

Ministry of Earth Sciences (MoES)
Summary of Important Developments – November, 2020

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 |
|-----------------------------------------------------|----------------------------------------------------------|
| 11 | 01 |

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. Honorable Minister of Earth Sciences (HMoES) released the National Council of Applied Economic Research (NCAER) report on “Estimating the economic benefits of Investment in Monsoon Mission and High Performance Computing facilities” on 03rd November, 2020. The NCAER report refers to economic benefits as direct monetary gains to crop farmers, livestock readers, and fishermen in the country. On this occasion, HMoES signed a plaque on 70 years of India’s constitution at MoES, Prithvi Bhawan, New Delhi.
2. New Meteorological Centre (MC) was established at Leh, Ladakh during November 2020 to cater to the needs of Ladakh region.
3. National Centre for Medium Range Weather Forecasting (NCMRWF) has implemented an updated version of very high resolution (330 m) Fog Model over Delhi and adjoining region, for prediction of winter fog and associated visibility in the forthcoming winter season.
4. A sharp decline of 60–65% in NO₂ levels and 30–50% in fine particulate matter PM_{2.5} and PM₁₀ levels has been observed while comparing the SAFAR(System of Air Quality and Weather Forecasting And Research) data of the major pollutants collected immediately after lockdown to those collected during (2013 to 2019). The results are likely to have implications to policy framework and control strategies.

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* | 1- MC Leh 1- Kargil | 292 |
| Automatic Rain Gauge (ARG) | 357** | 1 -West Tambaram Distt. Chengalpattu | 313 |
| GPS Sonde based RS/RW (Radio Sonde/Radio Wind) Stations | 56 | -- | 56 |

| | | | |
|--------------------------------------------------------------------------------------------|---------------------------------------------|-----|---------------------------------------------|
| Doppler Weather Radar (DWR) | 25*** | -- | 24 |
| Ozone (Ozone Sonde + Total Ozone) | 04 | -- | 04 |
| Surface Ozone (Electrochemical Concentration Cell method) | 07 | -- | 07 |
| Nephelometer | 12 | -- | 12 |
| Sky Radiometer | 20 | -- | 16 |
| Black Carbon Monitoring Systems (Aethalometer) | 25 | -- | 22 |
| 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) | --- | -- | 3195 |
| Aviation | 79 | -- | 79 |
| Radiation Stations | 46 | --- | 46 |

* Out of Total 724, 400 are outlived.

** Out of total 1357, 1000 are outlived.

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

High Wind Speed Recording Systems (HWSR) installed at Dwarka, Kalingapatnam and Naliya during the month.

Modelling

Every week on all Thursdays during November 2020, 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), and Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) countries.

Monthly Weather Summary (November 2020)

a) Important Weather Events during the month

Low Pressure Systems: During the month, two low pressure systems have been formed namely Gati and Nivar during 21-24 November 2020 and 21-27 November 2020 including one over central parts of south Arabian Sea and another one over Equatorial Indian Ocean (EIO) & adjoining central parts of south Bay of Bengal (BoB). These systems concentrated into a depression over the same region and have caused intense to very intense rainfall activity over north Somalia, north Tamil Nadu & Puducherry, Rayalseema and south coastal Andhra Pradesh. For the first time India Meteorological Department (IMD) indicated landfall area of the cyclone, when the system was in the stage of low pressure area. One more low pressure area has been formed over East central Bay of Bengal adjoining Myanmar coast on 31st Oct caused isolated heavy rain over Nagaland, Manipur, Mizoram & Tripura and Assam & Meghalaya.

b) Rainfall Scenario: The rainfall for the country as a whole for the month of November 2020 has recorded as 29.2mm which is 4% 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): 186 |
| | Percentage correct (in %) for Rainfall >64.4mm |
| Day1 / 24 Hours | 96% |
| Day2 / 48 Hours | 96% |
| Day3 / 72 Hours | 96% |

d) Temperature Scenario: The Mean Temp for the month for the country as a whole was 23.48°C; which was above normal by +0.26°C. The highest Maximum temperature of 40.9°C had been recorded at Churu (West Rajasthan) on 3rd October 2020 and the lowest minimum temperature of 4.1°C had been recorded over Churu (West Rajasthan) on 29th November 2020 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 | 25 | 04-11-20 | Nil | Nil |
| 2. | Northwest India | 05 | 15-11-20 | Nil | Nil |
| 3. | Northeast India | 08 | 17-11-20 | Nil | Nil |
| 4. | East India | 02 | 20-11-20 & 21-11-20 | Nil | Nil |
| 5. | Central India | 05 | 18-11-20 | Nil | Nil |
| 6. | West India | 0 | - | Nil | Nil |

Bulletins/Warnings/Press Releases Issued:

All India Weather Bulletins – 120 (issued four times daily), All India weather inference and severe weather warnings – 120 (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 – 60, Marine Weather forecast Bulletins: 60, Tropical Weather Outlook for the north Indian Ocean – 30, Bulletins of the Severe Weather Forecast Programme -30, Nowcast Guidance Bulletins for severe weather:- 30, Related to Low Pressure Area/Well marked Low/Depression/Cyclones over Arabian Sea/ Andaman Sea/ Bay of Bengal: 15, Related to Monthly Weather Review for the month of Oct, 2020: 1, Related to enhanced rainfall activity over Southeast peninsular India during 11th-17th November 2020: 1, Related to Seasonal Outlook for the Temperatures during December 2020 to February 2021: 2 (in English & Hindi).

Publications & Operational Reports:

- i) Daily All India Weather Summary and Weekly Weather Reports are being brought out on routine basis.
- ii) Four (4) weekly and cumulative Standardized Precipitation Index (SPI) maps were prepared for the weeks ending 04, 11, 18 & 25 November 2020 prepared and uploaded at IMD Pune website.
- iii) Gridded Standardized Precipitation Index (SPI) & Standardized Precipitation Evapotranspiration Index (SPEI) at 0.5 x 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.
- iv) El Niño–Southern Oscillation (ENSO) bulletin for November 2020 and Seasonal Climate Outlook for South Asia for the months of November 2020 to February 2021 were issued. (Quick Link: www.imdpune.gov.in/Clim_Pred_LRF_New/Products.html).

Seismological Observational Network

| Observation Type | Target | Commissioned so far | Data reporting during the month |
|------------------|--------|---------------------|---------------------------------|
| Seismic stations | 115 | 115 | 102 |
| 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: 111 earthquakes were monitored in the Indian region out of which 4 events were greater than magnitude (M) of 5.0.

Tsunami: No seabed earthquakes (M> 6) with a potential to generate tsunami occurred.

Ocean Observation System

| Type of Platform | Target | Commissioned till November, 2020 | Data received during November, 2020 |
|------------------------------------------|--------|----------------------------------|-------------------------------------|
| Argo Floats * | 200 | 374 | 132 |
| Moored Buoys | 16 | 19 | 11 |
| Tide Gauges | 36 | 36 | 29 |
| High Frequency (HF) Radars | 10 | 12 | 8 |
| 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) | 28 |
| 2 | Tuna Fishing Advisories | 23 |
| 3 | Ocean State Forecast (OSF)-Wave, Wind, Currents, SST (Sea Surface Temperature), MLD (Mixed Layer Depth) and D20 forecasts | 30 |
| 4. | Real time global ocean analysis (daily) | 30 |
| 5. | Coral Bleaching Alert System | 10 |

Outreach and Awareness

A webinar on "Hydrodynamics of beach placer deposits and their sustainable exploitation – Way forward" was conducted on 23rd November 2020 for researchers and the scientific community.

NCMRWF organized the curtain raiser event (on 27th Nov 2020) for upcoming India International Science Festival (IISF)-2020. The programme was streamed live via You Tube where a good number of students and young researchers attended the interactive session.

Vigilance Awareness Week was observed at MoES and its institutes including attached and subordinate offices from 27th October 2020 to 02nd November 2020 and the "Integrity Pledge" was administered to the employees. Various competitions were conducted to evoke vigilance awareness

Constitutional Day was observed on 26th November 2020.

As an initiative by the MoES, Indian Institute of Tropical Meteorology (IITM) organized "Earth Sciences Popular Lectures" webinar series in coordination with MoES & its Institutions. One talk was delivered in the month of November, 2020.

Another live talk of the MoES Webinar Series on "Jan-Jan-Ke-Liye-Vigyan" in Hindi on the "Role of MoES in the field of seismological instrumentation" was delivered in the month of November, 2020.

On the occasion of World Tsunami Awareness Day (WTAD), Indian National Centre for Ocean Information Services (INCOIS) conducted a Webinar on "Tsunami Awareness & Preparedness" in coordination with the National Disaster Management Authority (NDMA) and Odisha State Disaster Management Authority (OSDMA). Around 190 participants from Coastal disaster management organizations, scientific and academics institutions attended this webinar.

IITM Pune Institute celebrated its 59th Foundation Day on 17 Nov 2020 through virtual mode.

Publications

| Subject | Publications | | | Ph.Ds | | |
|---------------------------------|-----------------------|-------------------|-------|-----------------------|-------------------|-------|
| | April-October 2020 | November, 2020 | Total | April-October 2020 | November, 2020 | Total |
| Atmospheric Sciences | 137 | 17 | 154 | 4 | 0 | 4 |
| Ocean Science and Technology | 82 | 6 | 88 | 1 | 1 | 2 |
| Polar Sciences | 32 | 0 | 32 | 1 | 0 | 1 |
| Geosciences and resources | 18 | 3 | 21 | 0 | 0 | 0 |
| Total | 269 | 26 | 295 | 6 | 1 | 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 | 25 | 05 | 2 |
| Sagar Manjusha | 0 | 30 | 0 |
| Sagar Tara | 09 | 21 | 1 |
| Sagar Anveshika | 0 | 30 | 0 |
| Sagar Kanya | 0 | 30 | 0 |
| Sagar Sampada | 07 | 23 | 1 |

Annex II

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

Prithvi Bhavan, Lodhi Road
New Delhi-110 003


Dated, the 2nd December, 2020

CERTIFICATE

(FOR THE MONTH OF NOVEMBER, 2020)

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 November, 2020. 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 | - 01 |
| (d) | Number of posts under additional charge arrangement | - 01 |
| (e) | Number of posts that would fall vacant during the next 6 months | - 00 |


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