

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

- MoES celebrated its 17<sup>th</sup> Foundation Day on 27<sup>th</sup> July 2023.
- Hon'ble Minister of Earth Sciences (HMoES), Shri Kiren Rijju virtually inaugurated four Meteorological Centres at Port Blair, Imphal, Kohima and Aizawl.
- HMoES inaugurated the campaign on Ocean Information and Advisory Services by Indian National Centre for Ocean Information Services (INCOIS) at Machilipatnam, Andhra Pradesh.
- HMoES visited Indian Institute of Tropical Meteorology (IITM), Indian Meteorological Department (IMD) and National Centre for Coastal Research (NCCR).
- A bilateral meeting between HMoES and Mr. Virginijus Sinkevičius, European Commissioner for Environment, Ocean & Fisheries, European Union (EU) was held in MoES to discuss the common issues for both, viz., Blue economy, Marine litter, Marine Bio-diversity, Marine Protected Areas (MPA's) and Ocean and Fisheries dialogue.
- Two scientists one each from Bangladesh and Mauritius participated in the ocean expedition in the Arabian Sea conducted by Indian National Centre for Ocean Information Services (INCOIS) onboard India's research vessel 'Sagar Nidhi' under the regional framework of Colombo Security Conclave (CSC).
- National Institute of Ocean Technology (NIOT) released and handed over the Oceanographic tool "Mooed Buoy Data Analysis and Representation Tool (M-DART)" to Indian Navy.
- NIOT exchanged two technology transfer licensing agreements for the technologies on "Mechanical Components of Met Ocean Buoy System-I &II with M/s. Next Eng Enviro Pvt Ltd Ahmedabad.
- A report containing the results and recommendations of the IITMs Cloud Aerosol and Precipitation Enhancement Experiment (CAIPEEX) Cloud Seeding Experiment conducted at Solapur Maharashtra has been released by the HMoES.

- The first ever concurrent observations of Black Carbon aerosols (BC) have been made over the Arabian Sea as well as over the inland location Solapur, Maharashtra by IITM during the summer monsoon period as part of the EKAMSAT initiative (Enhancing Knowledge of the Arabian Sea Marine environment through Science and Advanced Training) under a joint research initiative between India and the United States of America (USA).
- The Extreme Forecast Index (EFI) has been developed at IITM using the 10 years of climatology of Global Ensemble Forecast System (GEFS). The EFI is generated for 5 days lead time.
- IITM signed MoUs with Shivaji University, Kolhapur; Andhra Pradesh State Disaster Management Authority (APSDMA); Tezpur University, Assam and Aryabhata Research Institute of Observational Sciences (ARIES), Uttarakhand.
- National Centre for Medium Range Weather Forecasting (NCMRWF) signed MoUs with Council of Scientific & Industrial Research Fourth Paradigm Institute (CSIR-4PI) for research in Weather and Climate Sciences and with Department of Earth and Atmospheric Sciences, National Institute of Technology (NIT), Rourkela for academic and research collaborations.
- Winter participants of the 42<sup>nd</sup> Indian Scientific Expedition to Antarctica (42-ISEA) deployed ice-tethered oceanographic mooring at Prydz Bay, East Antarctica to collect data of under-ice water column physical parameters.
- Centre for Marine Living Resources & Ecology (CMLRE) established the tissue biobank /biorepository which facilitates systematic collection and storage of various biological specimens at ultra-low temperature.
- A two-day international workshop on “Advances in Coastal Research with special reference to Indo Pacific (AdCoRe – IP 2023)’ was organised by National Centre for Coastal Research (NCCR).
- Minister of Environment and Climate Change, Canada along with High Commissioner of Canada to India visited NIOT and NCCR.
- Technical report on Coral Reef Resilience Studies in Palk Bay, Southeast Coast of India and Coastal Inundation Risk Atlas (CIRA) for Tamil Nadu released by NCCR on the occasion of the AdCoRe-IP 2023.

- INCOIS was selected to host the IOCCG Summer Lecture Series (SLS) at Hyderabad by the International Ocean-Colour Coordinating Group (IOCCG).
- Rainfall over the country as a whole during the second half (August to September period) of the southwest monsoon season, 2023 is very likely to be normal (94 to 106% of Long Period Average (LPA)).
- The Southwest Monsoon has advanced on 2nd July 2023, against the normal date of 8th July (6 days ahead of the normal date for entire country coverage).
- Currently, weak El Niño conditions are prevailing over the equatorial Pacific region.

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)	*491	--	491
Automatic Rain Gauge (ARG)	**507	--	507
Agro AWS	200	--	195

Observation Type	Commissioned so far	Installations during the month	Data Reporting
Global Positioning System (GPS) Sonde based Radio Sonde (RS)/ Radio Wind (RW) Stations.	56	--	56
Doppler Weather Radar (DWR)	***40	--	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)	---	--	3082
Aviation	99	--	99
Radiation Stations	47	---	47

\* Out of Total 808 commissioned, 317 are outlived.

\*\* Out of total 1382 commissioned, 875 are outlived.

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

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

## Modelling

During July 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> July 2023 the monthly mean forecast valid for August 2023 were also included for the users.

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

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

#### Low Pressure Systems (LPS):

Four LPSs have been formed over Bay of Bengal (16-17<sup>th</sup> July, 20-22<sup>nd</sup> July, 24-28<sup>th</sup> July and 29-31<sup>st</sup> July 2023).

#### Western Disturbances (WDs):

4 WDs affected the north India (with 1 WD on 6-11<sup>th</sup> July 2023 interacted with monsoonal systems and causes extremely heavy rainfall over northwest India, 13-18<sup>th</sup> July, 20-23<sup>rd</sup> July and 28-31<sup>st</sup> July 2023).

#### Rainfall:

Two major extremely heavy rainfall Event (>204mm in a day) viz i) 8-13<sup>th</sup> July 2023 over Western Himalayan region and adjoining plains of northwest India; ii) 18-28<sup>th</sup> July 2023 over Gujarat, Maharashtra (including over Mumbai), Goa and Karnataka.

Four exceptional heavy rainfall event (>240mm in a day) viz i) 9<sup>th</sup> July 2023 over Chandigarh and adjoining Haryana and Himachal Pradesh; ii) 18<sup>th</sup> July 2023 Saurashtra, Veraval; iii) 20<sup>th</sup> July 2023 Konkan; iv) 27<sup>th</sup> July 2023 Telangana.

### **b) Rainfall Scenario:**

The rainfall for the country as a whole, for the month of July 2023 has been recorded as 315.9mm which is 113% of its Long Period Average (LPA) of 280.5 mm.

**c) Heavy Rainfall Events:**

<b>Warning issued for</b>	<b>No. of Heavy/Very Heavy Rainfall Events (&gt;64.4 mm): 330</b>
	<b>Percentage correct (in %) for Rainfall &gt;64.4mm</b>
Day1 / 24 Hours	74
Day2 / 48 Hours	75
Day3 / 72 Hours	73

**d) Temperature Scenario:**

The mean temperature for the month of July-2023 for the country as a whole was 28.39°C which was above normal by +0.41°C. The maximum temperature of 42.0°C had been recorded at Ganganagar & Bikaner (West Rajasthan) on 4th July 2023 and the minimum temperature of 18.4°C had been recorded at Nandyal (Rayalaseema) on 26th July 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:

<b>S. No.</b>	<b>Region</b>	<b>Thunder Storm Days</b>	<b>Hail Events</b>	<b>Squall Events</b>	<b>Dust storms</b>
1.	South Peninsular India	25	Nil	Nil	Nil
2.	Northwest India	31	1 {Srinagar- 26 July}	Nil	Nil
3.	Northeast India	30	Nil	Nil	Nil
4.	East India	31	Nil	4 {Portblair- 02, 24, 30 July, Gaya- 29 July}	Nil
5.	Central India	30	Nil	Nil	Nil



S. No.	Region	Thunder Storm Days	Hail Events	Squall Events	Dust storms
6.	West India	22	Nil	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, Daily Severe Weather Guidance for next 5 days under Severe Weather Forecasting Programme: 31, Weekly Extended Range Outlook for Cyclogenesis for next 2 weeks: 4, 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, Expedition Forecast bulletins issued for Mt. Kun Expedition conducted by The Indian Army (High Altitude Warfare School): 4, Expedition Forecast bulletins issued for Mt. Nun Expedition conducted by NIMAS (National Institute of Mountaineering and Adventure Sports): 18, Nowcast Guidance Bulletins for Severe Weather:- 31, Forecast Demonstration Project (FDP) Severe Thunder Storm Observation and Regional Modeling (STORM) Bulletins: 31, Current Temperature Status and Heat Wave Warning bulletins:-31, Press Releases issued during the month:- 43.

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

1. Climate Summary for the month of June, 2023 Issued.
2. I Niño-Southern Oscillation (ENSO) bulletin for the month of July 2023 and Seasonal Climate Outlook for South Asia for the period of July to October 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))
3. Climate Diagnostic Bulletin for the month of March and April 2023 has been published and uploaded on the website.
4. Digital Current Weather Indication System (DCWIS) and Present Weather Detector (PWD) systems were installed at Gondia airport (Runway (RWY) 04, PWD system was installed at Pantnagar airport (RWY 10), PWD system was installed at Thiruvananthapuram airport (RWY 32).

5. PWD systems were installed at Agartala RWY 05/23, Lilabari RWY 04/22, Barapani (Shillong ) RWY 04/22, Tezu RWY 04/22, Imphal RWY 04/22, Dimapur RWY 12/30, Rupsi RWY 05/23, Dibrugarh RWY 05/23, Donyi Polo (Hollongi) RWY 08/26, Guwahati RWY 02/20, Aizwal (Lengpui) RWY 17/35.

#### **Seismological Observational Network:**

<b>Observation Type</b>	<b>Commissioned so far</b>	<b>Data reporting during the month</b>
Seismic stations	153	131

#### **Earthquake and Tsunami monitoring**

##### Earthquake:

108 earthquakes were monitored in the Indian region out of which 3 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. These informations were provided in less than 12 minutes of occurrence of the events.

#### **Ocean Observation System**

<b>Type of Platform</b>	<b>Commissioned till during the month</b>	<b>Data received during the month</b>
Argo Floats	80	45
Moored Buoys	19	12
Tide Gauges	36	32
High Frequency (HF) Radars	10	8
Acoustic Doppler Current Profiler (ADCP)	20	17
Tsunami Buoys	7	1
Wave Rider Buoy	16	11

#### **Ocean Science Services**

<b>S. No.</b>	<b>Types of forecasts</b>	<b>No. of advisories issued during the month</b>
1.	Integrated Potential Fishing Zone (PFZ) advisories	30
2.	Tuna Fishing Advisories	6

<b>S. No.</b>	<b>Types of forecasts</b>	<b>No. of advisories issued during the month</b>
3.	Ocean State Forecast (OSF)-Wave, Wind, Currents, SST (Sea Surface Temperature), MLD (Mixed Layer Depth) and Heavy Water (D20) forecasts	30
4.	Real time global ocean analysis (daily)	30
5.	Coral Bleaching Alert System	11

### **Outreach and Awareness**

- A short documentation movie by NCMWRF on Delhi Fog Model was launched by the HMoES.
- A video film on India Meteorological Department (IMD) cyclone warning and management in India: An end to end system was released by the HMOES.
- As a part of Azadi Ka Amrit Mahotsav, two 'Mega Awareness Campaigns on Ocean Information and Advisory Services' were conducted by INCOIS at Machilipatnam, Andhra Pradesh, and Veraval, Gujarat.
- The International Training Centre for Operational Oceanography (ITCOcean) conducted a two (2-day) training program (11-12th July 2023) for the offshore Exploration & Production industries on "Operational Oceanography, Marine Meteorology & Operational Ocean Forecasting, Warning and Advisory Services."
- IITM has observed the Haryali Saptah/Van Mahostav 2023 by conducting various awareness activities towards the environmental protection.
- Students from various schools/ universities/ institutes visited various Institutes of MoES.
- Two hundred and six (206) High wave/Swell Surge Alert/ Rough Sea Alert were issued to West and East Coast of India, Andaman & Nicobar Islands.
- India Meteorological Department (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.

### **Publications**

Subject	Publications			Ph.Ds		
	April 2023 – June 2023	July 23	Total	April 2023 – June 2023	July 23	Total
Atmospheric Sciences	39	17	56	5	2	7
Ocean Science and Technology	31	5	36	2	-	2
Polar Sciences	4	3	7	-	-	-
Geosciences and resources	9	9	18	2	-	2
<b>Total</b>	<b>83</b>	<b>34</b>	<b>117</b>	<b>9</b>	<b>2</b>	<b>11</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	26	5	1
Sagar Manjusha	16	15	2
Sagar Tara	15	16	1
Sagar Anveshika	22	9	2
Sagar Kanya	0	31	0
Sagar Sampada	0	31	0

MoES/20/01/2017-Estt.

I/5526/2023

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

Prithvi Bhavan, Lodhi Road  
New Delhi-110 003  
Dated, the 09 August, 2023

CERTIFICATE  
(FOR THE MONTH OF JULY, 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 July, 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 | - 02 |



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