

**Ministry of Earth Sciences (MoES)**  
**Summary of Important Developments –March,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
18	07

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. Ministry of Earth Sciences organized a break out session of experts on 3<sup>rd</sup> March, 2021 chaired by Secretary, MoES on Deep Ocean Mission as a part of webinar on budget announcement. The recommendations from the session will be considered in the implementation phase of Deep Ocean Mission.
2. The draft Blue Economy policy document formulated by Economic Advisory Committee to PM has been circulated with all relevant stakeholders and concerned Ministries/departments including industry bodies for inputs/views. The draft blue economy policy is available on website of MoES for public consultation.
3. India is re-elected as a member of the Council of the International Seabed Authority (ISA), a body established under the United Nations Convention on Law of the Sea (UNCLOS), for a period of 4 years (Jan 2021 to Dec 2024) in the recently held elections.
4. The Chartered vessel MV Vasily Golovnin after resupplying fuel, food, provisions, medical equipment, spares, etc., to Bharati and Maitri Indian stations in Antarctica commenced its return voyage for Cape Town on 27 March 2021.
5. A Letter of Intent (LoI) was signed between Indian National Centre for Ocean Information Services (INCOIS) and the Shipping Corporation of India Ltd (SCI) for research and development towards ocean observation and forecasting services on 1 March 2021.
6. National Institute of Ocean Technology (NIOT) has been bestowed with the “Best Innovative Practices Award” along with a “Certificate of Appreciation” under Ships and Innovative Technology by the Confederation of Indian Industries held on 25<sup>th</sup> March, 2021 at Bangalore. 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)	351*		351
Automatic Rain Gauge (ARG)	403**	--	403

GPS Sonde based RS/RW (Radio Sonde/Radio Wind) Stations	56	--	56
Doppler Weather Radar (DWR)	28***	--	26
Ozone (Ozone Sonde + Total Ozone)	04	--	04
Surface Ozone (Electrochemical Concentration Cell method)	07	--	07
Nephelometer	12	--	11
Sky Radiometer	20	--	19
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)	---	--	3046
Aviation	79	--	79
Radiation Stations	46	---	46

\* Out of Total 724, 373 are outlived.

\*\* Out of total 1363, 960 are outlived.

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

## Modelling

Every week on all Thursdays during March 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.

NCMRWF started sending daily forecasts, the Sea-Ice related parameters for the South Polar Region (Antarctica) from NCMRWF coupled model from 17<sup>th</sup> Feb 2021. The forecasts were used for the movement of chartered ice class expedition ship 'Vasily Golovnin' used in NCPOR's 40<sup>th</sup> scientific expedition to Antarctica.

## Monthly Weather Summary (March 2021)

### a) Important Weather Events during the month

Low Pressure Systems: Twelve Western Disturbances and five induced cyclonic circulations affected Northwest India during the month of March 2021; fairly widespread rainfall/snowfall activity over Western Himalayan Region, Northwest and East India had occurred. Heavy to very heavy rainfall had occurred at isolated places over Jammu Kashmir & Ladakh, Assam & Meghalaya and Kerala & Mahe, Arunachal Pradesh, Tamil Nadu, Puducherry & Karaikkal.

Heat Wave: Heat wave to Severe heat wave conditions had occurred at some parts over Saurashtra & Kutch, Coastal Andhra Pradesh & Yanam, Tamil Nadu, Puducherry & Karaikkal, Gangetic West Bengal, Odisha, Konkan & Goa, Rajasthan, Himachal Pradesh, Gujarat, Madhya Pradesh, West Uttar Pradesh, Jharkhand and Vidarbha.

**b) Rainfall Scenario:** The rainfall for the country as a whole for the month of March 2021 has recorded as 16.7 mm which is 55% lower than its Long Period Average (LPA) of 30.4mm.

### c) Heavy Rainfall Events:

Warning issued for	No. of Heavy/Very Heavy Rainfall Events (>64.4 mm): 10
	Percentage correct (in %) for Rainfall >64.4mm
Day1 / 24 Hours	98%
Day2 / 48 Hours	98%
Day3 / 72 Hours	98%

**d) Temperature Scenario:** The Mean Temp for the month of March 2021 for the country as a whole was 26.3°C; which was above normal by +1.24°C. The highest maximum temperature of 44.6°C had been recorded at Baripada (Odisha) on 30<sup>th</sup> March, 2021 and the lowest minimum temperature of 5.4°C had been recorded at Udaipur (East Rajasthan) on 2<sup>nd</sup> March, 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	17	25, 27 and 29 March	Nil	Nil
2.	Northwest India	18	23 March	5 (Shimla on 8, Qazigubnd, Katra&Bhaderwah on 22 and Batote on 23 March)	1 (Dehradun on 8 March)
3.	Northeast India	19	9 March	1 (Tezpur on 29 March)	Nil
4.	East India	15	13 March	6 (Jalpaiguri&Bankura on 10, Pakyong on 11, Gangtok on 18 & 24 and Tadong on 24 March)	Nil
5.	Central India	12	12 March	3 (Sagar on 12 and Ambikapur on 12 & 13 March)	Nil
6.	West India	06	21 March	1 (Old Mahableshwar-Media Report)	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, Mountain weather bulletins including severe weather warnings for Western and Central Himalayan region:- 62, Marine Weather Bulletins:- 62, Nowcast Guidance Bulletins for severe weather:- 31, Tropical Weather Outlook to WMO/ WSCAP Panel member countries for the north Indian Ocean:- 31, Bulletins of the Severe Weather Forecast Programme (SWFP):- 31, Extended range outlook on Cyclogenesis:- 4, FDP bulletin for winter weather system: 31.

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

- i) ENSO bulletin for March 2021 and Seasonal Climate Outlook for South Asia for the month of March to June 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) Four weekly and cumulative Standardized Precipitation Index (SPI) maps were prepared for the weeks ending 03.03.2021, 10.03.2021, 17.03.2021, 24.03.2021 and 31.03.2021 and supplied for use in Agromet Advisory Services Bulletin. The same have also been uploaded in IMD Pune website.
- iii) Daily all India Weather summary and Weekly Weather Reports are being brought out on routine basis.
- iv) Monthly and cumulative Standardized Precipitation Index (SPI) maps were prepared for the month ending March 2020 for use in Climate Diagnostic Bulletin of India. The same have also been uploaded in IMD Pune website.
- v) Gridded standardized Precipitation Index (SPI) and 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 the aforementioned timescales are being uploaded at weekly basis on IMD Pune website.
- vi) Temperature Outlook for April to June season 2021 updated and released on 31st March 2021.

- vii) ENSO bulletin for March 2021 and Seasonal Climate Outlook for South Asia for the month of March to June 2021 were issued.
- viii) Climate Summary for winter (Jan-Feb) season and for the month of February 2021 was issued.
- ix) The Operational air quality forecast and early warning for Delhi forecast is being issued every day by Indian Institute of Tropical Meteorology (IITM), Pune.

Important Press Releases: Forecast for Uttarakhand:- 31, Seasonal Outlook for the Temperatures during March to May, 2021:- 2 (both in English & Hindi), Monthly Weather Review for Feb 2021 and Weather Outlook for March 2021: -1, Climate Summary for Winter (Jan-Feb) season and for the month of February 2021: - 1, current weather status and outlook for two weeks:-4.

### **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: 116 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 March, 2021	Data received during March, 2021
Argo Floats *	200	374	110
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)	29
2	Tuna Fishing Advisories	28
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

### **Marine Living Resources**

The faunistic expedition to the Andaman Sea during cruise no. 388 yielded 1 first zoogeographical record of the reef-associated mantis shrimp *Odontodactylus hawaiiensis* Manning, 1967 for the Indian waters. This species is previously known only from Hawaii and is only the second record so far, collected with a chain dredge at 53 m depth.

*Briarosaccus callosus*, a widely distributed parasite of king crab, has been reported from various species all over the world. So far only two species have been identified as its host, naming *P. granulosa* and *P. anamare* from *Paralomis* genus. *Paralomis indica* is the third host for this parasite identified for the first time from Indian Exclusive Economic Zone (EEZ).

## **Outreach and Awareness**

NIOT conducted COVID vaccination camp on 18<sup>th</sup> March 2021, for all their employees, their families and service providers.

A five (5) day training course on “Visualization of Marine Met data (using FERRET)” was conducted by International Training Centre for Operational Oceanography (ITCOcean), Indian National Centre for Ocean Information Services (INCOIS) during 15-19 March 2021. Around hundreds (100) participants from 11 Indian Ocean countries attended this online course.

India Meteorological Department (IMD) celebrated World Meteorological Day: Azadi Ka Amrit Mahotsav on 23<sup>rd</sup> March, 2021. Secretary, MoES inaugurated Climate Data Services Portal of IMD on this occasion. He also released Standard Operation Procedures (SOPs) & Brochures of IMD. NCMRWF and Institute of Management Studies, Noida chapter organized an online program on 23<sup>rd</sup> March 2021 with theme -The Oceans, Our Climate and Weather Program. More than 60 people attended the online event.. Indian Institute of Tropical Meteorology (IITM), Pune celebrated the World Meteorological Day, and organised a special online lecture on the topic “Societal Benefits of Ocean Information Services” in line with the World Meteorological Organization (WMO) Day 2021 theme “the ocean, our climate and weather”. An E-Symposium on “The Ocean, Our Climate and Weather” was organised by Indian Meteorological Society (IMS) and Ocean Society of India (OSI) on World Meteorological Day on 23<sup>rd</sup> March, 2021.

IITM, Pune and the World Weather Research Programme / World Climate Research Programme WWRP/WCRP Sub seasonal-to-Seasonal (S2S) Prediction Project of WMO jointly organized a Virtual International Conference on the "Future directions of Sub-seasonal to Seasonal Prediction over South Asia" during 29-31 March 2021 at IITM, Pune.

One day training on verification of AWS was conducted at Meteorological Centre (MC) Bhubaneswar on 26.03.2021. Block Agriculture Officer/ Assistant Agricultural Officer (AAO) from different districts of the state attended the Training Programme.

A training course on ‘Visualization of Marine Met data (using FERRET) was started with 100 participants from 11 Indian Ocean Countries by International Training Centre for Operational Oceanography (ITCOcean), INCOIS. This online course was conducted for 5 days till 19<sup>th</sup> March, 2021.

On March 19, 2021 National Centre for Coastal Research (NCCR) celebrated its Foundation Day. The function was graced by Secretary, MoES, Dr. M. Rajeevan and former Secretary, Dr. S.R. Nayak. The Foundation Day Lecture was delivered by Dr. Sidney Thurston of National Oceanic and Atmospheric Administration (NOAA), USA.

The International Women’s Day was celebrated at MoES and its institutions on March 8, 2021.

## **Publications**

Subject	Publications			Ph.Ds		
	April 2020 - February 2021	March, 2021	Total	April 2020 - February 2021	March, 2021	Total
Atmospheric Sciences	226	29	255	4	0	4
Ocean Science and Technology	109	11	120	2	0	2
Polar Sciences	52	4	56	1	0	1
Geosciences and resources	44	13	57	0	0	0
Total	431	57	488	7	0	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	26	5	3

Sagar Manjusha	0	31	0
Sagar Tara	0	31	0
SagarAnveshika	11	20	1
Sagar Kanya	0	31	0
SagarSampada	0	31	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 April, 2021

### CERTIFICATE

(FOR THE MONTH OF APRIL, 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 March, 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: 2021.04.05 18:46:00 IST

