

Ministry of Earth Sciences (MoES)

Govt. of India

Summary of Important Developments – February,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):

Routine cleaning of the campus.

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.

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 Secretary General of the International Seabed Authority (ISA), Mr. Michael W. Lodge visited MoES during February 2023. Secretary General, ISA and Secretary, MoES exchanged a five-year extension agreement for the exploration of Poly-Metallic Nodules (PMN) in the Central Indian Ocean Basin on 1st February 2023 in presence of Hon'ble Union Minister of State (Independent Charge) Earth Sciences.
- During the upcoming hot weather season (March to May (MAM)), above normal maximum temperatures are likely over most parts of northeast India, east and central India and some parts of northwest India. Normal to below normal maximum temperatures are most likely over remaining parts of the country; above normal minimum temperatures are very likely over most parts of the country except south peninsular India where normal to below normal minimum temperatures are likely.
- Enhanced probability of occurrence of Heat wave during March to May season is likely over many regions of Central and adjoining Northwest India. A low probability for occurrence of heatwave over Central India is likely during March 2023.
- The rainfall in March 2023 averaged over the country is most likely to be normal (83-117% of Long Period Average (LPA)). Below normal rainfall is most likely over most areas of northwest India, west central India and some parts of east & northeast India. Normal to above normal rainfall is likely over most parts of peninsular India, east central India and some isolated pockets of northeast India.
- Met service started for Shivamogga airport, Karnataka from 1200 UTC on 19th February 2023.
- National Centre for Coastal Research (NCCR) released the 'Digital Draft of Marine Spatial Planning for UT – Puducherry' in the august presence of Hon'ble LG and Chief Minister of Puducherry on 13 February 2023.
- NCCR released the 'Digital Draft of Marine Spatial Planning for UT – Lakshadweep' in the august presence of Principal Scientific Adviser to the

Government of India and HE Hans Jacob Frydenlund, Ambassador of Norway on 17 February 2023.

- NCCR released the "Shoreline change atlas for UT Lakshadweep" by Administrator of UT Lakshadweep on 17 February 2023.
- The Indian National Centre for Ocean Information Services (INCOIS) has recently installed a cutting-edge Eddy Covariance Flux System (ECFS) on board the research vessel Sagar Nidhi. This system measures air-sea flux exchanges with unparalleled precision, making Sagar Nidhi the only moving platform in the Indian seas collecting eddy covariance fluxes on a permanent basis.
- INCOIS commemorated its 25th Foundation Day on 3rd February. On this occasion, the followings are launched/ inaugurated:
 1. National Glider Operations Facility.
 2. New Logo to mark the 25-year journey of INCOIS.
 3. An e-Classroom Facility at the International Training Centre for Operational Oceanography (ITCOO).
 4. Oceansat-3 Data Acquisition and Processing Facility.
 5. Marine Heat Wave Service for the Indian Ocean.
- India Meteorological Department (IMD) signed an Memorandum of Understanding (MoU) with Telangana State Load Dispatch Centre (TSSLDC) to ensure streamlined and strategic management of power through customized weather forecast on 1st February, 2023.
- IMD signed an MoU with Chitkara University, Chandigarh with an objective to promote research activities between the two institutions.

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	Commissionedsofar	Installations during the month	Data Reporting
Automatic Weather Station (AWS)	*457	--	457
Automatic Rain Gauge (ARG)	**466	--	466
Agro AWS	200	--	194
GPS Sonde based RS/RWStns.	56	--	56
Doppler Weather Radar (DWR)	***37	--	26
Ozone (Ozone Sonde + Total Ozone)	02	--	02
Surface Ozone (Electrochemical Concentration Cell method)	07	--	05
Nephelometer	12	--	09
Sky Radiometer	20	--	17
Black Carbon Monitoring Systems (Aethalometer)	25	--	19

Observation Type	Commissionedsofar	Installations during the month	Data Reporting
Air Quality Monitoring System (SAFAR)	10 (Delhi) 10 (Mumbai) 10(Ahmedabad)	--	09(Delhi) ****NIL(Mumbai) NIL(Ahmedabad)
Hydromet. (IMD & Extra-departmental excluding AWS &ARG)	---	--	3157
Aviation	94	--	94
Radiation Stations	47	---	47

* Out of Total 808 commissioned, 351 are outlived.

** Out of total 1382 commissioned, 916 are outlived.

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

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

Modelling

During February 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 23rd Feb 2023 the monthly mean forecast valid for February 2023 were also included for the users.

Monthly Weather Summary (February 2023)

a) Important Weather Events during the month

Western Disturbances:

Six Western Disturbances and four induced cyclonic circulations had affected Northwest India during the month. Under their influence, rainfall/ snowfall/ thunderstorm activity had been reported over Western Himalayan Region whereas isolated rainfall/ thunderstorms had been reported over the adjacent plains on a few days during the month. Remnants of Western Disturbances had caused rainfall/ snowfall/ thunderstorm activity over parts of Northeast India and adjoining Sub Himalayan West Bengal & Sikkim, Arunachal Pradesh, Assam & Meghalaya during the month.

Fog:

Dense to very dense fog had been reported over parts of Northwest, East and Northeast India on a few days during the month.

b) Rainfall Scenario:

The rainfall for the country as a whole, for the month of February 2023 has been recorded as 7.2 mm which is 32% of its Long Period Average (LPA) of 22.7 mm. Monthly rainfall for the country as a whole had been Large Deficient (-68%) for February 2023.

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	99
Day2 / 48 Hours	100
Day3 / 72 Hours	99

d) Temperature Scenario:

The mean temperature for the month of February 2023 for the country as a whole was 22.92°C which was above normal by +1.28 °C. The maximum temperature of 40.30°C had been recorded at Bhuj (Saurashtra & Kutch) on 16th February 2023 and

the minimum temperature of 3.0oC had been recorded at Churu (West Rajasthan) on 2ndFebruary 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	02	Nil	Nil	Nil
2.	Northwest India	08	5 {Batote-10 Feb, Bhuntar-10 Feb, Dehradun-21 Feb, Shimla-21 Feb, Pantnagar- 22 Feb}}	Nil	Nil
3.	Northeast India	08	1 {Passighat-22 Feb}	Nil	Nil
4.	East India	04	2 {Gangtok – 07 & 22 Feb}	Nil	Nil
5.	Central India	01	Nil	Nil	Nil
6.	West India	0	Nil	Nil	Nil

Bulletins/Warnings/Press Releases Issued:

All India Weather Bulletins:- 112, All India inference and severe weather warnings:- 112, All India Weekly Weather Reports:- 4, Daily guidance under Tropical Cyclone Forecasting Programme: 28, Extended Range Outlook for Cyclogenesis:- 4, Mountain weather bulletins issued for western and central Himalayan region:- 56, Marine Weather Bulletins:- 56, Severe weather guidance for next 5 days about heavy rain, strong winds, high waves & storm surge: 28, Daily Warnings for Fishermen in North Indian Ocean for next 5 days: 28, Fleet Forecast for Indian Navy for next 12 hours: 56, Bulletins for ships in deep sea under Global Maritime Distress Safety System for next 36 hours:- 56, Nowcast Guidance Bulletins for Severe Weather:- 28,

Press Releases issued during the month:- 42.

Publications & Operational Reports:

1. ENSO bulletin for the month of February 2023 and Seasonal Climate Outlook for South Asia for the period of February to May 2023 were issued.
(Quick Link :www.imdpune.gov.in/Clim_Pred_LRF_New/Products.html)
2. Climate Diagnostic Bulletin for September, October, November and June to September 2022 has been published and uploaded on the website.

Seismological Observational Network:

Observation Type	Commissioned so far	Data reporting during the month
Seismic stations	152	131

Earthquake and Tsunami monitoring

Earthquake:

136 earthquakes were monitored in the Indian region out of which 4 events were greater than the magnitude (M) of 5.0.

Tsunami:

3 seabed earthquakes (M>6) with a potential to generate tsunami have occurred during the month. These information were provided 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	80	51
Moored Buoys	19	12
Tide Gauges	36	33
High Frequency (HF) Radars	12	7
Acoustic Doppler Current	20	17

Profiler (ADCP)		
Tsunami Buoys	7	5
Wave Rider Buoy	16	12

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)	31
2.	Tuna Fishing Advisories	17
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	8

Outreach and Awareness

- One day on-line “Refresher Training Course in Aviation Meteorology” with special emphasis on Aviation Meteorological Observations & Reports and Aviation Forecast and Warning related issues was inaugurated by DGM, IMD on 07-02-2023.
- 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.).
- 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.
- NCMRWF organized training courses on Modelling and forecast activities to officers of Indian Air Force between 20-25 Feb 2023. They were also given exposure to the super computing facilities at NCMRWF.
- Students from Calcutta University attended in-person training program on modeling and forecasting using super computers at NCMRWF during 13-25 Feb 2023.
- Students from the various colleges/ institutes/ universities visited Centre for Marine Living Resources and Ecology (CMLRE), INCOIS, IITM and NCMRWF.
- As part of 'Nari Gyan Badhe Vigyan' NCMRWF celebrated the 8th International Day for Women and Girls in Science on 11 Feb 2023 at the NCMRWF campus.
- The second phase of National Training workshop on fundamentals of Data Assimilation (NTDA) was conducted by IITM during 6-10 February 2023 by arranging open lecture series on Big Data Analysis by Prof. Laxmivarahan, University of Oklahoma, USA, which was attended by 40 participants.
- IITM in coordination with a team of researchers working on National Atmospheric Chemistry, started a monthly seminar series entitled, "National Atmospheric Chemistry Seminar Series (NACSS)". The first seminar of this series was delivered online by Prof. Chandra Venkataraman, IIT Bombay on 24 February 2023. This online seminar aims to increase interaction between scientists doing some cutting-edge research on atmospheric chemistry in India and will be beneficial to researchers and students.
- IITM celebrated the National Science Day on 28 February by observing an open day at its premises. On this occasion, students/visitors/media persons/etc., were taken on a guided tour of the various R&D facilities/labs at IITM to showcase them the R&D activities of the Institute and briefed about the R&D activities of IITM through an introductory talk and documentary film.
- INCOIS user interaction program in collaboration with M S Swaminathan Research Foundation (MSSRF) was conducted at Tuticorin on 1st February

2023 and at Karaikal on 8thFebruary 2023. The fisher folks were introduced to the benefits of new services available in the Potential Fishing Zone advisories and Ocean State Forecast.

- On 9thFebruary 2023, a Tsunami Mock Exercise was conducted in Andaman and Nicobar Islands by the National Disaster Management Authority and the Andaman and Nicobar Islands Administration to test the readiness of the emergency services. INCOIS issued seven test bulletins to all stakeholders between 09:07-13:00hours IST and public evacuation was carried out at several locations.
- ITCOO-INCOIS organized training course on “Data Science and AI” during 16 - 23 February, 2022. Around 35 participants including officers from NIOT, Chennai and Indian Navy attended the training course.
- INCOIS in collaboration with the National Institute of Oceanography-RC Visakhapatnam and Centre for Studies on Bay of Bengal (CSBOB), Andhra University conducted a five-day training programme during 20 to 24 February on ‘Ocean Observation Systems, Models to Ocean State Forecast, Coastal Dynamics and Potential Fishing Zone’ at the Centre for Studies on the Bay of Bengal. The target group of the programme was young researchers, technicians, professionals and government employees dealing with marine and fishing activities.
- INCOIS conducted six (6) User Interaction Workshops/ Awareness campaigns in collaborations with Project Investigators of INCOIS funded projects at field level in Kerala, Maharashtra and Tamil Nadu. Operational Ocean Services team members participated and provided lectures and interacted with Fishermen/ user community.
- MoES is participating in the G20 events.

Publications

Subject	Publications			Ph.Ds		
	April 22 – Jan 2023	Feb 23	Total	April 22 – Jan 2023	Feb 23	Total
Atmospheric Sciences	166	15	181	21	1	22

Ocean Science and Technology	75	5	80	6	-	6
Polar Sciences	24	1	25	-	-	-
Geosciences and resources	53	7	60	1	-	1
Total	318	28	346	28	1	29

Utilization of Ocean Research Vessels during the month

Vessel	Days at Sea/ Utilization	Maintenance/ Inspection/Scientific Logistics/ Cruise Preparation	No. of Cruise
Sagar Nidhi	26	2	1
Sagar Manjusha	16	12	1
Sagar Tara	20	8	2
Sagar Anveshika	14	14	1
Sagar Kanya	0	28	0
Sagar Sampada	0	28	0

MoES/20/01/2017-Estt.

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

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New Delhi-110 003
Dated, the March, 2023

**CERTIFICATE
(FOR THE MONTH OF FEBRUARY, 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 February, 2023. 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	-	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	-	00


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