

Ministry of Earth Sciences (MoES)
Summary of Important Developments –January,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 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, 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
32	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 have been updated on AVMS:** 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 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:

- Drilling below the seafloor using Autonomous coring system was carried by National Institute of Ocean Technology(NIOT), an autonomous institute under Ministry of Earth Sciences in Krishna-Godavari Basin, Bay of Bengal to depth of 101m below the sea floor in 230 m water depth and to 60m below the sea floor at 1060m water depth.
- The Central Indian Ocean (IOCINDIO) Leadership Workshop for Developing the “Regional Framework for Coastal Vulnerability towards the Safety, Security & Sustainable Development of Member States in the Indian Ocean” was conducted at NIOT Chennai during 06-07 Jan 2020.
- Towards the UN decade of Ocean Science for sustainable development (2021-2030), a "Regional Planning Workshop for Northern/Central Indian Ocean Countries & ROPME Sea Area", was conducted during 8-10 January 2020 at NIOT, Chennai. The workshop attracted a large number of accomplished senior scientists, professionals & students from more than 15 countries from the Indian Ocean region & outside.

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 mode. Presently, 40.1 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)	*302 (702-400)	02	223
Automatic Rain Gauge (ARG)	1356	--	352
GPS Sonde based RS/RW Stations	56	--	56
Doppler Weather Radar (DWR)	* 25	--	25
Ozone (Ozone Sonde + Total Ozone)	04	--	03
Surface Ozone (<u>Electrochemical Concentration Cell</u> method)	07	--	07
Nephelometer	12	--	12

Sky Radiometer	20	--	19
Black Carbon Monitoring Systems (Aethalometer)	25	--	23
Air Quality Monitoring System (SAFAR)	10(Delhi) 10(Mumbai) 10(Ahmedabad)	--	10(Delhi) 10(Mumbai) 10(Ahmedabad)
Hydromet. (IMD & Extra-departmental excluding AWS & ARG)	---	--	2925
Aviation	79	--	79
Radiation Stations	45	--	38

* Includes 2 Doppler Weather Radar of ISRO.

Atmospheric Processes, Modelling and Services

Temperature Scenario: The Mean Temp for the month for the country as a whole was 19.65°C; this was slightly above normal (+0.005°C).

- Severe cold wave conditions have been observed at a few places over Haryana, Chandigarh & Delhi and Rajasthan on one day. It has been observed at isolated places over Odisha, Haryana, Chandigarh & Delhi, Jammu & Kashmir, Himachal Pradesh, Madhya Pradesh and Vidarbha on one or two days during the month.
- Severe cold day conditions prevailed at many places over Bihar on one day; at a few places over West Rajasthan and Madhya Pradesh on one day; at isolated places over East Uttar Pradesh on three days; over Uttar Pradesh, Haryana, Chandigarh & Delhi, Madhya Pradesh and West Rajasthan on one or two days during the month.
- The lowest minimum temperature of -0.6 °C had been recorded at Kota (East Rajasthan) on 20th January 2020 over the plains of the country during the month.

Heavy Rainfall Activity: No. of Heavy/Very Heavy Rainfall Events (>64.4 mm) and Warning Skill (correctness in %) of spatial distribution in issued warnings during the month is given below:

Lead Time of warning issued	No. of Heavy Rainfall Events (>64.4 mm): 15	
	correctness in % (Rainfall >64.4mm)	
24 Hour	98%	
48 Hour	98%	
72 Hour	98%	

Rainfall Scenario: The rainfall for the country as a whole for the month of January 2020 has been recorded as 28.1 mm which is 63% above to its Long Period Average (LPA) i.e., 17.3 mm.

Western Disturbance and Easterly wave along with associated weather:

- Ten numbers of Western Disturbances (WDs) have affected the NW India during the month, which is of very higher numbers compared against normal of 3-4 WDs for January month. These WDs have caused fairly widespread to widespread rainfall/snowfall with isolated intense rainfall activity over Western Himalayan Region. Three among these WDs have caused scattered to fairly widespread rainfall/thunderstorm activity along with isolated hailstorm over the adjoining plains of NW India.
- Remnants of these Western Disturbance as well as movement of trough in low level westerlies have caused scattered to fairly widespread rainfall/thunderstorm activity over parts of East & Northeast India with intense activity at isolated places during the month.
- Movement of an active easterly wave has caused heavy rainfall over Tamil Nadu, Puducherry & Karaikal and Kerala in the first week of the month.

Thundersquall & Hailstorm activity: Thundersquall & Hailstorm activity during 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	05	02-01-20 & 03-01-20	Nil	Nil
2.	Northwest India	15	08-01-20	Pantnagar & Tehri on 02-01-20 & 04-01-20, Patiala, Dehradun, Tehri on 13-01-20, Batote on 15-01-20, and Dehradun, Mukteshwar, Tehri on 18-01-20	Nil
3.	Northeast India	08	19-01-20	Nil	Nil
4.	East India	08	09-01-20	Gangtok, Darjeeling on 05-01-20, Gangtok on 30-01-20	Nil
5.	Central India	09	08-01-20	Satna on 08-01-20	Nil
6.	West India	Nil	Nil	Nil	Nil

Note: The convective activities mentioned above had been predicted and corresponding warnings were issued about 4-5 days in advance of the occurrence of the event. In addition to that, nowcasts were also given by corresponding RMCs/MCs with respect to these events.

Bulletins / Operational Reports/ Services

Bulletins/Warnings/Press Releases Issued: All India Weather Bulletins(124), All India inference and severe weather warnings(124), Press Releases related to related to (a) intense rainfall activity(4),(b) Related to Fog, Cold Wave & Cold Day(1),(c)current weather status and outlook for next two weeks (3),(d)Statement on Climate of India during 2019(1), Nowcast Guidance Bulletins for severe weather (31), All India Weekly Weather Reports (5), Mountain weather bulletins including severe weather warnings for western and central Himalayan region(62),

Publications & Operational Reports issued: Monsoon 2019 RMC Mumbai Report , Pre-monsoon Thunderstorms during 2019, Met Monograph: Monsoon Report 2019, Daily All India Weather Summary and Weekly Weather Reports, El Nino Southern Oscillation (ENSO) bulletin for the month of December 2019 ,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, Climate Diagnostics Bulletin of India for November and December 2019 uploaded on IMD Pune website., ENSO bulletin for January 2020 and Seasonal Climate Outlook for South Asia for the month of January to April 2020 (Quick Link: www.imdpune.gov.in/Clim_Pred_LRF_New/Products.html), Four weekly and cumulative Standardized Precipitation Index (SPI) maps prepared for the weeks ending 01.01.2020, 08.01.2020, 15.01.2020, 22.01.2020 and 29.01.2020 and uploaded in IMD Pune website.

Geoscience Research

Seismological Observational Network

Observation Type	Target	Commissioned so far	Data reporting during the month
Seismic stations	115	115	105
GPS stations	40	20#	19

#10 VSATS have been dismantled to shift them to new locations.

Earthquake and Tsunami monitoring

Earthquake: 27 earthquakes were monitored in the Indian region out of which 5 events were greater than magnitude (M) of 5.0.

Tsunami: 3 seabed earthquakes (M> 6) with a potential to generate tsunami occurred. This information was provided within 12minutes of occurrence forboth the events.

Ocean Observation System

Type of Platform	Target	Commissioned till November, 2019	Data received during November, 2019
Argo Floats *	200	368	146
Drifters*	150	108	5
Moored Buoys	16	22	17
Tide Gauges	36	36	31
High Frequency(HF) Radars	10	12	9
Acoustic Doppler Current Profiler(ADCP)	20	20	17
Tsunami Buoys	7	9	3
Wave Rider Buoy	16	24	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)	31
2	Tuna Fishing Advisories	29
2	Ocean State Forecast(OSF)-Wave, Wind, Currents, SST, MLD and D20 forecasts	31
4.	Real time global ocean analysis (daily)	31
5.	Coral Bleaching Alert System	11

Topographic Survey of Exclusive Economic Zone

Area covered during the month:= 8,700 sq km

Marine Living Resources Programme (MLRP)

The recent faunistic expedition to the Andaman Sea yielded 1 zoogeographical record of the reef-associated mantis shrimp *Chorisquillainquelobata*(Gordon, 1935) which is previously known only from the Christmas Island in the Indian Ocean and is only the second record so far.

The collections by scuba diving at a depth of 12m at Agatti waters yielded two new records of Heterobranchs (Class Gastropods, Phylum Mollusca) *Baeolidiamoebii* and *Diniatysdubia*. *Baeolidiamoebii* is previously known from Philippines, Marshall Island, Hawaii, Turkey and *Diniatysdubia* from Borneo, Guam, Indonesia, Papua New Guinea and Hawaii.

The rediscovery of an Ascidiian *Ecteianscidiabombayensis* after 92 years was reported from the Gujarat (Okha) coast. Ascidiians commonly termed as Sea Squirts are the largest and diverse class of Sub Phylum Tunicata found in marine habitats ranging from shallow water to deep sea.

Capacity Building and Outreach

During 6-10 Jan 2020, NCMRWF organized a weeklong training course Advanced NWP and Modelling, for the visiting students (M. Tech Geophysics) of Banaras Hindu University Varanasi.

One day workshop on 'National Information System for Climate and Environment Studies (NICES) and its Activities' organized by National Remote Sensing Centre (NSRC), ISRO, Hyderabad in association with Indian Meteorological Society, Pune Chapter(IMSP) and IITM Pune, was held at IITM on 8 January 2020.

Utilization of Ocean Research Vessels during the month

Vessel	Days at Sea / Utilization	Maintenance/ Inspection /Scientific Logistics / Cruise Preparation	No. of Cruise
Sagar Nidhi	10	21	2
SagarManjusha	18	13	2

Sagar Tara	16	15	2
Sagar Kanya	22	9	2
SagarSampada	14	17(maintenance)	395

Subject	Publications			Ph.Ds		
	April- November, 2019	December, 2019	Total	April- November, 2019	December, 2019	Total
Atmospheric Sciences	136	11	147	2	2	4
Ocean Science and Technology	76	16	92	1	-	1
Polar Sciences	19	11	30	-	-	-
Geosciences and resources	16	3	19	2	-	2
Total	247	51	298	5	2	7