

**Ministry of Earth Sciences (MoES)**

**Govt. of India**

**Summary of Important Developments – September, 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 September 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:**

- Hon'ble Prime Minister dedicated High-Performance Computer (HPC) system tailored for Weather and Climate Research to the Nation on 26<sup>th</sup> Sep 2024. One of such HPC named “Arunika” is placed at NCMRWF and one at IITM Pune (named “Arka”). With this augmentation, the Ministry of Earth Sciences will enhance its total computing power to 22 Peta FLOPS, a substantial increase from the previous capacity of 6.8 Peta FLOPS.
- The Union Cabinet in its meeting on 11<sup>th</sup> Sept 2024 approved the 'Mission Mausam' with an outlay of Rs.2,000 crore over two years. Mission Mausam, to be chiefly implemented by the Ministry of Earth Sciences, is envisaged to be a multi-faceted and transformative initiative to tremendously boost India's weather and climate-related science, research, and services.
- MoES organised a press briefing on Mission Mausam on 12<sup>th</sup> September 2024 and provided valuable insights into the initiative's goals and impact on India.
- The Ocean Energy Atlas prepared by INCOIS was inaugurated by Secretary, MoES on 12<sup>th</sup> Sept 2024 at INCOIS, Hyderabad.
- Secretary, MoES inaugurated the Antarctic Huts facility on 29<sup>th</sup> Sept 2024 at ITBP Campus, Auli.
- India's first Urban Radar Network over Mumbai Metropolitan Region established by IITM, Pune was inaugurated by Secretary, MoES on 14<sup>th</sup> Sept 2024 in Colaba, Mumbai.
- MoES successfully concluded the Swachh Sagar, Surakshit Sagar 3.0 campaign on September 21<sup>st</sup>, 2024, facilitating beach cleanup drives at more than 80 locations across the country's coasts, removing more than 60 tons of waste, including plastic, metal, cloth, rubber, and paper and wood debris.
- An 8-week training courses for 10 international candidates as per the PMN Contract between MoES and International Seabed Authority (ISA) commenced at NIOT, Chennai from 10<sup>th</sup> Sep 2024.
- An 8-week training courses for 5 international candidates as per the PMS Contract between MoES and International Seabed Authority (ISA) commenced at NCPOR, Goa from 16<sup>th</sup> Sep 2024.

- Five new species of squat lobsters were discovered from the Indian EEZ. The specimens were collected during various scientific expedition on-board FORV Sagar Sampada.
- IMD signed a MoU with Space Application Centre (SAC), Ahmedabad to promote collaborative activities on 30<sup>th</sup> September 2024.
- The Indian Institute of Tropical Meteorology (IITM), Pune, and the Watershed Organisation Trust (WOTR), New Delhi entered into a MoU to collaborate on advancing hydro-meteorological research and community engagement in climate science.
- The MoU between IITM and PMOD/WRC (Physical Meteorological Observatory in Davos/World Radiation Centre) for the international project titled "Exploring the Chemical and Climatic Impacts of Solid Particles for Stratospheric Solar Geoengineering," was signed on 11<sup>th</sup> September 2024.

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)	835*	--	835
Automatic Rain Gauge (ARG)	455**	--	455

Observation Type	Commissioned so far	Installations during the month	Data Reporting
Agro AWS	200	--	172
Global Positioning System (GPS) Sonde based Radio-Sonde (RS)/ Radio-Wind (RW) stations	56	--	56
Doppler Weather Radar (DWR)	*** 41	--	36
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)	---	--	4710
Aviation	108	--	107
Radiation Stations	47	---	47

\* Out of Total 1008 commissioned, 173 are outlived. \*\* Out of total 1382 commissioned, 927 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 26<sup>th</sup> September 2024 the monthly mean forecast valid for October 2024 were also included for the users.

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

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

During the month of September 2024, there were five Western Disturbances (1-7, 8-13, 13-19, 16-18 and 28-29 September moved across extreme north India and 3 WDs (8-13, 13-19, 16-18) interacted with monsoonal low-pressure areas.

With the reduction in the rainfall and formation of the anti-cyclonic circulation in lower troposphere, withdrawal of the southwest monsoon 2024 began from West Rajasthan and Kachchh on 23rd September against the normal date of 17th September.

During the month, three low-pressure systems formed. The country as a whole received excess rainfall during September mainly due to the west/ north-westward movement of three low-pressure systems and their associated cyclonic circulations along the monsoon trough from the Northwest Bay of Bengal towards central India. A depression formed over northwest & adjoining westcentral Bay of Bengal on 8th September. A depression formed over northeast Bay of Bengal adjoining Bangladesh on 12th September. A low pressure area was formed over westcentral Bay of Bengal & adjoining northwest Bay of Bengal off north Andhra - south Odisha coasts, which moved towards south Chhattisgarh & neighborhood across Odisha on 25th September.

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

The rainfall over the country as a whole for the month of September 2024 was 187.3 mm which is 12% more than its Long Period Average (LPA) of 167.9 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	80
Day2 / 48 Hours	77
Day3 / 72 Hours	76

**d) Temperature Scenario:**

All India average temperature during September 2024 was 27.88°C above normal by 0.76°C which was 2nd highest since 1901. The maximum temperature of 43.3°C had been recorded at Pokhran (West Rajasthan) on 26th September 2024 and the minimum temperature of 17.8°C had been recorded at Delhi Ridge (New Delhi) on 13th & 19th September 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.	Met Sub-Division	Thunderstorms Days
1.	Andaman & Nicobar Islands	4
2.	Arunachal Pradesh	3
3.	Assam & Meghalaya	21
4.	Nagaland, Manipur, Mizoram & Tripura	16
5.	Sub-Himalayan West Bengal & Sikkim	18
6.	Gangetic West Bengal	22
7.	Odisha	25
8.	Jharkhand	21
9.	Bihar	16
10.	East Uttar Pradesh	22

<b>S. No.</b>	<b>Met Sub-Division</b>	<b>Thunderstorms Days</b>
11.	West Uttar Pradesh	12
12.	Uttarakhand	17
13.	Haryana Chandigarh & Delhi	17
14.	Punjab	11
15.	Himachal Pradesh	19
16.	Jammu & Kashmir And Ladakh	15
17.	West Rajasthan	11
18.	East Rajasthan	14
19.	West Madhya Pradesh	19
20.	East Madhya Pradesh	20
21.	Gujarat Region	15
22.	Saurashtra & Kutch	9
23.	Konkan & Goa	5
24.	Madhya Maharashtra	5
25.	Marathwada	2
26.	Vidarbha	17
27.	Chhattisgarh	25
28.	Coastal Andhra Pradesh & Yanam	19
29.	Telangana	15
30.	Rayalaseema	6
31.	Tamil Nadu Puducherry & Karaikal	18
32.	Coastal Karnataka	4
33.	North Interior Karnataka	10
34.	South Interior Karnataka	2
35.	Kerala & Mahe	9
36.	Lakshadweep	1

#### **Bulletins/Warnings/Press Releases Issued:**

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, 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. Kamet & Mt. Abi Gamin expedition by ITBP:- 05, Expedition Forecast bulletins issued for Mt. Mukut East expedition by BSF:- 12, Expedition Forecast bulletins issued for Mt. Abi Gamin expedition by NCC:- 18, Expedition Forecast bulletins issued for Mt. Gorichen expedition by NIMAS: 15, Expedition Forecast bulletins issued for Mt. Gorichen West expedition by NIMAS: 08, Expedition Forecast bulletins issued for Mt. Satopanth expedition by Army Adventure Wing:- 26, Nowcast Guidance Bulletins for Severe Weather:- 30, FDP STORM Bulletins: 30, Current Temperature Status and Heat Wave Warning bulletins:-30, Press Releases issued during the month:- 43, Daily Tropical Weather Outlook with cyclogenesis forecast for next 7 days: 30, Daily Severe Weather Guidance for next 5 days under Severe Weather Forecasting Programme: 30, 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.

**Publications & Operational Reports:**

1. ENSO bulletin for the month of September 2024 and Seasonal Climate Outlook for South Asia for the period of September to December 2024 were issued (QuickLink: [https://imdpune.gov.in/cmpg/Product/ENSO\\_Bulletin/ENSO\\_IOD\\_Update\\_Bulletin\\_09\\_24.pdf](https://imdpune.gov.in/cmpg/Product/ENSO_Bulletin/ENSO_IOD_Update_Bulletin_09_24.pdf))
2. Climate Summary for the month of August- 2024 issued.

**Seismological Observational Network:**

Observation Type	Commissioned so far	Data reporting during the month
Seismic stations	160	115

**Earthquake and Tsunami monitoring**

Earthquake:

121 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>6.5) with a potential to generate tsunami have 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	119	75
Moored Buoys	19	11
Tide Gauges	36	32
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>S. No.</b>	<b>Types of forecasts</b>	<b>No. of advisories issued during the month</b>
1.	Integrated Potential Fishing Zone (PFZ) advisories	31
2.	Tuna Fishing Advisories	14
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**

- IITM organized the workshop jointly with Indian Aerosol Science & Technology Association (IASTA) during 30 September – 04 October 2024. The workshop focused on wide range of instrumentation and measuring techniques for studying different atmospheric aerosols and their characteristics.
- INCOIS hosted a one-day operational services training course for National Institute of Hydrography Officers on Sept 12, 2024. The sessions were focused

on understanding ocean state forecast products, tsunami decision support systems, and hands-on exposure to products & services of INCOIS.

- On 17 Sept 2024, the 'Swachhata Hi Seva 2024' celebration commenced with a Swachhata Pledge in MoES and its institutes, where the staff committed to maintaining cleanliness across the nation. The officials united to form a Human Chain rally, under 'Swachhata Hi Seva 2024', to promote a clean environment for a healthy planet.
- INCOIS, in collaboration with NDMA, hosted a two-day Tsunami-SOP Workshop from 25-26 Sep 2024 that focused on SOPs, tsunami bulletins, and dissemination mechanisms. & a dedicated session on tabletop exercises with key stakeholders such as DMOs, Media from coastal States/UTs
- Under Swachhata Hi Seva, MoES and its institutes participated in the 3rd edition of 'Swachh Sagar, Surakshit Sagar'. Staff & volunteers joined at various beaches to clean our coastal waters for sustainable marine life.
- INCOIS, Hyderabad, conducted a week-long, in-person training course on "Tsunamis and Marine hazards" for Oman National Multi-Hazard Early Warning Centre delegates from 02-06 September 2024.
- INCOIS, in coordination with Gujarat State Disaster Management Authority (GSDMA), conducted a sensitization meeting and training on tsunami-ready implementation for disaster management officials from 10-11 September 2024 at Gandhinagar, Gujarat.
- INCOIS organized the 'Tsunami Standard Operating Procedure (SOP)' workshop for all coastal disaster management officials from 25-26 September 2024. About thirty (30) participants from various states/UTs attended, and a tabletop exercise was conducted as part of the workshop.
- 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 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.
- INCOIS issued the followings:
  - Four hundred and ninety-two (492) 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 (i) Numerical Ocean Wave Prediction (wave and swells) and (ii) Global Numerical Ocean Prediction (currents, conservative temperature, MLD, absolute salinity) for the Indian Ocean.
  - Nineteen (19) - INCOIS-IMD joint bulletins were issued in connection with Asna cyclone in over northeast Arabian Sea during 30-31 August 2024 and Deep Depression over northwest and adjoining west central Bay of Bengal during 8-9 September 2024.
  - Thirty-one (31) days of 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.
  - Thirty-one (31) days Algal Bloom Information Service was issued, and no alert was generated.
  - On the INCOIS website, there is an option to register and use the online applications for forecasts along the shipping route and Search and Rescue Aid Tool (SARAT) advisories. This month, No. of registered users for Forecast along the ship route- forty-seven (47) and SARAT (23).
  - Provided OSF consultancy services of wave and swell parameters at Mulapeta port location to M/s Vishwa Samudra.

## **Publications**

Subject	Publications			Ph.Ds.		
	Apr - Aug 2024	Sep 2024	Total	Apr - Aug 2024	Sep 2024	Total
Atmospheric Sciences	48	13	61	4	1	5
Ocean Science and Technology	30	8	38	1	1	2
Polar Sciences	15	0	15	0	0	0
Geosciences and resources	14	7	21	6	0	6
<b>Total</b>	<b>107</b>	<b>28</b>	<b>135</b>	<b>11</b>	<b>2</b>	<b>13</b>

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

Vessel	Days at Sea/ Utilization	Maintenance/ Inspection/ Scientific Logistics/ Cruise Preparation	No. of Cruises
Sagar Nidhi	20	10	2
Sagar Manjusha	0	30	0
Sagar Tara	0	30	0
Sagar Anveshika	13	17	1
Sagar Kanya	0	30	0
Sagar Sampada	20	10	1

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

Prithvi Bhavan, Lodhi Road  
New Delhi-110 003  
Dated, the 04<sup>th</sup> October, 2024

**CERTIFICATE  
(FOR THE MONTH OF SEPTEMBER, 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 September, 2024. A summary of the status as on 30.09.2024 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	–	01



(D. Senthil Pandiyan)  
Joint Secretary

js@moes.gov.in

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