

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

As a part of Special Campaign 3.0, various activities were carried out under Swachhta Abhiyan during the month of October 2023 in MoES and its institutes.

6. Status of Rationalization of Autonomous Bodies:

The Cabinet in its meeting on 13th July 2022 approved the merging of 5 Autonomous Bodies under MoES to one Autonomous Body. Application for registration of Umbrella Autonomous Society 'Earth System Science Council' in Delhi was filed with Registrar of Societies, Delhi.

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.

Important policy decision taken and major achievements:

- The Hon'ble Union Minister of Earth Sciences, Shri Kiren Rijju visited High Altitude Cloud Physics Laboratory (HACPL) at Mahabaleshwar on 5th October 2023 to review the ongoing observational research activities at the lab.
- The 43rd Indian Scientific Expedition to Antarctica is launched with the first batch of 19 members travelling to antarctica during the month.
- Indian Institute of Tropical Meteorology (IITM), Pune, erected a 10-meter-high Micrometeorological tower at Sanjay Ghodawat University, Kolhapur and several Compact weather sensors have been installed at 2 meter and 6-meter height respectively to study the surface layer characteristics and turbulence under the Thunderstorm Dynamics Project.
- A MoU was signed between IITM and Armament Research and Development Establishment (ARDE), Pune on 9th October 2023 for collaboration and utilization of weather forecast for defense applications.
- India Meteorological Department (IMD) released Long Range Forecast of rainfall and temperature for the month of November 2023 with the following highlights:
 1. Monthly rainfall over the country as a whole during the November 2023 is most likely to be normal (77-123 % of LPA).
 2. Above-normal maximum temperatures are likely over most parts of the country, except for some parts of Northwest India and Central India, where normal maximum temperatures are likely.
 3. Currently moderate El Niño conditions are prevailing over Equatorial Pacific Ocean and positive Indian Ocean Dipole (IOD) conditions are prevailing over the Indian Ocean.
 4. As the changes in the Sea Surface Temperature (SST) conditions over the Pacific and the Indian Oceans are known to influence the Indian climate, IMD/ MoES is carefully monitoring the evolution of sea surface conditions over these Ocean basins.
- The October issue of the Newsletter from the National Portal of India has listed National Centre for Medium Range Weather Forecasting (NCMRWF) website as among the "Most viewed on National Portal".

- The Norwegian Ambassador to India, along with a delegation from Norway visited the National Institute of Ocean Technology (NIOT) on October 31, 2023, and engaged in discussions with scientists from NIOT to explore opportunities for further collaboration between India and Norway.
- Delegates from the Ministry of Natural Resources and Environment and the Northern Center for Planning and Investigation of Marine Resources - Environment (CPIM), Vietnam visited National Centre for Coastal Research (NCCR) from 9-12 October 2023.

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)	*497	--	497
Automatic Rain Gauge (ARG)	**444	--	444
Agro AWS	200	--	190
GPS Sonde based RS/RWStns.	56	--	56
Doppler Weather Radar (DWR)	***41	--	32

Observation Type	Commissioned so far	Installations during the month	Data Reporting
Ozone (Ozone Sonde + Total Ozone)	02	--	02
Surface Ozone (Electrochemical Concentration Cell method)	07	--	05
Nephelometer	12	--	09
Sky Radiometer	20	--	13
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)	---	--	3139
Aviation	100	--	100
Radiation Stations	47	---	47

* Out of Total 808 commissioned, 311 are outlived.

** Out of total 1382 commissioned, 938 are outlived.

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

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

Modelling

During October 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 26th October 2023 the monthly mean forecast valid for November 2023 were also included for the users.

Monthly Weather Summary (October 2023)

a) Important Weather Events during the month

Low Pressure Systems:

Southwest monsoon (SW) Monsoon withdrew from entire country on 19th October against the normal date of 15th October 2023 and commencement of Northeast Monsoon over South Peninsula on 21st October against the normal of 20th October 2023. A total of four Low pressure systems (LPS) with 21 days were observed over Indian region. 7 number of Western Disturbances (WD) (1-5 Oct, 8-17 Oct, 13-17 Oct, 15-19 Oct, 20-24 Oct, 24-27 Oct and 28-30 Oct 2023) moved across extreme north of India except only 1 WD during 15-17 Oct caused rain/ snow over North India. Twin-low pressure systems observed over the Indian Region-One during 1st week and then in 4th Week of the month. Extremely Severe Cyclonic Storm “TEJ” during 18-24 Oct 2023 over Arabian Sea which crossed Yemen coast close to south of Al Ghaidah as a very severe cyclonic storm and Very Severe Cyclonic Storm “Hamoon” during 19-25 Oct 2023 over Bay of Bengal which crossed Bangladesh coast to the south of Chittagong as a Cyclonic Storm. In terms of rainfall their impacts, Tej caused heavy to very heavy rainfall over West coast as well as over east central and adjoining parts of east and northeast India respectively while Hamoon had not much impact over India.

b) Rainfall Scenario:

The rainfall for the country as a whole, for the month of October-2023 has been recorded as 50.8 mm which is -32.6% of its Long Period Average (LPA) of 75.4 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	91

Day2 / 48 Hours	91
Day3 / 72 Hours	91

d) Temperature Scenario:

The mean temperature for the month of October 2023 for the country as a whole was 32.130C which was above normal by +0.960C. All India averaged Maximum Temperature for October is third highest and Mean Temperature is fifth highest since 1901. The maximum temperature of 40.4oC had been recorded at Jaisalmer (West Rajasthan) on 4th October 2023 and the minimum temperature of 10.9oC had been recorded at Jalgaon (Madhya Maharashtra) on 28th October 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:

S. No.	Region	Thunder Storm Days	Hail Events	Squall Events	Dust storms
1.	South Peninsular India	26	Nil	Nil	Nil
2.	Northwest India	13	1 (Sunder Nagar (HP) on 23 October)	Nil	Nil
3.	Northeast India	16	Nil	Nil	Nil
4.	East India	21	Nil	Nil	Nil
5.	Central India	07	Nil	Nil	Nil
6.	West India	05	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: 25, Daily Severe Weather Guidance for next 5 days under Severe Weather Forecasting Programme: 25, Weekly Extended Range Outlook for Cyclogenesis for next 2 weeks: 4, Daily Warnings for Fishermen in North Indian Ocean for next 5 days including the advisories from sub-offices of IMD (6 hourly): 100, Fleet Forecast for Indian Navy for next 12 hours: 50, Bulletins for ships

in deep sea under Global Maritime Distress Safety System for next 36 hours: 50, Bulletins for offshore & onshore industries: 16, Severe Weather Advisory Bulletins for nowcast guidance: 31, Mountain weather bulletins issued for western and central Himalayan region:- 62, Mountain Expedition Forecast Bulletins issued for Expedition Forecast bulletins issued for Mt Kangto-6 Mountaineering Expedition by Army Adventure wing- 5. Expedition Forecast bulletins issued for Mt. Nun Mountaineering Expedition by Army Adventure wing- 15. Expedition Forecast bulletins issued for Mt. Kun Mountaineering Expedition by High Altitude Warfare- 5. Expedition Forecast bulletins issued for Mt. Jongsong Mountaineering Expedition by National Institute of Mountaineering and Adventure Sports (NIMAS) - 4. Expedition Forecast bulletins issued for Mt. Jogin Mountaineering Expedition by Jammu and Kashmir Rifles (JAK RIF) - 12. Expedition Forecast bulletins issued for Mt. Bhagirathi-II Mountaineering Expedition by International Mountain Summit (IMS) - 3. Expedition Forecast bulletins issued for Sar Pass Parvati Valley Expedition by 5 Armored Regiment of Indian Army- 9. Expedition Forecast bulletins issued for Mt. Manaslu Mountaineering Expedition by Border Security Force (BSF) - 14. Expedition Forecast bulletins issued for Mt. Trishul Mountaineering Expedition conducted by Kumaon regiment- 2. Expedition Forecast bulletins issued for Mt. Bandarpunch I Mountaineering Expedition by State Disaster Response Force (SDRF) Uttarakhand- 1. Current Temperature Status and Heat Wave Warning bulletins: -31. Press Releases issued during the month: - 44.

Publications & Operational Reports:

1. Climate Summary for the month of September 2023 Issued.
2. El Nino Southern Oscillation (ENSO) bulletin for the month of October 2023 and Seasonal Climate Outlook for South Asia for the period of October to January 2024 were issued. Quick Link:
<https://imd pune.gov.in/cmpg/Product/ENSO Bulletin/ENSO IOD Update Bulletin 10 23.pdf>
3. Digital Current Weather Indication System (DCWIS) and Present Weather Detector (PWD) systems were installed at Ayodhya airport (Runway (RWY) 11) during 17.10.2023 to 23.10.2023.
4. DCWIS and PWD systems were installed at Bengaluru airport (RWYs 09R, 09R MID 27L, 27L MID) during 16.09.2023 to 24.09.2023.

Seismological Observational Network:

Observation Type	Commissioned so far	Data reporting during the month
Seismic stations	153	122

Earthquake and Tsunami monitoring

Earthquake:

221 earthquakes were monitored in the Indian region out of which 14 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. The information was disseminated in less than 12 minutes of occurrence of the events.

Ocean Observation System

Type of Platform	Commissioned till during the month	Data received during the month
Argo Floats	92	51
Moored Buoys	19	19
Tide Gauges	36	33
High Frequency (HF) Radars	10	7
Acoustic Doppler Current Profiler (ADCP)	20	17
Tsunami Buoys	7	5
Wave Rider Buoy	16	10

Ocean Science Services

S. 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	12
3.	Ocean State Forecast (OSF)-Wave, Wind,	30

S. No.	Types of forecasts	No. of advisories issued during the month
	Currents, SST (Sea Surface Temperature), MLD (Mixed Layer Depth) and D20 forecasts	
4.	Real time global ocean analysis (daily)	30
5.	Coral Bleaching Alert System	10

Outreach and Awareness

- As part of various activities initiated to commemorate 50th year of formation of Panel on Tropical Cyclones (PTC) and Regional Specialised Meteorological Centre, New Delhi (RSMC), Cyclone Warning Division, India Meteorological Department (IMD) organised the following lectures online:
 - Lecture by Director General, Bangladesh Meteorological Department on 9th October 2023.
 - Lecture by Director General, Pakistan Meteorological Department on 16th October 2023.
 - Lecture by representative of Director General, Iran Meteorological Organisation, Dr. Behzad Layeghi on 30th October 2023.
- The following Training/ Lectures/ workshops have conducted by IMD:
 - Climate Services User Forum (CSUF) of South Asian Climate Outlook Forum (SASCOF) -26 conducted on 3.10.2023.
 - Climate Services User Forum (CSUF) through virtual mode conducted by IMD, Pune in collaboration with Regional Integrated Multi-Hazard Early Warning System for Africa and Asia (RIMES) and UK Met office on 03.10.2023.
 - The Office of Climate Research and Services (CRS) organized a "Stakeholder Consultation Workshop for the Development of National Framework for Climate Services in India (NFCS-India)" at Lavasa, Pune during 5-6 October 2023.
- 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.).

- The forecast videos in regional language were issued by regional offices of IMD regularly.
- Daily interview was provided by the forecasters within the country.
- Bulletins and Warnings along with graphics were also communicated through social media including Facebook, Twitter, Instagram, YouTube and IMD Blog page.
- As a part of Special Campaign 3.0, various activities were carried out under Swachhta Abhiyan during the month of October 2023 in MoES and its institutes.
- Students from various colleges/ institutes/ universities/ schools visited Indian National Centre for Ocean Information Services (INCOIS) and Indian Institute of Tropical Meteorology (IITM).
- A beach cleanup activity was carried out by NCCR, Chennai at Ashtalakshmi temple beach at Besant Nagar Chennai during Swacchata Hi Seva on 1 October 2023.
- Indian Ocean-wide Tsunami Exercise called Indian Ocean Wave (IOWave)-23 conducted by the Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWMS) of Intergovernmental Oceanographic Commission-United Nations Educational, Scientific and Cultural Organization (IOC-UNESCO) on 4th, 11th, 18th, 25th October 2023. As a Tsunami Service Provider (TSP), Indian Tsunami Early Warning Centre (ITEWC), INCOIS issued test bulletins for the exercise scenarios to 25 Indian Ocean countries. India's disaster management officials and a few communities participated in a mock exercise on 4th October (coastal states/UTs of the east coast of India) and 11th October (coastal states/UTs of the west coast of India). During the exercise, over 40,000 people from 42 coastal villages of the east coast of India of Tamil Nadu, Odisha, Puducherry, and Andaman Islands participated and were evacuated to safe shelters.
- The following training/ workshops were conducted by INCOIS:
 - On October 4, INCOIS hosted a user interaction workshop for Matshyakara Samkshema Samiti (MSS) coordinators and representatives from the Andhra Pradesh Fisheries Department. About 70 people, including fisherfolk and officials from Andhra Pradesh

Fisheries Department participated in the workshop. The User Interaction Workshop aimed to raise awareness on INCOIS services, including Potential Fishing Zone advisories, Tsunami Early Warning, High wave, Storm Surge, coral bleaching, and harmful algal bloom alerts, etc. The participants visited the various labs of INCOIS and engaged in discussions with the scientists.

- From Oct 9 to 11, INCOIS participated in the exhibition at the Annual Humanitarian Assistance & Disaster Relief exercise CHAKRAVAT hosted by the Indian Navy at Goa.
- From Oct 10 to 13, INCOIS participated in the 16th Agricultural Science Congress 2023 & Expo at Kochi.
- From Oct 17 to 18, INCOIS exhibited its services at the International Conclave on 'Mainstreaming Climate Change into International Fisheries Governance and Strengthening of Fisheries Management Measures in the Indo-Pacific Region' in Chennai.
- From Oct 17 to 19, INCOIS participated in the exhibition at the Global Maritime India Summit 2023 held in Mumbai.
- Two hundred and twenty-six (226) High wave/Swell Surge Alert/ Rough Sea Alert were issued to West and East Coast of India, Andaman & Nicobar Islands by INCOIS.
- 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 Indian Ocean to South Asia Hydromet Forum (SAHF) which is administrated by RIMES.
- Thirty (30) days of Algal Bloom Information Service were issued, and no alert was generated by INCOIS.

Publications

Subject	Publications			Ph.Ds.		
	Apr 2023 – Sep 2023	Oct 2023	Total	Apr 2023 – Sep 2023	Oct 2023	Total
Atmospheric Sciences	80	17	97	8	0	8
Ocean Science	51	15	66	2	0	2

and Technology						
Polar Sciences	14	4	18	0	0	0
Geosciences and resources	28	2	30	5	0	5
Total	173	38	211	15	0	15

Utilization of Ocean Research Vessels during the month

Vessel	Days at Sea/ Utilization	Maintenance/ Inspection/ Scientific Logistics/ Cruise Preparation	No. of Cruises
Sagar Nidhi	28	3	2
Sagar Manjusha	19	12	1
Sagar Tara	16	15	1
Sagar Anveshika	22	9	2
Sagar Kanya	0	31	0
Sagar Sampada	0	31	0


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भारत सरकार / Government of India
पृथ्वी विज्ञान मंत्रालय / Ministry of Earth Sciences

Prithvi Bhavan, Lodhi Road
New Delhi, the November 2023

**CERTIFICATE
(FOR THE MONTH OF OCTOBER, 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 October, 2023. A summary of the status is given below:-

Sr. No.	Details	Number
a.	Total number of posts required to be entered on AVMS	13
b.	Number of posts filled as on date	11 (including 01 Deputy Secretary appointed under Central Staffing Scheme)
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	01



(देवकी नंदन / Devaki Nandan)

उप सचिव, भारत सरकार / Deputy Secretary to the Govt. of India

Tele: 011-24669544

email: dn.saraswat@nic.in