 / 48 Hours	94
Day3 / 72 Hours	93

**d) Temperature Scenario:**

The mean temperature for the month of April 2023 for the country as a whole was 28.14<sup>0</sup>C which was above normal by +0.1<sup>0</sup>C. The maximum temperature of 44.5<sup>0</sup>C had been recorded at Prayagraj (East Uttar Pradesh) and Khajuraho (East Madhya Pradesh) on 19th April 2023 and the minimum temperature of 10.7<sup>0</sup>C had been

recorded at Umaria (East Madhya Pradesh) on 2nd April 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	27	1 {Bidar city-27 Apr}	Nil	Nil
2.	Northwest India	27	25 {Shimla (3,15,18,20,28,30 Apr), Pahalgam (4,20 Apr), Katra (20,22 Apr), Chandigarh-19 Apr, Bikaner-3 Apr, Sriganaganagar-3 Apr, Nagaur-3 Apr, Jodhpur-3 Apr, Batote-4 Apr, Banihal- 4 Apr, Mukteshwar- 4 Apr, Chamba- 15 Apr, Jhansi-28 Apr, Kangra-22 Apr, Balia-23 Apr, Aligarh-27 Apr, Muradabad- 27 Apr, Dehradun- 27 Apr)}	Nil	5 {Jaisalmer-10,18 Apr, Jodhpur-18 Apr, Churu-18 Apr, Sikar-19 Apr}
3.	Northeast India	22	Nil	2 {Tripura-6 Apr, Imphal- 19 Apr}	Nil
4.	East India	24	15 {Gangtok-10,16,19,20,28 Apr, Darjeeling-19,22 Apr, Tadong-10,21,28 Apr, Gopalpur-1 Apr, Pakyong-20 Apr, Jamshedpur- 25 Apr, Digha-27 Apr, Sriniketan-27 Apr}	8 {Alipore-1,4,27,30 Apr, Dumdum-1,4,27,30 Apr}	Nil
5.	Central India	25	3 { Sagar- 9 Apr, Pendra Road- 25,26}	4 {Nagpur-20,22,25,26}	Nil

S. No.	Region	Thunder Storm Days	Hail Events	Squall Events	Dust storms
			Apr}	Apr}	
6.	West India	15	3 {Pune-13 Apr, Nanded- 27 Apr, Udgair- 27 Apr }	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, Daily Severe Weather Guidance for next 5 days under Severe Weather Forecasting Programme: 30, Weekly Extended Range Outlook for Cyclogenesis for next 2 weeks: 4, Daily Warnings for Fishermen in North Indian Ocean for next 5 days: 30, Fleet Forecast for Indian Navy for next 12 hours: 60, Bulletins for ships in deep sea under Global Maritime Distress Safety System for next 36 hours: 60, Mountain weather bulletins issued for western and central Himalayan region:- 60, Expedition Forecast bulletins issued for Mt. Trishul Expedition conducted by AAW (Army Adventure Wing):- 3, Nowcast Guidance Bulletins for Severe Weather:- 30, Forecast Demonstration Project (FDP) Severe Thunder Storm Observation and Regional Modeling (STORM) Bulletins: 30, Heat wave Bulletins:-30, Press Releases issued during the month:- 41.

#### **Publications & Operational Reports:**

1. ENSO bulletin for the month of April 2023 and Seasonal Climate Outlook for South Asia for the period of April to July 2023 were issued.  
(Quick Link: [www.imdpune.gov.in/Clim\\_Pred\\_LRF\\_New/Products.html](http://www.imdpune.gov.in/Clim_Pred_LRF_New/Products.html))
2. Climate Diagnostic Bulletin for December 2022 and Post monsoon 2022 has been published and uploaded on the website.
3. Climate Summary for the month of March 2023 Issued.
4. Digital Current Weather Indication System (DCWIS) and Present Weather Detector (PWD) systems were installed at Kalburgi airport, PWD systems were installed at Runway (RWY)s 30 and 12, at Bhopal airport, PWD system was installed at RWY 27, Sindhudurg airport, and PWD system was installed at RWY 07, Kolhapur airport.



## Seismological Observational Network:

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

## Earthquake and Tsunami monitoring

### Earthquake:

144 earthquakes were monitored in the Indian region out of which 18 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 during the month	Data received during the month
Argo Floats	80	50
Moored Buoys	19	17
Tide Gauges	36	32
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)	31
2.	Tuna Fishing Advisories	20
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)	28
5.	Coral Bleaching Alert System	11

## **Outreach and Awareness**

- International Training Centre for Operational Oceanography (ITCOO)-INCOIS organized a training course on “Fundamentals of Remote Sensing & Geographic Information System (GIS) and Oceanographic Applications” during 10<sup>th</sup> – 14<sup>th</sup> April 2023.
- NCMRWF organized a day long workshop for data users from Renewable Energy (RE) sector, to bring together leading minds in the field to share insights and discuss emerging trends and challenges.
- Students from the various colleges/ institutes/ universities visited IITM, NCMRWF and NIOT.
- India Meteorological Department (IMD) conducted 19<sup>th</sup> WMO’s Tropical Cyclones Forecaster Training during 3<sup>rd</sup>-13<sup>th</sup> April, 2023. 106 participants including 26 International participants from Thailand, Myanmar, Bangladesh, Sri Lanka, Maldives, Pakistan, Iran, Oman, United Arab Emirate & Saudi Arabia, and 80 participants from various sub-offices of IMD participated.
- IMD conducted Pre-cyclone exercise and preparedness Meeting for the cyclone season (April-June) on 17<sup>th</sup> April, 2023. There were about 280 participants from different organisations including central level disaster management agencies, state level disaster management (DM) agencies, various Ministries & Departments, IMD’s sister organisations and research institutes.
- IMD conducted National Media Workshop on 28<sup>th</sup> April (Hybrid Mode) with participation from various media groups countrywide, All India Radio and also disaster management agencies like National Disaster Response Force, National Disaster Management Agency etc. During the inaugural ceremony following publications were released by IMD:
  - State-wise Climate Summary
  - Frequently Asked Questions (FAQs) on weather and climate services of IMD
  - Brochures of IMD indicating the new achievements and main activities
- 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 participated in the G20 events.

### **Publications**

Subject	Publications			Ph.Ds		
	April 22 – March 2023	April 23	Total	April 22 – March 2023	April 23	Total
Atmospheric Sciences	192	13	<b>205</b>	22	4	<b>26</b>
Ocean Science and Technology	89	10	<b>99</b>	7	1	<b>8</b>
Polar Sciences	29	-	<b>29</b>	1	-	<b>1</b>
Geosciences and resources	66	1	<b>67</b>	1	1	<b>2</b>
<b>Total</b>	<b>376</b>	<b>24</b>	<b>400</b>	<b>31</b>	<b>6</b>	<b>37</b>

### **Patents: 1**

### **Utilization of Ocean Research Vessels during the month**

Vessel	Days at Sea/ Utilization	Maintenance/ Inspection/ Scientific Logistics/ Cruise Preparation	No. of Cruises
Sagar Nidhi	30	0	1
Sagar Manjusha	19	11	3
Sagar Tara	22	8	2
Sagar Anveshika	0	30	0
Sagar Kanya	0	30	0
Sagar Sampada	0	30	0

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

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New Delhi-110 003  
Dated, the 08 May, 2023

**CERTIFICATE  
(FOR THE MONTH OF APRIL, 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 April, 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  
11 -
- c. Number of posts totally vacant as on date  
02 -
- d. Number of posts under additional charge arrangement  
00 -
- e. Number of posts that would fall vacant during the next 6 months  
01 -

  
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