

## Ministry of Earth Sciences (MoES)

### Summary of Important Developments – September, 2022

- 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.
- 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 complied with:** It is also 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.

\*\*\*\*\*

### Important policy decision taken and major achievements:

- The Northeast Monsoon Season (October to December (OND)) 2022 rainfall over the south Peninsular India consisting of five meteorological subdivisions (Tamil Nadu, Puducherry & Karaikkal, Coastal Andhra Pradesh & Yanam, Rayalaseema, Kerala & Mahe and South Interior Karnataka) is most likely to be normal (88-112% of Long Period Average (LPA)).
- During the month of September 2022, the country as whole received excess rainfall (108% of LPA) mainly over North & Central India especially over Indo-gangetic plains. Increase in the strength of La Nina conditions, formation of low pressure systems and frequent passage of Western Disturbances and their interaction with the low pressure systems had caused the excess rainfall activity.
- A MoU was signed between India Meteorological Department (IMD) and South Asian Institute for Advanced Research and Development (SAIARD), Kolkata for collaborative research on meteorology.
- A MoU was signed between India Meteorological Department (IMD) and Punjabi University, Patiala, Punjab to strengthen the future research endeavors at both the organizations.
- Centre for Marine Living Resources and Ecology (CMLRE) found three anomuran squat lobsters including the reef-associated *Munida Samudrika* (Southeastern Arabian Sea and Bay of Bengal, 32–52 m depths), and the deep-sea inhabiting *Paramunida travancorica* and *Munidopsis bhavasagara* obtained from the (275 m and 1221 m depths, respectively in the Southeastern Arabian Sea) and were described as new to science.
- A MoU was signed Indian Institute of Tropical Meteorology (IITM) with Amity University Mumbai (AUM). Through this MoU, one radar will be installed and operationalized at AUM campus in Panvel. The radar data sets will be used for teaching and research purposes by AUM faculty and students in collaboration with IITM scientists.
- A process for "Bioremediation of petroleum hydrocarbon and oil spill in marine environment by deep sea microbial consortia" was transferred to M/s Oil Spill Combat LLP, India, through National Research Development Corporation (NRDC) by National Institute of Ocean Technology (NIOT).

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)	*446 (805-359)	2	446
Automatic Rain Gauge (ARG)	570** (1382-812)	--	570
Agro AWS	200	--	197
GPS Sonde based RS/RW (Radio Sonde/ Radio Wind Stations)	56	--	56
Doppler Weather Radar (DWR)	*** 32	--	24
Ozone (Ozone Sonde + Total Ozone)	02	--	02
Surface Ozone (Electrochemical Concentration Cell method)	07	--	05
Nephelometer	12	--	09
Sky Radiometer	20	--	16
Black Carbon Monitoring Systems (Aethalometer)	25	--	15
System of Air Quality Monitoring System (SAFAR)	10 (Delhi) 10 (Mumbai) 10 (Ahmedabad)	--	10(Delhi) NIL(Mumbai)**** 10(Ahmedabad)
Hydromet (Indian Meteorological Department (IMD)& Extra-departmental excluding AWS &ARG)	---	--	3064
Aviation	79	--	79
Radiation Stations	46	---	46

\* Out of Total 805, 359 are outlived.

\*\* Out of total 1382, 812 are outlived.

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

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

## Modelling

During September 2022, 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 DRDO and IAF for use at their end.

## Monthly Weather Summary (September 2022)

### a) Important Weather Events during the month

#### Low Pressure Systems:

Under the influence of a cyclonic circulation over east central Bay of Bengal (BoB), a low pressure area formed over west central and adjoining east central BoB on 8th September. The system caused fairly widespread to widespread rainfall activity over Gangetic West Bengal, Odisha, Chhattisgarh, coastal Andhra Pradesh, Bihar, Jharkhand, Madhya Pradesh, Uttar Pradesh and East Rajasthan during its life period.

Three low pressure systems had formed; two systems over the Bay of Bengal and one over the land. Out of these, one system intensified into Depression during 11-12 September 2022. The low pressure systems and their remnants sustained over the land for longer duration and thus supported the persistent rainfall activity over Northwest and Central India during the month.

**Western Disturbances:**

Five Western Disturbances had affected Northwest India during the month; interaction of the Western Disturbances with the Low pressure areas and their remnants had caused intense rainfall activity over Northwest India and adjoining areas of Central India; re-curvature of the low pressure systems and their remnants under the influence of passing Western Disturbances had caused frequent spells of rainfall activity over of Uttar Pradesh, Bihar, Jharkhand and Gangetic West Bengal causing reduction in seasonal rainfall deficiency over these areas.

**b) Rainfall Scenario:** The rainfall for the country as a whole, for the month of September-2022 has been recorded as 181.3 mm which is 108% of 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): 330
	Percentage correct (in %) for Rainfall >64.4mm
Day1 / 24 Hours	77
Day2 / 48 Hours	75
Day3 / 72 Hours	75

**d) Temperature Scenario:** The mean temperature for the month of September-2022 for the country as a whole was 27.84°C which was above normal by +0.53°C. The highest temperature of 41.6°C had been recorded at Phalodi (West Rajasthan) on 10th September 2022 and the lowest temperature of 16.6°C had been recorded at Tiruppattur (Tamil Nadu, Puducherry & Karaikkal) on 1st September 2022 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	TS Days	Hail Events	Squall Events	Dust storms
1.	South Peninsular India	29	Nil	Nil	Nil
2.	Northwest India	29	Nil	Nil	Nil
3.	Northeast India	30	Nil	Nil	Nil
4.	East India	30	Nil	Nil	Nil
5.	Central India	29	Nil	Nil	Nil
6.	West India	10	Nil	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:- 5, Special Daily Weather Report for Southwest Monsoon 2022:- 30, Current Weather Status & Outlook for next two weeks:- 5, Extended Range Outlook for cyclo

genesis:- 5, Tropical weather outlook:- 29, Special tropical weather outlook:- 3, National bulletin:- 7, Mountain weather bulletins issued for western and central Himalayan region:- 60, Expedition forecast bulletin issued for Indian Army (AAW) during expedition to Mt. Kamet peak:- 17, Expedition forecast bulletin issued for Indian Army during trekking expedition to Parvati Valley:- 10, Expedition forecast bulletin issued for SSB during expedition to Mt. Thelu:- 2, expedition forecast bulletin issued for NIMAS during expedition to Mt. Gorichen: 3, Marine Weather Bulletins:- 60, Nowcast Guidance Bulletins for Severe Weather:- 30, Press Releases issued during the month:- 39.

### Publications & Operational Reports:

1. Monthly and cumulative Standardized Precipitation Index (SPI) maps were prepared for the month ending August 2022 for use in Climate Diagnostic Bulletin of India. The same have also been uploaded in IMD Pune website.
2. Four weekly and cumulative Standardized Precipitation Index (SPI) maps were prepared for the weeks ending 07.09.2022, 14.09.2022, 21.09.2022 and 28.09.2022 and supplied for use in Agromet Advisory Services Bulletin. The same have also been uploaded in IMD Pune website.
3. Computed gridded SPI & SPEI at 0.5\*0.5 degree resolution at 4 weekly, 1, 2, 3, & 4 monthly time scales. Uploaded the maps of the aforementioned timescales at weekly basis on IMD Pune website.
4. Five weekly Aridity Anomaly Maps for the period 25 August to 31 August, 01 to 07, 08 to 14, 15 to 21 and 22 to 28 September 2022 have been prepared, mailed to Agrimet for Agromet Advisory Services and uploaded on IMD Website.
5. Five Biweekly Aridity Anomaly Maps for the period 18 August to 31 August, 25 August to 07 September, 01 to 14, 08 to 21 and 15 to 28 September 2022 have been prepared and uploaded on IMD Website.
6. Five weekly Aridity Anomaly Outlook Maps for the period 01 to 07, 08 to 14, 15 to 21, 22 to 28 and 29 September to 05 October 2022 have been prepared and uploaded on IMD Website.
7. Monthly Aridity Anomaly Maps for the period August and June to August Cumulative 2022 have been prepared and uploaded on IMD Web-site.
8. Climate Diagnostic Bulletin for February, March and April 2022 have been published and uploaded on the website.

### Seismological Observational Network

Observation Type	Target	Commissioned so far	Data reporting during the month
Seismic stations	115	152	122

### Earthquake and Tsunami monitoring

Earthquake: 116 earthquakes were monitored in the Indian region out of which 6 event were greater than the magnitude (M) of 5.0.

Tsunami: 8 seabed earthquakes (M>6) with a potential to generate tsunami have occurred. These informations were provided in less than 12 minutes of occurrence of the events.

### Ocean Observation System

Type of Platform	Target	Commissioned till September, 2022	Data received during September, 2022
Argo Floats *	200	374	57
Moored Buoys	16	19	11
Tide Gauges	36	36	32

High Frequency (HF) Radars	10	12	6
Acoustic Doppler Current Profiler (ADCP)	20	20	17
Tsunami Buoys	4	7	3
Wave Rider Buoy	23	16	11

\*The remaining floats/ drifters have completed their life time and as such no data can be received from them.

### **Ocean Science Services**

No	Types of forecasts	No. of advisories issued during the month
1.	Integrated Potential Fishing Zone (PFZ) advisories (Sea Surface Temperature (SST), Chlorophyll., wind)	30
2.	Tuna Fishing Advisories	3
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**

- National Tsunami Evacuation Planning (TEP) Workshop conducted at INCOIS on 13 Sept 2022 as part of UNESCO - Intergovernmental Oceanographic Commission - United Nations ESCAP project for North West Indian Ocean. TEP Working Group members, Disaster Management Organisation (DMO), and Indian Ocean Tsunami Warning and Mitigation System (IOTWMS) delegates participated in the hybrid mode workshop to discuss the implementation of the Tsunami Ready Programme.
- A training course on “Fundamentals of Remote Sensing & its Oceanographic Applications” was organized by ITCOcean/INCOIS, Hyderabad from 05-09 September 2022. In total 206 participants attended the training programme. The trainees have been exposed to ocean colour remote sensing & its applications, quantify the ocean parameters with appropriate algorithms & illustrate various oceanographic applications.
- As part of the Ministry’s campaign on “Swachh Sagar -Surakshit Sagar”, various activities were conducted throughout the month of September. The "Swachh Sagar, Surakshit Sagar/Clean Coast Safe Sea” campaign is a 75-day citizen-led campaign for improving ocean health through collective action. The campaign started on 05 July 2022 and ended on 17th September 2022. The campaign ended with the largest beach cleaning event on Sept 17, 2022 (International Coastal Cleanup Day) covering 75 beaches across India’s 7500+ km coastline. A mobile app “Eco Mitram” was launched to spread awareness about the campaign and also for the common people to voluntary registration for the beach cleaning activity on the 17th of September 2022. This campaign was spearheaded by the Ministry of Earth Sciences (MoES) along with the Indian Coast Guard, Ministry of Science & Technology, Department of Atomic energy, Department of Space, National Service Scheme (NSS), Paryavaran Sanrakshan Gatividhi, Seema Jagran Manch along with various Departments/Ministries of center and state governments, non-government organizations and educational institutions.
- Based on the request from the Indian Coast Guard, the Search and Rescue Aid Tool (SARAT) advisory provided by INCOIS for a Merchant vessel Kymea collided with capsized floating barge on 12 September 2022.

- INCOIS provided weekly updates including past week briefing and upcoming week forecast of Ocean State Forecast information (Wave, Wind, Current, Swell, Sea Surface Temperature) for the Indian Ocean to South Asia Hydromet Forum (SAHF). Twelve (12) High wave/ Swell surges (Alert/ Warning) were issued for the East Coast of India and Andaman and Nicobar.
- NCCR developed an IOS and Android app SS SAGAR and WebGIS Dashboard for in connection with the International Coastal Cleanup Day and Data on Marine Litter was collected from about 75 beaches from the East and West Coast of India.
- NCMRWF hosted one-day visit of “Air Warriors of IAF” to NCMRWF, Noida on 22<sup>nd</sup> Sept 2022.
- NCMRWF hosted annual meeting of "Town Official Language Implementation Committee" on 7<sup>th</sup> Sept 2022 from 3:00 pm to 6:00 pm in auditorium. The Secretary of the Ministry of Ports, Shipping and Waterways was the Chief Guest. Directors of all (total 44) government offices in Noida along with NCMRWF Hindi Committee members participated in the meeting.
- IITM, Pune conducted a national training workshop on fundamentals of Data Assimilation (NTDA) during 09-21 Sept 2022. About 50 participants attended the training workshop.
- IITM, Pune is celebrating 'Azadi Ka Amrit Mahotsav' and as part of the celebrations, virtual lecture series were organized at IITM during the month.
- IITM, Pune celebrated Environment Awareness Event of "World Ozone Day" on 16 September 2022.
- NIOT conducted an Indo French workshop on 'Ocean Technologies towards advanced knowledge and sustainable development' during Sea Tech week September 26-30, 2022 at Brest, France.
- 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, 2022 – August, 2022	September, 2022	Total	April, 2022 – August, 2022	September, 2022	Total
Atmospheric Sciences	73	11	84	9	2	11
Ocean Science and Technology	37	5	42	1	-	1
Polar Sciences	17	1	18	-	-	-
Geosciences and resources	29	6	35	1	-	1
Total	156	23	179	11	2	13

## **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 Cruise</b>
Sagar Nidhi	22	8	1
Sagar Manjusha	9	21	1
Sagar Tara	17	13	2
Sagar Anveshika	15	15	2
Sagar Kanya	0	30	0
Sagar Sampada	0	30	0



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

Prithvi Bhavan, Lodhi Road  
New Delhi-110 003

Dated, the October, 2022

CERTIFICATE

(FOR THE MONTH OF SEPTEMBER, 2022)

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, 2022. 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	- 10
c. Number of posts totally vacant as on date	- 02
d. Number of posts under additional charge arrangement	- 01
e. Number of posts that would fall vacant during the next 6 months	- 00



(D Senthil Pandiyan)  
Joint Secretary  
js@moes.gov.in