

# Ministry of Earth Sciences (MoES)

## Summary of Important Developments – April, 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:** Discussed internally within MoES and directors of MoES autonomous institutions (ABs), and arrived a new proposal to merge all 5 ABs under one society. All existing ABs will function under one society. A draft Cabinet note has been prepared and will be circulated for Inter-Ministerial consultations.
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 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.

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### Important policy decision taken and major achievements:

- IMD issued 1<sup>st</sup> stage Long Range Forecast of Monsoon Season rainfall on 14<sup>th</sup> April, 2022. Southwest monsoon seasonal (June to September) rainfall over the country as a whole is most likely to be normal (96 to 104 % of Long Period Average (LPA)). Quantitatively, the monsoon seasonal (June to September) rainfall is likely to be 99% of the Long Period Average (LPA) with a model error of  $\pm 5\%$ . The LPA of the season rainfall over the country as a whole for the period 1971-2020 is 87 cm.
- IMD issued new Normals of Monsoon Season Rainfall based on data of 1971-2020 from 4132 rain gauge stations well distributed over the country representing 703 districts of India. The New All-India rainfall normal for the southwest monsoon season (June-September) is 868.6 mm. It will replace the earlier normal of 880.6 mm based on data of 1961-2010. The New All-India annual rainfall normal is 1160.1 mm compared to earlier normal of 1176.9mm based on data of 1961-2010.
- The Antarctic expedition vessel having sailed from the Indian Barrier on 26 March 2022 with 27 members, reached Cape Town, South Africa on 4 April 2022.
- As part of the Establishment of Ocean thermal energy conversion (OTEC) powered desalination plant at Kavaratti, a ceremonial event to commence the project activities at site was held on 31<sup>st</sup> March 2022 in presence of Hon'ble Administrator of Union Territory (UT) Lakshadweep.
- India Meteorological Department (IMD) is one of six Regional Specialised Meteorological Centres (RSMCs) in the world recognised by the World Meteorological Organisation (WMO) under a global system for issue of warnings and advisories in association with cyclonic disturbances over north Indian Ocean.
- The rainfall in May 2022 averaged over the country is most likely to be above normal (>109% of Long Period Average (LPA)).
- During May, above normal maximum temperatures are likely over most parts of the west central and northwest India, and northern parts of northeast India.
- National Centre for Medium Range Weather Forecasting (NCMRWF) signed Memorandum of Understanding (MoU) with 'Karnataka State Natural Disaster Monitoring Centre' (KSNDMC), Bengaluru on 5<sup>th</sup> April 2022 and with Gautam Budha Univeristy (GBU), Greater Noida on 30<sup>th</sup> April 2022.

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 28.78 million farmers in the country are getting advisories through SMS 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**

<b>Observation Type</b>	<b>Commissioned so far</b>	<b>Installations during the month</b>	<b>Data Reporting</b>
Automatic Weather Station (AWS)	*358 (727-369)	--	358
Automatic Rain Gauge (ARG)	578** (1382-804)	--	578
Agro AWS	200	02	194
GPS Sonde based RS/RW (Radio Sonde/ Radio Wind Stations)	56	--	56
Doppler Weather Radar (DWR)	*** 32	--	26
Ozone (Ozone Sonde + Total Ozone)	04	--	04
Surface Ozone (Electrochemical Concentration Cell method)	07	--	07
Nephelometer	12	--	12
Sky Radiometer	20	--	13
Black Carbon Monitoring Systems (Aethalometer)	25	--	23
System of Air Quality Monitoring System (SAFAR)	10 (Delhi) 10 (Mumbai) 10 (Ahmedabad)	--	09(Delhi) NIL(Mumbai)**** Nil(Ahmedabad)
Hydromet (Indian Meteorological Department (IMD)& Extra-departmental excluding AWS & ARG)	---	--	3144
Aviation	79	--	79
Radiation Stations	46	---	46

\*Out of Total 727, 369 are outlived.

\*\* Out of total 1382, 804 are outlived.

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

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

### **Modelling**

During April 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) Snow and Avalanche Study Establishment (SASE), (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 SASE/ DRDO an IAF for use at their end.

### Monthly Weather Summary (April 2022)

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

**Low Pressure Systems:** A total of 6 number of Western Disturbances (1-4, 7-9, 13-15, 20-22, 23-25 and 28-29 April) affected north India, most were feeble and dry. Two cyclonic circulations moved from southwest Bay of Bengal to Southeast Arabian Sea and adjoining Kerala coast during week ending on 13 and 21<sup>st</sup> April. Under the influence of cyclonic circulations/ troughs in lower tropospheric levels supported by moisture incursion into the area had caused fairly widespread to widespread rainfall/ thunderstorm activity over Sub Himalayan West Bengal & Sikkim and over Northeast India.

**Heat wave to severe heat wave conditions** had occurred at Rajasthan, Haryana, Chandigarh & Delhi, Punjab, Himachal Pradesh and Jammu Division of Jammu Kashmir & Ladakh, Madhya Pradesh, Uttar Pradesh, Saurashtra & Kutch, Jharkhand, Vidarbha, Gujarat, Bihar and Gangetic West Bengal, Odisha and Maharashtra.

**b) Rainfall Scenario:** The rainfall for the country as a whole, for the month of April 2022 has been recorded as 38.4 mm which is 98% of its Long Period Average (LPA) of 39.3 mm.

#### c) Heavy Rainfall Events:

Warning issued for	No. of Heavy/Very Heavy Rainfall Events (>64.4 mm): 19
	Percentage correct (in %) for Rainfall >64.4mm
Day1 / 24 Hours	94
Day2 / 48 Hours	95
Day3 / 72 Hours	95

**d) Temperature Scenario:** The mean temperature for the month of April-2022 for the country as a whole was 29.40°C which was above normal by +1.36°C. The maximum temperature of 47.4°C had been recorded at Banda (East Uttar Pradesh) on 29th April 2022 and the minimum temperature of 12.5°C had been recorded at Jhansi (West Uttar Pradesh) on 5th April 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.	State/ UT	Thunderstorm Events	Hail Events	Dust storms	Gusty Winds
1	Andaman & Nicobar Islands	0	0	0	0
2	Andhra Pradesh	3	1	1	1
3	Arunachal Pradesh	0	0	0	0
4	Assam	5	2	0	0
5	Bihar	3	2	5	4
6	Chandigarh	0	0	0	0
7	Chhattisgarh	1	0	0	1
8	Dadar and Nagar Haveli	0	0	0	0

S. No.	State/ UT	Thunderstorm Events	Hail Events	Dust storms	Gusty Winds
9	Delhi	2	1	5	3
10	Goa	5	4	1	3
11	Gujarat	0	0	0	0
12	Haryana	4	1	6	4
13	Himachal Pradesh	0	0	0	0
14	J & K	0	0	0	0
15	Jharkhand	2	1	1	1
16	Karnataka	4	2	1	2
17	Kerala	21	1	0	15
18	Ladakh	0	0	0	0
19	Lakshdweep Islands	0	0	0	0
20	Madhya Pradesh	0	0	0	2
21	Maharashtra	14	4	1	4
22	Manipur	1	0	0	0
23	Meghalaya	3	1	0	0
24	Mizoram	0	0	0	0
25	Nagaland	0	0	0	1
26	Odisha	3	1	1	3
27	Puducherry	0	0	0	0
28	Punjab	7	2	2	3
29	Rajasthan	1	1	3	0
30	Sikkim	0	0	0	0
31	Tamilnadu	9	2	3	4
32	Telangana	1	0	0	0
33	Tripura	1	1	0	1
34	Uttar Pradesh	1	3	6	2
35	Uttarakhand	1	1	0	0
36	West Bengal	12	5	2	6

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

All India Weather Bulletins:-120, All India inference and severe weather warnings:-120, All India Weekly Weather Reports:-4, Current Weather Status & Outlook for next two weeks:- 4, Mountain weather bulletins issued for western and central Himalayan region:-60, Heat wave warning bulletin issued for India- 30, Marine Weather Bulletins:-60, Forecast Demonstration Project (FDP) Thunderstorm Observation and Regional Modelling (STORM) Bulletins issued -30, Nowcast Guidance Bulletins for Severe Weather:-30, Press Releases issued during the month:-26.

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

- i) El Niño-Southern Oscillation (ENSO) bulletin for the month of April 2022” and Seasonal Climate Outlook for South Asia for the period of April to July 2022 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) )
- ii) Computed gridded Standardized Precipitation Index (SPI) & Standardized Precipitation Evapotranspiration Index (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.
- iii) Four weekly Aridity Anomaly Maps for the period 31 March to 06 April, 07 to 13, 14 to 20 and 21 to 27 April 2022 have been prepared and uploaded on IMD Website.

- iv) Four weekly and cumulative Standardized Precipitation Index (SPI) maps were prepared for the weeks ending 06.04.2022, 13.04.2022, 20.04.2022 and 27.04.2022 and supplied for use in Agromet Advisory Services Bulletin. The same also been uploaded in IMD Pune website.
- v) Four Biweekly Aridity Anomaly Maps for the period 24 March to 06 April, 31 March to 13 April, 07 to 20 and 14 to 27 April 2022 have been prepared and uploaded on IMD Website.
- vi) Four weekly Aridity Anomaly Outlook Maps for the period 07 to 13, 14 to 20, 21 to 27 and 28 April to 04 May 2022 have been prepared and uploaded on IMD Website.
- vii) The monthly and cumulative Standardized Precipitation Index (SPI) maps were prepared for the month ending March 2022 for use in Climate Diagnostic Bulletin of India. The same have also been uploaded in IMD Pune website.
- viii) Four weekly Aridity Anomaly Maps for the period 31 March to 06 April, 07 to 13, 14 to 20 and 21 to 27 April 2022 have been prepared and mailed to Agromet for Agromet Advisory Services.

### Seismological Observational Network

Observation Type	Target	Commissioned so far	Data reporting during the month
Seismic stations	115	152	139

### Earthquake and Tsunami monitoring

**Earthquake:** 81 earthquakes were monitored in the Indian region out of which 9 events were greater than the magnitude (M) of 5.0.

**Tsunami:** 1 seabed earthquake (M> 6) with a potential to generate tsunami occurred. This information was provided in less than 12 minutes of occurrence of the event.

### Ocean Observation System

Type of Platform	Target	Commissioned till April, 2022	Data received during April, 2022
Argo Floats *	200	374	69
Moored Buoys	16	19	13
Tide Gauges	36	36	31
High Frequency (HF) Radars	10	12	10
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	9
3.	Ocean State Forecast (OSF)-Wave, Wind, Currents, SST (Sea Surface Temperature), MLD (Mixed Layer Depth) and D20 forecasts	30
4.	Real time global ocean analysis (daily)	30

5.	Coral Bleaching Alert System	10
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### **Outreach and Awareness**

- A workshop on ‘Sustenance of Ocean Moored buoy Network in Northern Indian Ocean’ at National Institute of Ocean Technology (NIOT) on March 29, 2022.
- As an international commitment, Tropical Cyclone (TC) advisories are issued by Regional Specialised Meteorological Centre (RSMC), New Delhi, to 13 WMO/ Economic and Social Commission for Asia and Pacific (ESCAP) Panel member countries including Bangladesh, India, Iran, Maldives, Myanmar, Pakistan, Qatar, Saudi Arabia, Sultanate of Oman, Sri Lanka, Thailand, United Arab Emirates and Yemen.
- 18<sup>th</sup> Tropical Cyclones Forecasters Training 2022 was conducted by Regional Specialised Meteorological Centre (RSMC), New Delhi during 4<sup>th</sup> – 14<sup>th</sup> April through online mode. 65 participants including 15 from WMO/ESCAP Panel member countries participated.
- IMD organised media briefing on 1<sup>st</sup> stage Long Range Forecast of Monsoon Season rainfall on 14<sup>th</sup> April, 2022 (online mode) under the Chairmanship of Dr. M. Ravichandran, Secretary, MoES.
- IMD issued a press release on New Normal’s of Monsoon Season Rainfall based on data during 1971-2020.
- IMD organized Press Conference on “Monthly Outlook for Temperature and Rainfall during May, 2022” on 30<sup>th</sup> April.
- 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.
- 54 students from Prince Shree Venkateswara Padmavathy Engineering College and 150 students from Indian Institute of Technology Madras visited NIOT facilities on 8<sup>th</sup> & 19<sup>th</sup> April 2022.
- 77 students from Jain (Deemed-to-be University), Kochi Campus and Smt. Durgabai Deshmukh Women’s Govt. Tech. Training Inst., Hyderabad visited Indian National Centre for Ocean Information Services (INCOIS) campus on 4<sup>th</sup> April. They have been guided tour through our lab facilities and briefed about the services provided by INCOIS.
- A group of 25 students from Centre for Earth, Ocean and Atmospheric Sciences (CEOAS), University of Hyderabad visited INCOIS on 21<sup>st</sup> April 2022 as a part of their academic programme to familiarize themselves with the equipment used for ocean observations, and also the operational services at the INCOIS.
- Indian Institute of Tropical Meteorology (IITM), Pune is celebrating 'Azadi Ka Amrit Mahotsav' and as part of the celebrations, virtual lecture series and national science day activities were organized at IITM during April 2022.

### **Publications**

Subject	Publications			Ph.Ds		
	April, 2021 – March 2022	April, 2022	Total	April, 2021 – March 2022	April, 2022	Total
Atmospheric Sciences	225	18	243	9	-	9
Ocean Science and Technology	113	9	122	4	-	4
Polar Sciences	52	4	56	1	-	1
Geosciences and resources	114	6	120	3	-	3
Total	504	37	541	17	-	17

**Patents: 1**

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

Vessel	Days at Sea / Utilization	Maintenance/ Inspection /Scientific Logistics / Cruise Preparation	No. of Cruise
Sagar Nidhi	0	30	0
Sagar Manjusha	0	30	0
Sagar Tara	0	30	0
Sagar Anveshika	26	4	4
Sagar Kanya	0	30	0
Sagar Sampada	0	30	0



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

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Dated, the 18 May, 2022

CERTIFICATE

(FOR THE MONTH OF APRIL, 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 April, 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                       | - 01 |
| d. Number of posts under additional charge arrangement             | - 02 |
| e. Number of posts that would fall vacant during the next 6 months | - 01 |

  
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