

**Ministry of Earth Sciences (MoES)**  
**Govt. of India**  
**Summary of Important Developments – July, 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 July 2024 in MoES and its institutes.

**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. 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 26<sup>th</sup> 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.

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

- Union Cabinet approved India's signing of the Biodiversity Beyond National Jurisdiction (BBNJ) Agreement, an international treaty under the United Nations Convention on the Law of the Sea (UNCLOS).
- The Ministry of Earth Sciences (MoES) celebrated its 18<sup>th</sup> Foundation Day on 27<sup>th</sup> July 2024. On this Occasion, following publications were launched:
  - The India Meteorological Department (IMD) released the 'Standard Operation Procedure on "Cyclone Warning in India" and 'Competency Framework for Monitoring and Forecasting High-impact Weather Events'..
  - The National Centre for Polar and Ocean Research (NCPOR), Goa released a consolidated report on the 14<sup>th</sup> Indian Arctic Expedition (2023-24), including India's maiden winter Arctic Expedition (launched on December 18, 2023).
  - The Centre for Marine Living Resources and Ecology (CMLRE), Kochi released a catalogue entitled 'Taxonomy and Systematics of Anomuran Crabs (Paguroidea, Chirostyloidea and Galattheoidea) from the Indian EEZ (Exclusive Economic Zone)'.
  - The first issue of the MoES Newsletter, envisaged to be a quarterly publication highlighting news, events, and updates from MoES, was also released.
- Union Minister Dr. Jitendra Singh hold a meeting to review the on-going Indo-Norway collaboration on Blue-Economy with Norwegian Ambassador to India on 12<sup>th</sup> July 2024.
- Dr. T. Srinivasa Kumar, Director, INCOIS took additional charge of Director of NIOT on July 1, 2024.
- BIMSTEC Centre for Weather & Climate (BCWC) at NCMRWF, NOIDA conducted a 2 –Week workshop on Data Assimilation and Forecast Verification Techniques from July 15-26, 2024 for BIMSTEC countries.
- INCOIS scientists conducted a cruise onboard RV Sagar Nidhi in the Arabian Sea from 22 June - 15 July 2024 as part of the EKAMSAT program to study the physical and biological variabilities during the monsoon period.
- IMD issued the forecast for the rainfall during the second half of the season (August + September 2024) and for the month of August, 2024.

- The collaborations under “Weather and Climate Science for Service Partnership India (WCSSP India)” between MoES and Met Office, UK has been extended for another 5 years.
- NCPOR signed a contract with M/s Garden Reach Shipbuilders & Engineers, Kolkata on 16<sup>th</sup> July, 2024 for Construction and delivery of Ocean Research Vessel.
- NCPOR Arctic Expedition batch-03, reached Indian Arctic station ‘Himadri’ on 01 July 2024 and undertook their research activities at Himadri.
- A team of four members from NCPOR has successfully conducted various field activities such as ablation and accumulation measurements and discharge measurements under Himalayan Cryosphere studies.
- IMD signed the MoU’s with following organizations to strengthen collaborative research & development:
  - Climate Resilient Observing-Systems Promotion Council (CROPC).
  - All India Disaster Mitigation Institute, Ahmedabad.
  - Survey of India.
  - Jaypee Institute of Information Technology, Noida

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)	772*	--	772
Automatic Rain Gauge (ARG)	482**	--	482
Agro AWS	200	--	180
Global Positioning System (GPS) Sonde based Radio-Sonde (RS)/ Radio-Wind (RW) stations	56	--	56
Doppler Weather Radar (DWR)	41***	--	39
Ozone (Ozone Sonde + Total Ozone)	02	--	02
Surface Ozone (Electrochemical Concentration Cell method)	09	--	05
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)	---	--	4766
Aviation	108	--	107
Radiation Stations	47	---	47

\* Out of Total 1008 commissioned, 236 are outlived.

\*\* Out of total 1382 commissioned, 900 are outlived.

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

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

## **Modelling**

Every 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 25<sup>th</sup> July 2024 the monthly mean forecast valid for August 2024 were also included for the users.

Weekly BIMSTEC Map Discussion based on model output and observations (analysis) continued, where participants from all the BIMSTEC member countries Hydro-Met departments took part.

## **Monthly Weather Summary (July 2024)**

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

#### Depressions and Low Pressure:

A low pressure area formed over northwest and adjoining west-central Bay of Bengal off South Odisha coast in the morning (0830 hours IST) of 15<sup>th</sup> July, 2024. It lay as a well marked low pressure area over central and adjoining north Bay of Bengal in the evening (1730 hours IST) of 18<sup>th</sup> July, 2024. It moved northwestwards and concentrated into a depression over northwest and adjoining west-central Bay of Bengal off Odisha and adjoining north Andhra Pradesh coasts in the morning (0830 hours IST) of 19<sup>th</sup> July, 2024. Continuing to move further northwestwards, it crossed Odisha coast near Chilika Lake in the early morning (0530 hours IST) of 20<sup>th</sup> July. Further moving northwestwards, it weakened into a well-marked low pressure area over coastal Odisha in the same evening. Besides this Depression, 2 more low pressure systems formed and moved during July 2024 (15 -17 and 26-28 July). These three systems helped to get a good amount of rainfall over the central Indian region

and the west coast of India. MJO phase was also favourable for monsoon rainfall over Indian region.

Extremely Heavy rainfall spell observed over northeast India and and Sub-Himalaya West Bengal during 12-20 June 2024 which causes Floods in these areas.

**b) Rainfall Scenario:**

The rainfall for the country as a whole, for the month of July-2024 has been recorded as 305.8 mm which is 109% of its Long Period Average (LPA) of 280.5 mm. The rainfall statistics for the month of July- 2024 for 4 homogeneous regions and the country as a whole is given below:

Region	Actual (mm)	Normal (mm)	% Departure from Long Period Average
EAST & NORTHEAST	325.3	424.1	-23%
NORTHWEST INDIA	179.7	209.7	-14%
CENTRAL INDIA	427.2	321.3	+33%
SOUTH PENINSULA INDIA	279.2	204.5	+37%
<b>COUNTRY AS A WHOLE</b>	<b>305.8</b>	<b>280.5</b>	<b>+9%</b>

**c) Heavy/Extreme Rainfall Events:**

July 2024 witnessed extremely very heavy rainfall events ( $\geq 204.4$  mm) mainly along the west coast of India, Assam & Meghalaya, Saurashtra and & Kutch and some regions along the foothills of the Himalayas (Uttarakhand and Utter Pradesh). Very heavy rainfall events (115.6 – 204.4 mm) were reported over many places in central parts of India along the western Ghat region. The heavy rainfall events (64.5 – 115.5 mm) were observed over many locations in most parts except Jammu & Kashmir & Ladakh. Exceptional heavy rainfall reported over west Uttar Pradesh and Uttarakhand on 8<sup>th</sup> July (Baheri (Dist Bareilly) - 46cm and Banbasa (Champawat) - 43cm); on 19<sup>th</sup> July (Porbandar (Dist Porbandar)- 49cm, Kalyanpur (Dist Devbhoomi Dwarka)- 29cm; on 20<sup>th</sup> July (Dist Devbhoomi Dwarka - Devbhoomi Dwarka - 42 cm); and on 25<sup>th</sup> July Pune Dist-Tamini-56 cm, Lavasa-45 cm; Lonavala agri (Dist Pune) 35cm.

Number of Heavy/Very Heavy Rainfall Events ( $>64.4$ mm) and Warning Skill (correctness in %) for heavy rainfall for the month of July-2024 is given below:

<b>Warning issued for</b>	<b>No. of Heavy/Very Heavy Rainfall Events (&gt;64.4 mm): 306</b>
	<b>Percentage correct (in %) for Rainfall &gt;64.4mm</b>
Day1 / 24 Hours	77
Day2 / 48 Hours	71
Day3 / 72 Hours	70

**d) Temperature Scenario:**

All India average temperature during July 2024 was 28.65°C (0.70 °C above normal of 27.95°C). The highest maximum temperature of 44.6°C had been recorded at Ganganagar (West Rajasthan) on 3<sup>rd</sup> July 2024 and the lowest minimum temperature of 17.5°C had been recorded at Dehri & Yeotmal (Bihar & Vidarbha) on 12<sup>th</sup> & 25<sup>th</sup> July 2023 over the plains of the country during the month.

**e) Thunder Squall & Hailstorm activity:**

Thunder squall & Hailstorm activity during the month is given in the table below:

S. No.	State/UT	Thunderstorms	Hail Events	Dust storms	Gusty Winds
1	Andaman & Nicobar	5	0	0	0
2	Andhra Pradesh	5	0	0	0
3	Arunachal Pradesh	21	0	0	0
4	Assam	17	0	0	0
5	Bihar	25	0	0	0
6	Chandigarh	25	0	0	0
7	Chhattisgarh	19	0	0	0
8	Dadar and Nagar Haveli	23	0	0	0
9	Delhi	22	0	0	0
10	Goa	25	0	0	0
11	Gujarat	25	0	0	0
12	Haryana	24	0	0	0
13	Himachal Pradesh	24	0	0	0
14	Jammu & Kashmir	21	0	0	0
15	Jharkhand	27	0	0	0
16	Karnataka	22	0	0	0
17	Kerala	25	0	0	0
18	Ladakh	27	0	0	0
19	Lakshadweep Islands	30	0	0	0
20	Madhya Pradesh	29	0	0	0
21	Maharashtra	18	0	0	0
22	Manipur	18	0	0	0
23	Meghalaya	3	0	0	0
24	Mizoram	2	0	0	0
25	Nagaland	0	0	0	0



26	Odisha	26	0	0	0
27	Puducherry	26	0	0	0
28	Punjab	20	0	0	0
29	Rajasthan	12	0	0	0
30	Sikkim	6	0	0	0
31	Tamilnadu	11	0	0	0
32	Telangana	16	0	0	0
33	Tripura	2	0	0	0
34	Uttar Pradesh	4	0	0	0
35	Uttarakhand	13	0	0	0
36	West Bengal	3	0	0	0

### **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: 31
- 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
- Expedition Forecast bulletins issued for Mt. Kun expedition conducted by Indian Army: 4
- Expedition Forecast bulletins issued for Mt. Nun Expedition conducted by NIMAS: 18
- All India Multi-hazard winter weather warnings bulletin issued for North India: 30,
- Current Temperature Status and Heatwave warning bulletins: 31
- Press Releases issued during the month: 43.

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

1. ENSO bulletin for the month of July 2024 and Seasonal Climate Outlook for South Asia for the period of July to October 2024 were issued.
2. Climate Summary for the month of June 2024 issued.

### **Seismological Observational Network:**

<b>Observation Type</b>	<b>Commissioned so far</b>	<b>Data reporting during the month</b>
Seismic stations	157	122

### **Earthquake and Tsunami monitoring**

#### Earthquake:

99 earthquakes were monitored in the Indian region out of which 17 events were greater than the magnitude (M) of 5.0.

#### Tsunami:

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

### **Ocean Observation System**

<b>Type of Platform</b>	<b>Commissioned till during the month</b>	<b>Data received during the month</b>
Argo Floats	118	74
Moored Buoys	19	12
Tide Gauges	36	31
High Frequency (HF) Radars	10	7
Acoustic Doppler Current Profiler (ADCP)	20	17
Tsunami Buoys	7	4
Wave Rider Buoy	16	9

### **Ocean Science Services**

<b>Types of forecasts</b>	<b>No. of advisories issued during the month</b>
Integrated Potential Fishing Zone (PFZ) advisories	31
Tuna Fishing Advisories	3
Ocean State Forecast (OSF)-Wave, Wind, Currents, SST (Sea Surface Temperature), MLD (Mixed Layer Depth) and D20 forecasts	31
Real time global ocean analysis (daily)	31
Coral Bleaching Alert System	10

### **Outreach and Awareness**

- Over 45 trainee officers from NIRD&PR (Officials from LGA, Maldives) and MANAGE, Hyderabad, visited INCOIS on July 24, 2024, witnessed state-of-the-art ocean science technologies & services provided for the benefit of coastal communities and also engaged in valuable knowledge exchange.
- Thirteen (13) Sastra Prathibhas (School students selected from GCC Countries through Science India Forum, VIBHA) visited INCOIS Hyderabad & acquired knowledge on various oceanic services provided by INCOIS. These young minds were incredibly engaging with thought-provoking questions to scientists.
- Over sixty-five (65) students from T.I.M.E International School, Hyderabad, visited INCOIS on July 5, 2024, and gained insights into various oceanic services. The young minds were fascinated to learn how these services help coastal communities by providing early warnings.
- Over 25 MTech students from VNR-VJIT Hyderabad visited July 19, 2024 had an enriching experience at INCOIS & gained valuable insights into various oceanographic services, utilization of satellite data & scientific endeavours to safeguard coastal communities.
- IMD organised Online International Webinar on “SDS Monitoring and Forecasting” jointly organized by RA II’s Working Group on Services (WG-Services) and the Sand and Dust Storm Warning Advisory and Assessment System (SDS-WAS) Asian Node on 12.07.2024.
- NCCR organised a session titled “Ocean Ecosystem Accounting Experiences from India and Norway’ with NIVA, Norway under the INECO project during the 5th Global Dialogue on Sustainable Ocean Development, Bali.
- 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 (up to two weeks) were issued by IMD 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 by IMD through social media including Facebook, Twitter, Instagram, YouTube and IMD Blog page.

- INCOIS issued the followings:
  - Monthly El Niño Southern Oscillation (ENSO) outlook bulletin.
  - Three hundred and ninety six (396) High wave/Swell Surge Alert/ Rough Sea Alert were issued to the West and East Coast of India, Andaman & Nicobar Islands.
  - Three (03) INCOIS-IMD joint bulletins were issued due to the Depression over Northwest and adjoining West central Bay of Bengal during 20-21 July 2024.
  - Twirty (30) days forecasts were issued as Regional Specialized Meteorological Centre (RSMC) for (i) Numerical Ocean Wave Prediction (wave and swells) and (ii) Global Numerical Ocean Prediction (currents, conservative temperature, MLD, absolute salinity) for the Indian Ocean.
  - Thirty (30) days ocean state forecasts were issued to Pacific Islands Countries (PIC)and Colombo Security Conclave (CSC).
  - 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 nine (29) days Algal Bloom Information Service was issued, but no alert was generated.
  - One (01) Search and Rescue Aid Tool (SARAT) advisory provided for Navy, WNC for missing of Life Raft (boat) on 15 July 2024.
  - Provided OSF consultancy services of wave and swell parameters at Mulapeta port location to M/s Vishwa Samudra.

### **Publications**

Subject	Publications			Ph.Ds.		
	Apr – June 2024	July 2024	Total	Apr – May 2024	June 2024	Total
Atmospheric Sciences	35	2	37	2	0	2
Ocean Science and Technology	25	11	36	1	0	1
Polar Sciences	14	1	15	0	0	0
Geosciences and resources	11	9	20	4	1	5

<b>Total</b>	<b>85</b>	<b>17</b>	<b>108</b>	<b>7</b>	<b>4</b>	<b>8</b>
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**Patents: Nil**

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

<b>Vessel</b>	<b>Days at Sea/ Utilization</b>	<b>Maintenance/ Inspection/ Scientific Logistics/ Cruise Preparation</b>	<b>No. of Cruises</b>
Sagar Nidhi	23	8	2
Sagar Manjusha	11	20	3
Sagar Tara	14	17	1
Sagar Anveshika	16	15	2
Sagar Kanya	0	31	0
Sagar Sampada	27	4	1

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

Prithvi Bhavan, Lodhi Road  
New Delhi-110 003  
Dated, the 12<sup>th</sup> August, 2024

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



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