

**Ministry of Earth Sciences (MoES)**  
**Summary of Important Developments –February, 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 &amp; 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
16	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

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### Annex-I

#### Important policy decision taken and major achievements:

1. India was re-elected as a Member of Council of International Seabed Authority in the recently concluded election. Council is the decision making body of the Authority.
2. Expedition vessel, VasilyGolovnin, sailed from Mormugao, Goa on 7th January 2021, reached Bharati station, Antarctica on 10th February 2021 for scientific operations. 14 members of the 40<sup>th</sup> Indian Scientific Expedition to Antarctica (ISEA) for Maitri station along with 01 overwinter member of Bharati station reached Maitri on 15th February 2021 for scientific operations.
3. A Memorandum of Understanding (MoU) has been signed between National Institute of Ocean Technology (NIOT) and the University of Massachusetts – Dartmouth (UMassD), United States of America (USA) on Mutual Collaboration in Ocean Science and Technology on 2<sup>nd</sup> February 2021.

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*		315
Automatic Rain Gauge (ARG)	360**	2	366
GPS Sonde based RS/RW (Radio Sonde/Radio Wind) Stations	56	--	56
Doppler Weather Radar (DWR)	28***	--	27
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)	---	--	3119
Aviation	79	--	79
Radiation Stations	46	---	36

\* Out of Total 724, 400 are outlived.

\*\* Out of total 1360, 1000 are outlived.

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

### Modelling

Every week on all Thursdays during February 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 Indian Institute Of Tropical Meteorology (IITM) ERP group, Long-range forecast and Agri-Met divisions of IMD, 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.

NCMRWF from 17th Feb 2021 started sending daily forecasts to National Centre for Polar and Ocean Research (NCPOR), the Sea-Ice related parameter for the South Polar Region (Antarctica) from NCMRWF coupled model. The forecasts were used for the movement of chartered ice class expedition ship 'VasilyGolovnin' used in NCPOR's 40th scientific expedition to Antarctica.

### Monthly Weather Summary (February 2021)

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

Low Pressure Systems: Six Western Disturbances and four induced cyclonic circulations affected Northwest India during the month of February 2021; fairly widespread rainfall/snowfall activity over Western Himalayan Region, Northwest and East India had occurred.

Fog: Dense to very dense fog had occurred at most places over Haryana, Chandigarh, Delhi, Punjab, Uttar Pradesh, Bihar, West Rajasthan, West Madhya Pradesh and Odisha.

Cold: Cold day to severe cold day had occurred at few places over East Madhya Pradesh, Bihar, West Bengal, Sikkim, Odisha, Punjab and East Uttar Pradesh.

Cold Wave: Cold wave to severe cold wave had occurred at few places over Punjab, Odisha, Madhya Pradesh, Chhattisgarh, Haryana, Chandigarh, Delhi, Uttar Pradesh, Bihar, Gangetic West Bengal, Saurashtra & Kutch, Uttarakhand, Vidarbha and Jharkhand.

**b) Rainfall Scenario:** The rainfall for the country as a whole for the month of February 2021 has recorded as 7.6mm which is 68% lower than its Long Period Average (LPA) of 23.5mm.

#### c) Heavy Rainfall Events:

Warning issued for	No. of Heavy/Very Heavy Rainfall Events (>64.4 mm): 11
	Percentage correct (in %) for Rainfall >64.4mm

Day1 / 24 Hours	99%
Day2 / 48 Hours	99%
Day3 / 72 Hours	99%

**d) Temperature Scenario:** The Mean Temp for the month of February 2021 for the country as a whole was 22.55°C; which was above normal by +0.9°C.

**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	04	19-02-21	Nil	Nil
2.	Northwest India	10	04-02-21 & 05-02-21	Nil	Nil
3.	Northeast India	03	07-02-21	01 (Churk on 18-02-2021) 01 (Lucknow on 18-02-2021)	Nil
4.	East India	06	16-02-21	Nil	Nil
5.	Central India	06	16-02-21	Nil	Nil
6.	West India	06	Nil	Nil	Nil

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

All India Weather Bulletins – 112 (issued four times daily), All India weather inference and severe weather warnings – 112 (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 – 56, Marine Weather forecast Bulletins: 56, Tropical Weather Outlook for the north Indian Ocean – 28, Nowcast Guidance Bulletins for severe weather:- 28, Bulletins of the Severe Weather Forecast Programme:- 28, Extended range outlook on Cyclogenesis:- 4, FDP bulletin for winter weather system: 28.

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

- i) ENSO bulletin for February 2021 and Seasonal Climate Outlook for South Asia for the month of February to May 2021 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) Daily All India Weather Summary and Weekly Weather Reports are being brought out on routine basis.
- iii) Four (4) weekly and cumulative Standardized Precipitation Index (SPI) maps were prepared for the weeks ending 03, 10, 17 & 24 February 2021 prepared and uploaded at IMD Pune website.
- iv) ENSO bulletin for February 2021 and Seasonal Climate Outlook for South Asia for the month of February to May 2021 were issued.
- v) CRS Report on Development of daily gridded rainfall data sets over the Indian Islands at 1°x1° & 0.25°x 0.25° spatial resolutions for the period (1951-2020) was issued.
- vi) Monthly and cumulative Standardized Precipitation Index (SPI) maps were prepared for the month ending January 2021 and uploaded in IMD Pune website.
- vii) Gridded Standardized Precipitation Index (SPI) & Standardized Precipitation Evapotranspiration Index (SPEI) at 0.5°x0.5 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 forecast for Uttarakhand:- 23
- ii) Related to Monthly Weather Review for the month of Jan 2021 and Weather Outlook for the month of Feb 2021:- 1
- iii) Related to current weather status and outlook for two weeks:-4
- iv) Annual Climate Summary 2020 published.

### Seismological Observational Network

Observation Type	Target	Commissioned so far	Data reporting during the month
Seismic stations	115	115	107
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: 113 earthquakes were monitored in the Indian region out of which 2 events were greater than 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 February, 2021	Data received during February, 2021
Argo Floats *	200	374	119
Moored Buoys	16	19	13
Tide Gauges	36	36	32
High Frequency (HF) Radars	10	12	12
Acoustic Doppler Current Profiler (ADCP)	20	20	18
Tsunami Buoys	4	7	3
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)	28
2	Tuna Fishing Advisories	28
3	Ocean State Forecast (OSF)-Wave, Wind, Currents, SST (Sea Surface Temperature), MLD (Mixed Layer Depth) and D20 forecasts	28
4.	Real time global ocean analysis (daily)	30
5.	Coral Bleaching Alert System	10

### Marine Living Resources

Samples collected from the South-Eastern Arabian Sea at 326m depth during FORV Sagar Sampada cruise, yielded a new species of deep-water ghost shrimp family Axiidae, proposed to be named as *Acanthaxius keralam*, in honour of the state of Kerala.

Centre for Marine Living Resources & Ecology (CMLRE) has initiated a dolphin monitoring survey in the Kochi Backwaters onboard the State Inland Roll-On/Roll-Off (RoRo) Vessel for understanding its resident population, abundance and general behaviour.

### Outreach and Awareness

An online webinar titled "Ariviyal Palagai" was organized by Vigyan Prachar jointly with NIOT. 1 live talk has been delivered during the month.

Five days online training program in Artificial Intelligence and Machine Learning (AI/ML) for Atmosphere-Ocean Applications for Beginners (lecture cum hands-on) was conducted during 15-19 February 2021 for students and young scientists in MoES institutes and other academic institutions across the country. Total 107 researchers/ students participated.

The 6th phase of winter fog experiment (Nov 2020-Feb 2021) was conducted at Indira Gandhi International Airport, New Delhi and Hissar by IITM, Pune.

National Science Day was celebrated at all MoES institutes on 28th February 2021.

Crowd sourcing web page was launched by IMD during the month for reporting severe weather.

Half-Day Familiarization Workshop on Air Quality Early Warning System for officials of Central and State Pollution Control Boards was organized through virtual platform on 1st February, 2021 by IMD in collaboration with IITM Pune and Central Pollution Control Board (CPCB).

INCOIS organized 'Early Career Researchers' Symposium during February 02-03, 2021 as a part of 23rd Foundation day Celebration. The virtual event was attended by many senior scientists and researchers across MoES institutes and other national and international oceanographic institutions.

INCOIS conducted a Webinar on "Tsunami Preparedness and Implementation of Tsunami Ready" to Odisha Disaster Management Officials in coordination with Odisha State Disaster Management Authority (OSDMA) on 19<sup>th</sup> February 2021.

23 air warriors (related to Meteorology and Weather forecasting) of Indian Air Force visited NCMRWF for familiarization with weather modelling activities of NCMRWF on 15-Feb-21. NCMRWF organized one day introductory lecture series on various aspects of weather modeling for them.

NCMRWF scientists participated in the second MoES - United Kingdom Meteorological Office (UKMO) Weather and Climate Science for Service Partnership (WCSSP) India annual science workshop, held during 1-4 February 2021. Several scientists from other MoES institutes and UK universities associated with the project also participated in the science workshop.

A Virtual Training Programme on "Preparation of Weather Maps using Quantum Geographic Information System (QGIS)" and "Weather Bulletins Warning Graphics in Local Languages" under the chairmanship of Dr. M. Mohapatra, IMD, New Delhi was held on 24.02.2021.

### **Publications**

Subject	Publications			Ph.Ds		
	April 2020 - January 2021	February, 2021	Total	April 2020 - January 2021	February, 2021	Total
Atmospheric Sciences	196	30	226	4	-	4
Ocean Science and Technology	103	6	109	2	-	2
Polar Sciences	41	11	52	1	-	1
Geosciences and resources	27	17	44	0	-	0
Total	367	64	431	7	-	7

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

Vessel	Days at Sea / Utilization	Maintenance/ Inspection /Scientific Logistics / Cruise Preparation	No. of Cruise
Sagar Nidhi	15	13	1
Sagar Manjusha	0	28	0
Sagar Tara	9	19	1
SagarAnveshika	8	20	1
Sagar Kanya	0	28	0
SagarSampada	0	28	0

## Annex II

**File No.MoES/20/01/2017-Estt.**

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

Prithvi Bhavan, Lodhi Road  
New Delhi-110 003

Dated, the 1<sup>st</sup> March, 2021

### CERTIFICATE

(FOR THE MONTH OF FEBRUARY, 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 February, 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 | - 01 |

( Anju Bhalla )  
Joint Secretary  
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Signature Not Verified

Digitally signed by ANJU  
BHALLA  
Date: 2021.03.02 14:57:23 IST

