

Ministry of Earth Sciences (MoES)

Summary of Important Developments – January, 2022

1. **Important policy decisions taken and major achievements during the month:** Provided in Annex I.
2. **Important policy aspects / matters held up on account of prolonged Inter- Ministerial consultations/ delays, etc.:** Nil
3. **Compliance of COS (Committee of Secretaries) decisions:**

S.No.	Number of COS decisions pending for compliance	Proposed action plan/ timelines	Remarks
1.	<p>Dt 14/08/2014 PROPOSAL FOR KRILL FISHING</p> <p>MoES, in collaboration with MEA (Ministry of External Affairs), will study the experience of different countries showing varied interest in krill fishing so that India could learn from their experiences. MEA, in collaboration with MoES, will examine and identify the countries with which India can collaborate for krill fishing. MoES will ascertain the interest of Indian industry in krill fishing and also explore the feasibility of Indian companies collaborating directly with foreign companies MoES will study legislations enacted by other member countries before finalising the draft legislation as part of international convention obligations.</p> <p>MoES will bring out a paper on krill fishing giving a detailed account of demand analysis, financial viability, interest of industry, experiences of other countries, criteria for fishing license, existing knowledge gap, etc. Thereafter, the CoS will meet again to decide whether India should engage in commercial krill fishing.</p>	<p>The Ministry has examined the aspect of Krill fishing. Japan & Norway have developed expertise and these countries have been tentatively identified for collaboration on Krill fishing. Their experiences have been obtained. Indian Industries have been approached for Krill fishing to ascertain their interests. However, so far we have not received any response. The draft paper is prepared and suggestions of Cabinet Secretariat have been obtained.</p>	<p>A proposal has been mooted through NITI Aayog for collaboration with Norway for krill fishing.</p>

4. **Cases of sanction for prosecution pending in the Ministry for more than three months:** Nil
5. **Particulars of cases in which there has been a departure from the Transaction of Business rules of established policy of the Government:** Nil
6. **Status of implementation of e-Governance:** Being implemented
7. **Status of Public grievances:**

No. of Public Grievances redressed during the month	No. of Public Grievances pending at the end of the month
40	38

8. Information on the specific steps taken by the Ministry/ Department 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.

9. (i) **Confirmation that the incumbency details of all posts in the Ministry/Department and its organizations falling under the purview of the ACC (Appointments Committee of Cabinets) have been updated on AVMS (ACC Vacancy Monitoring System):** 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.
- (ii) **Status regarding compliance of the directions of ACC:** It is also confirmed that the directions of ACC are complied with.
- (iii) **Status of cases where recommendations from PESB (Public Enterprise Selection Board) have been received but the proposals are yet to be submitted to the ACC Secretariat:** NIL

Important policy decision taken and major achievements:

- India Meteorological Department (IMD) celebrated its 147th Foundation Day ceremony on 14th January, 2022. The event was inaugurated by Hon'ble Minister Dr. Jitendra Singh, and special address was given by Hon'ble Lt Governor of Ladakh, Shri R K Mathur. Hon'ble Member of Parliament (Ladakh), Shri. JamyangTsering Namgyal was also attended the function. On this occasion, four (4) Doppler weather radars (DWRs) viz. C-band Polarimetric at Veravali (Mumbai), X-band Polarimetric at Ayanagar (Delhi), Pallikaranai (Chennai) and Leh were inaugurated by Hon'ble Minister. Further, four (4) initiatives viz. (i) Dedicated website for Aviation Weather Services (ii) Geospatial Services for severe weather monitoring & forecasting (iii) Climate Hazards and Vulnerability Atlas and (iv) Public Observation System through "crowd sourcing mobile app" were also inaugurated by Hon'ble Minister and other dignitaries. On this occasion, following books were released:
 - Statement on Climate of India during 2021
 - Report on Cyclonic Disturbances over the North Indian Ocean during 2021
 - Report on verification of sub-basin wise quantitative precipitation forecast during southwest monsoon season 2021
 - A report on numerical weather prediction model products for sectoral applications
 - Use of weather information for secure, reliable and economic operation of Indian grid
 - A report on meteorological applications of Indian GNSS derived IPWV
 - Mausam Issue Vol. 73, Issue 1
 - Mausam Manjusha (34th Issue)
 - Edited volume of poems and posters received from people through countrywide competitions conducted by IMD during 18-24 October, 2021 to commemorate 75 years of independence under the programme AzadiKaAmritMahotsav.
- The annual mean land surface air temperature averaged over India during 2021 was +0.44^o C above the long-term average (1981-2010 period). The year 2021 was the fifth warmest year on record since nationwide records commenced in 1901.
- Northeast Monsoon rains had ceased over Tamil Nadu, Puducherry & Karaikkal, Kerala & Mahe and adjoining areas of Coastal Andhra Pradesh & Yanam, Rayalaseema and South Interior Karnataka with effect from 22nd January, 2022.
- A Memorandum of Understanding (MoU) is signed between Indian Air Force (Directorate of Meteorology) and National Centre for Medium Range Weather Forecasting (NCMRWF) on "Mutual Cooperation with Emphasis on Numerical Weather Prediction and Aviation Meteorology".
- Indian National Centre for Ocean Information Services (INCOIS) signed a MoU with Indian Institutes of Technology (IIT) Madras for collaborative research in the field of ocean observations.

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

Observation Type	Commissioned so far	Installations during the month	Data Reporting
Automatic Weather Station (AWS)	*325 (727-402)	--	325
Automatic Rain Gauge (ARG)	505** (1382-877)		505
Agro AWS	195	12	188
GPS Sonde based RS/RW (Radio Sonde/ Radio Wind Stations)	56	--	56
Doppler Weather Radar (DWR)	*** 32		24
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)**** 10 (Ahmedabad)
Hydromet (Indian Meteorological Department (IMD)& Extra-departmental excluding AWS &ARG)	---	--	3250
Aviation	79	--	79
Radiation Stations	46	---	46

*Out of Total 727, 402 are outlived.

** Out of total 1382, 877 are outlived.

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

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

Modelling

During January, every week on Thursdays, 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 and IAF for use at their end.

Monthly Weather Summary (January 2022)

a) Important Weather Events during the month

Low Pressure Systems: A total number of seven Western Disturbances have affected Northwest India during the month. These have caused fairly widespread to widespread rainfall/ snowfall activity and isolated to scattered rainfall/ snowfall activity over Western Himalayan Region and over the plains of Northwest and adjoining Central India. Remnants of Western Disturbances in the form of cyclonic circulations/ troughs had caused fairly widespread to widespread rainfall/ thunderstorm activity over parts of East and Northeast India.

Dense to very dense fog had been reported over parts of Northwest, Central and East India on a few days during the month with maximum days of occurrence over Uttar Pradesh.

Parts of Northwest and Central India experienced prolonged spells of Cold day to severe cold day conditions during the month.

b) Rainfall Scenario: The rainfall for the country as a whole, for the month of January-2022 has been recorded as 39.6 mm which is 229% of its Long Period Average (LPA) of 17.3 mm.

c) Heavy Rainfall Events:

Warning issued for	No. of Heavy/Very Heavy Rainfall Events (>64.4 mm): 31
	Percentage correct (in %) for Rainfall >64.4mm
Day1 / 24 Hours	97
Day2 / 48 Hours	98
Day3 / 72 Hours	98

d) Temperature Scenario: The mean temperature for the month of January-2022 for the country as a whole was 19.73⁰C which was above normal by 0.09⁰C. The maximum temperature of 37.3⁰C had been recorded at Kottayam (Kerala & Mahe) on 29th January 2022 and the minimum temperature of 1.6⁰C had been recorded at Hissar (Haryana, Chandigarh & Delhi) on 2nd January 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	8	7	0	0
3	Arunachal Pradesh	0	0	0	0
4	Assam	0	0	0	0
5	Bihar	6	4	5	4

S. No.	State/ UT	Thunderstorm Events	Hail Events	Dust storms	Gusty Winds
6	Chandigarh	0	0	0	0
7	Chhattisgarh	2	0	0	0
8	Dadar and Nagar Haveli	0	0	0	0
9	Delhi	2	1	1	2
10	Goa	0	0	0	0
11	Gujarat	0	0	0	2
12	Haryana	16	3	3	8
13	Himachal Pradesh	2	1	0	0
14	J & K	0	0	0	0
15	Jharkhand	0	0	0	0
16	Karnataka	1	1	1	2
17	Kerala	2	1	2	1
18	Ladakh	0	0	0	0
19	Lakshdweep Islands	0	0	0	0
20	Madhya Pradesh	0	2	2	0
21	Maharashtra	1	0	0	4
22	Manipur	0	0	0	0
23	Meghalaya	0	0	0	0
24	Mizoram	0	0	0	0
25	Nagaland	0	0	0	0
26	Odisha	4	4	0	0
27	Puducherry	0	0	0	0
28	Punjab	2	2	2	1
29	Rajasthan	4	5	3	7
30	Sikkim	0	0	0	0
31	Tamilnadu	0	0	0	2
32	Telangana	2	2	0	1
33	Tripura	3	2	0	1
34	Uttar Pradesh	6	6	7	4
35	Uttarakhand	1	0	0	0
36	West Bengal	3	1	0	1

Bulletins/Warnings/Press Releases Issued:

All India Weather Bulletins:-124, All India inference and severe weather warnings:-124, All India Weekly Weather Reports:-4, Mountain weather bulletins issued for western and central Himalayan region:-62, All India Multi-hazard winter weather warnings bulletin issued for North India:-31, Current Temperature Status and Cold wave Warning Bulletin for next 24 hours issued for North India:- 31, Marine Weather Bulletins:-62, Nowcast Guidance Bulletins for severe weather:-31, Total numbers of Press Releases issued during the month:- 45.

Publications & Operational Reports:

- i) El Niño-Southern Oscillation (ENSO) bulletin for the month of January 2022 and Seasonal Climate Outlook for South Asia for the period of January to April 2022 were issued. (Quick Link: 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°C resolution at 4 weekly, 1, 2, 3, & 4 monthly time scales. Uploaded the maps of the afore mentioned timescales at weekly basis on IMD Pune website.
- iii) Four weekly and cumulative Standardized Precipitation Index (SPI) maps were prepared for the weeks ending 01.12.2021, 08.12.2021, 15.12.2021, 22.12.2021 and 29.12.2021 and supplied for use in Agromet Advisory Services Bulletin. The same have also been uploaded in IMD Pune website.
- iv) Four weekly and cumulative Standardized Precipitation Index (SPI) maps were prepared for the weeks ending 05.01.2022, 12.01.2022, 19.01.2022 and 26.01.2022 and supplied for use in Agromet Advisory Services Bulletin. The same have also been uploaded in IMD Pune website.
- v) Four weekly Aridity Anomaly Maps for the period 30th December 2021 to 05th January 2022, 06th to 12th, 13th to 19th, 20th to 26th January 2022 have been prepared and uploaded on IMD Website.
- vi) Four weekly Aridity Anomaly Outlook Maps for the period 06th to 12th, 13th to 19th, 20th to 26th and 27th January to 02nd February 2022 have been prepared and uploaded on IMD Website.
- vii) Climate Diagnostic Bulletin for September and October 2021 has been published.

Seismological Observational Network

Observation Type	Target	Commissioned so far	Data reporting during the month
Seismic stations	115	152	144

Earthquake and Tsunami monitoring

Earthquake: 97 earthquakes were monitored in the Indian region out of which 6 events were greater than the magnitude (M) of 5.0.

Tsunami: 2 seabed earthquakes (M > 6) with a potential to generate tsunami occurred. This information was provided in less than 12 minutes of occurrence of all the events.

Ocean Observation System

Type of Platform	Target	Commissioned till December, 2021	Data received during January, 2022
Argo Floats *	200	374	75
Moored Buoys	16	19	11

Tide Gauges	36	36	29
High Frequency (HF) Radars	10	12	10
Acoustic Doppler Current Profiler (ADCP)	20	20	17
Tsunami Buoys	4	7	2
Wave Rider Buoy	23	16	12

*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)	29
2.	Tuna Fishing Advisories	29
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)	30
5.	Coral Bleaching Alert System	10

Outreach and Awareness

- Prof Gopu R Potty, University of Rhode Island USA visited National Institute of Ocean Technology (NIOT) as Science & Engineering Research Board (SERB) - Visiting Advanced Joint Research (VAJRA) Adjunct faculty for one month during Dec 13, 2021 – Jan 13, 2022 and successfully completed his first visit by interacting with the Ocean acoustics group.
- MoES and its institutes celebrated 73rd Republic Day.
- The 8th National Centre for Earth Science Studies (NCESS) Foundation Day Lecture was organized on 03rd January 2022. The virtual function was presided by Dr. M. Ravichandran, Secretary, MoES.
- A team of 21 scientists from various Ministries/ Departments visited National Centre for Polar and Ocean Research (NCPOR) on 12th January 2022 as a part of the eight-week training program for scientists and technologists, being conducted by the Indian Institute of Public Administration (IIPA), New Delhi, and sponsored by the Department of Science & Technology, Government of India.
- IMD issued rainfall forecast for January-March, 2022 through a Press Release on 3rd January.
- 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.
- Bulletins and Warnings along with graphics were also communicated through Social Media including Facebook, Twitter, Instagram, YouTube and IMD Blog page.
- Students from Mathematics Department, Gogotias University visited NCMRWF and given exposure to different activities at NCMRWF. The visit was a part to commemorate the 75th anniversary of Independence of India under ‘Azadi ka Amrit Mahotsav’.

Publications

Subject	Publications			Ph.Ds		
	April, 2021 – December 2021	January, 2022	Total	April, 2021 – December 2021	January, 2022	Total
Atmospheric Sciences	178	17	195	6	-	6
Ocean Science and Technology	83	11	94	2	2	4
Polar Sciences	40	1	41	1	-	1
Geosciences and resources	90	5	95	2	-	2
Total	391	34	425	11	2	13

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	31	0
SagarManjusha	0	31	0
Sagar Tara	8	23	1
SagarAnveshika	14	17	2
SagarKanya	15	16	1
Sagar Sampada	0	31	0

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

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Dated, the 14th February, 2022

CERTIFICATE

(FOR THE MONTH OF JANUARY, 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 January, 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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