

Ministry of Earth Sciences (MoES)
Summary of Important Developments – January, 2021

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>

☐ **Cases of sanction for prosecution pending in the Ministry for more than three months:** Nil

☐ **Particulars of cases in which there has been a departure from the Transaction of Business rules of established policy of the Government:** Nil

☐ **Status of implementation of e-Governance :** Being implemented

☐ **Status of Public grievances:**

No. of Public Grievances redressed during the month	No. of Public Grievances pending at the end of the month
13	09

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

Annex-I

Important policy decision taken and major achievements:

1. The 40th Indian Scientific Expedition to Antarctica with 43 expedition members was launched from Goa on 4th January 2021 onboard chartered expedition vessel.
2. Coastal Research Vessel (CRV) Sagar Anveshika was dedicated to the Nation by Dr. Harsh Vardhan, Hon'ble Union Minister of Earth Sciences, Science & Technology and Health & Family Welfare on 9th January 2021 at Chennai Port.
3. During the year 2020, annual mean land surface air temperature averaged over the country was +0.29°C above normal (based on the data of 1981-2010). The year 2020 was the eighth warmest year on record since nationwide records commenced in 1901. However, this is substantially lower than the highest warming observed over India during 2016 (+0.71°C).
4. The 2020 annual rainfall over the country as a whole was 109% of its Long Period Average (LPA) based on the data of 1961-2010.
5. Dr. Harsh Vardhan, Hon'ble Union Minister for Earth Sciences, Health & Family Welfare and Science & Technology dedicated the followings to the nation in the presence of the Guests of Honour Shri Trivendra Singh Rawat, Hon'ble Chief Minister of Uttarakhand and Shri Jai Ram Thakur, Hon'ble Chief Minister of Himachal Pradesh:-
 - a. Two Doppler Weather Radars installed at Mukteshwar (Uttarakhand) & Kufri (Shimla, Himachal Pradesh).
 - b. Multi Mission Meteorological Data Receiving & Processing System (MMDRPS) established in collaboration with Indian Space Research Organisation (ISRO).
 - c. Online Web Portal of India Meteorological Department (IMD) Journal MAUSAM, online web portal for Special Issue of Mausam on the theme "Tropical Cyclones", Report on Cyclonic Disturbances during 2020 and Hindi Patrika Mausam Manjusha.
6. Indian Institute of Tropical Meteorology (IITM) signed MoUs with Cotton University, Guwahati and Commissioner of Disaster Management, Govt of Tamil Nadu for collaboration in lightning and thunderstorm research and data sharing.
7. National Institute of Ocean Technology (NIOT) signed MoU with Central Marine Fisheries Research Institute (CMFRI) for collaboration in Marine Biotechnology.
8. Centre for Marine Living Resources and Ecology (CMLRE) signed a MoU with CMFRI for research collaboration in marine fishery.

All instructions / guidelines regarding lockdown due to COVID-19 issued by the government are strictly adhered.

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 40 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)	324*		300
Automatic Rain Gauge (ARG)	358**	--	336
GPS Sonde based RS/RW (Radio Sonde/Radio Wind) Stations	56	--	56
Doppler Weather Radar (DWR)	28***	--	28
Ozone (Ozone Sonde + Total Ozone)	04	--	04
Surface Ozone (Electrochemical Concentration Cell method)	07	--	07
Nephelometer	12	--	12
Sky Radiometer	20	--	18
Black Carbon Monitoring Systems (Aethalometer)	25	--	23
System of Air Quality Monitoring System (SAFAR)	10 (Delhi) 10 (Mumbai) 10 (Ahmedabad)	--	09 (Delhi) 10 (Mumbai) 10 (Ahmedabad)
Hydromet. (Indian Meteorological Department (IMD)& Extra-departmental excluding AWS &ARG)	---	--	3164
Aviation	79	--	79
Radiation Stations	46	---	38

* Out of Total 724, 400 are outlived.

** Out of total 1358, 1000 are outlived.

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

4 Digital Current Weather Indicating Systems (DCWIS) were installed at Aerodrome Meteorological Office (AMO) Nagpur, Sindhudurg Airport, Aerodrome Meteorological Station (AMS) Madurai and AMS Tiruchirappalli during the month.

Modelling

Every week on all Thursdays during January 2021, National Centre for Medium Range Weather Forecasting (NCMRWF) provided coupled model based Extended Range Prediction (ERP) up to next four weeks for rainfall, surface temperature, and winds in real-time to Space Applications Centre (SAC) / Indian Space Research Organisation (ISRO), Snow and Avalanche Study Establishment (SASE) / Defence Research and Development Organisation (DRDO), Indian Air Force (IAF), Navy, Geological Survey of India (GSI), National Institute of Hydrology (NIH) and Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) countries. Weekly anomaly of snow forecasts were sent to SASE and IAF.

Monthly Weather Summary (January 2021)

a) Important Weather Events during the month

Low Pressure Systems: Four Western Disturbances and two induced cyclonic circulations have affected Northwest India during the month of January 2021. These systems have caused wet spell and severe weather during the period. Movement of easterly waves in the form of troughs and cyclonic circulations have caused fairly widespread to widespread rainfall/thunderstorm activity over extreme south Peninsula, Andaman & Nicobar and Lakshadweep islands during the month. Remnants of Western Disturbance have caused isolated to scattered rainfall/ thunderstorm activity over parts of Northeast India and adjoining areas of East India.

Fog: Dense to very dense fog had occurred at most places over Punjab, Uttar Pradesh, Odisha, Bihar, Haryana, Chandigarh, Delhi, Rajasthan, Sub Himalayan West Bengal, Sikkim, Madhya Pradesh, Tamil Nadu, Puducherry & Karaikkal, Uttarakhand and Assam & Meghalaya.

Cold: Cold day to severe cold day had occurred at most places over Haryana, Chandigarh, Delhi, Punjab, Uttar Pradesh, Bihar, Jharkhand, East Madhya Pradesh and Rajasthan.

Cold Wave: Cold wave to severe cold wave had occurred at many places over Haryana, Chandigarh, Delhi, Punjab, East Madhya Pradesh, Bihar, Uttar Pradesh, Rajasthan, Saurashtra & Kutch and Uttarakhand.

b) Rainfall Scenario: The rainfall for the country as a whole for the month of January 2021 has recorded as 20.2mm which is 17% higher than its Long Period Average (LPA) of 17.3mm.

c) Heavy Rainfall Events:

Warning issued for	No. of Heavy/Very Heavy Rainfall Events (>64.4 mm): 30
	Percentage correct (in %) for Rainfall >64.4mm
Day1 / 24 Hours	98%
Day2 / 48 Hours	97%
Day3 / 72 Hours	98%

d) Temperature Scenario: The Mean Temp for the month for the country as a whole was 20.82°C; which was above normal by +0.34°C. The lowest minimum temperature of -1.2°C had been recorded at Hissar (Haryana) on 1st January 2021 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	Date of Maximum TS Activity	Hail Events	Squall Events
1.	South Peninsular India	11	06-01-21	Nil	Nil
2.	Northwest India	07	06-01-21	Nil	Nil
3.	Northeast India	03	21-01-21	Nil	Nil
4.	East India	01	28-01-21	Nil	Nil
5.	Central India	04	28-01-21	Nil	Nil
6.	West India	01	07-01-21	Nil	Nil

Bulletins/Warnings/Press Releases Issued:

All India Weather Bulletins – 124 (issued four times daily), All India weather inference and severe weather warnings – 124 (issued four times daily), All India Weekly Weather Reports – 4 (issued every Thursday), Mountain weather bulletins including severe weather warnings for Western and Central Himalayan region – 62, Marine Weather forecast Bulletins: 62, Tropical Weather Outlook for the north Indian Ocean – 31, Bulletins of the Severe Weather Forecast Programme -31, Nowcast Guidance Bulletins for severe weather:- 31, Bulletins of the Severe Weather Forecast Programme:- 31, Extended range outlook on Cyclogenesis:- 4. Swell surge warnings were issued 3 days in advance for the period 12:30 hours of 09-01-2021 to 23:30 hours of 11-01-2021 to Maharashtra, Goa, Karnataka, Goa, Kerala, Lakshadweep and South Tamil Nadu.

Provided data on wave and wind for Dahanu-Vadhavan region from 11th Oct, 2020 to 26th Oct, 2020 for Jawaharlal Nehru Port Trust (JNPT), Mumbai.

Publications & Operational Reports:

- i) Climate Diagnostic Bulletin for July, August, September 2020 and for Monsoon 2020 has been published.
- ii) ENSO bulletin for January 2021 and Seasonal Climate Outlook for South Asia for the month of January to April 2021 were issued. (Quick Link: www.imdpune.gov.in/Clim_Pred_LRF_New/Products.html)
- iii) Daily All India Weather Summary and Weekly Weather Reports are being brought out on routine basis.
- iv) Four (4) weekly and cumulative Standardized Precipitation Index (SPI) maps were prepared for the weeks ending 06, 13, 20 & 27th January 2021 prepared and uploaded at IMD Pune website.
- v) 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 computed and maps of same timescales are being uploaded at weekly basis on IMD Pune website.

Important Press Releases:

- i) Related to the lowest minimum temperature of Delhi:- 1
- ii) Related to Wet spell over Northwest & adjoining Central India during 3rd-6th January, 2021 and abatement of Cold Wave & Cold Day conditions from Northwest India from 3rd Jan. 2021:- 1
- iii) Related to Statement on Climate of India during 2020:- 2 (both in English & Hindi)
- iv) Related to current weather status and outlook for two weeks:-4
- v) Related to Monthly Weather Review for Dec, 2020 and Weather Outlook for the month of Jan 2021:- 1
- vi) Press release on the occasion of launching of 40th Indian Scientific Expedition to Antarctica-1

Seismological Observational Network

Observation Type	Target	Commissioned so far	Data reporting during the month
Seismic stations	115	115	104
GPS stations	40	20#	18

20 out of 40 are connected with VSAT, remaining 20 are operating in stand-alone mode.

Earthquake and Tsunami monitoring

Earthquake: 90 earthquakes were monitored in the Indian region out of which 3 events were greater than magnitude (M) of 5.0.

Tsunami: 4 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 January, 2021	Data received during January, 2021
Argo Floats *	200	374	119
Moored Buoys	16	19	9
Tide Gauges	36	36	31
High Frequency (HF) Radars	10	12	9
Acoustic Doppler Current Profiler (ADCP)	20	20	18
Tsunami Buoys	7	4	3
Wave Rider Buoy	23	16	13

*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	31
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

One day **Brainstorming Workshop on Monsoon - 2020** was organised on 18 January 2021, followed by 2 days National E-symposium on "Cloud and Precipitation Processes" during 19-20 January 2021.

An online webinar titled "Ariviyal Palagai" was organized by Vigyan Prachar jointly with NIOT. 4 live talks have been delivered during the month.

NCMRWF organized a three day (20-22 January 2021) web-based online workshop on "Use of Products from Ensemble Prediction Systems" to discuss the issues related to the use of probabilistic weather forecast at the users end for improved decision making. About 100 participants from different MoES institutions, academic institutes, various user sectors viz. Weather forecasting, Agriculture, Defense, Renewable Energy, Water Management, Disaster Management etc. participated in the workshop. Scientists from UK and Australia also participated in the workshop.

Climate Research and Services Division (CR&S), IMD, Pune organized a Stakeholders virtual meeting jointly with State National Vector Borne Disease Control Programme (NVBDCP), Government of Odisha and "Malaria No More " organization on "Health-Climate Interface in India: CLIMATE-BASED MALARIA FORECASTING IN ODISHA FOR MALARIA ELIMINATION" on 28th January, 2021. Scientists from IMD Pune along with officials from State NVBDCP, Government of Odisha; and Malaria No More, presented the new initiative on malaria advance alerts using weather and climate forecast and also future plan of IMD along with stakeholders.

3 days Online training program on "Assessment of Climate Change and its impacts over the Indian region-RCP 4.5 Scenario" with FARMBRIDGE FOUNDATION- Bharuch Gujarat, was conducted by Indian Institute of Tropical Meteorology (IITM).

Publications

Subject	Publications			Ph.Ds		
	April-December 2020	January, 2021	Total	April-December 2020	January, 2021	Total
Atmospheric Sciences	176	20	196	4	-	4
Ocean Science and Technology	100	3	103	2	-	2
Polar Sciences	38	3	41	1	-	1
Geosciences and resources	23	4	27	0	-	0
Total	337	30	367	7	-	7

Patents: 2

Utilization of Ocean Research Vessels during the month

Vessel	Days at Sea / Utilization	Maintenance/ Inspection /Scientific Logistics / Cruise Preparation	No. of Cruise
Sagar Nidhi	11	20	1
Sagar Manjusha	0	31	0
Sagar Tara	25	6	3
Sagar Anveshika	3	28	1
Sagar Kanya	0	31	0
Sagar Sampada	20	11	1

Annex II

Government of India
Ministry of Earth Sciences

Prithvi Bhavan, Lodhi Road
New Delhi-110 003


Dated, the 02 February, 2021

CERTIFICATE

(FOR THE MONTH OF JANUARY, 2021)

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, 2021. 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	-11
(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


(Anju Bhalla)
Joint Secretary
anju_bhalla@nic.in