Ministry of Earth Sciences (MoES)
Summary of Important Developments –January,2018

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.	Dt 14/08/2014 PROPOSAL FOR KRILL FISHING 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 MoESwill study legislations enacted by other member countries before finalising the draft legislation as part of international convention obligations. 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.	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.	There is no response from the private industries for a long time. Accordingly, it is proposed to close this item for monthly reporting. As and when the response is received, the same will be reported.

- **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
29	29

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

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Annex-I

Important policy decision taken and major achievements:

i. India's first Multi Petaflop Supercomputers "PRATYUSH" and "MIHIR" HPCSystem were inaugurated and dedicated to Nation by Dr. Harsh Vardhan, Hon'ble Union Minister for Science & Technology, Earth Sciences and Environment, Forest and Climate Change at IITM Pune and NCMRWF Noida.

ii. With the augmentation of this new high performance computing (HPC) facility of 6.8 Peta Flops (PF), India's ranking moves from the 368th position to around the top 30 in the Top 500 list of HPC facilities in the world. India will also be placed at the 4th position after Japan, UK and USA for dedicated HPC resources for weather/climate community. The new HPC of 6.8 PF computational power was installed at two MoES Institutes: 4.0 Peta Flops HPC facility at IITM, Pune and 2.8 Peta Flops facility at NCMRWF, Noida. The HPC facility inaugurated will be used for carrying out research on improving weather and climate forecasts and its applications.

iii. The 10th Southern Ocean Expedition spanning over 60 days was launched from Port Louis, Mauritius to have a comprehensive study in the Antarctic Zone (AZ). The focal scientific themes of this expedition are atmospheric sciences, water column dynamics, biogeochemistry, food-web dynamics and paleoclimatic studies with special emphasis on the AZ. The study is expected to augment our understanding of the influence of SO ecosystem on the tropical climatic variations.

iv. Memorandum of Understanding (**MoU)** was signed on 11 January 2018 between Indian Institute of Tropical Meteorology(IITM), Pune and Madhya Pradesh Council of Science & Technology for the establishment of Atmospheric Research Testbed facility in central India. Data sets from this facility will help in better understanding physical processes relating to convection, clouds and other atmospheric phenomenon and parameterize them which will lead to improvements in weather and climate predictions.

Minimum Government, Maximum Governance:

Dissemination of Agromet. Advisories to users community through SMS and IVR technology is being continued in the country through Kisan Portal and under PPP mode. Presently 21.69 Million farmers in the country getting advisories through SMS directly.

Adverse weather SMS warning are being sent through mobiles to State Govt. officials / Disaster related officials /Central Govt. Organization/Common men.

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	Data Reporting
Automatic Weather Station (AWS)	682	343
Automatic Rain Gauge (ARG)	1350	596
GPS Sonde based RS/RW Stations	43	30
Doppler Weather Radar (DWR)	25	25
Surface Ozone over Delhi (Electrochemical Concentration Cell)	07	07
Nephelometer	12	12
Sky Radiometer	19	15
Black Carbon Monitoring Systems (Aethalometer)	16	15
Hydromet. (IMD &Extra-departmental excluding AWS &ARG)	---	2361@
Aviation	76	76

@ Data received from various agencies viz. Air Force, Railways, Central Water Commission, State Agriculture, State Irrigation and India Meteorological Department (IMD)

Atmospheric Processes, Modeling and Services

Rainfall in January, 2018

Rainfall during the month of January, 2018 was large excess in 1, excess in 0, normal in 0, deficient in 3, large deficientin 16 and no rain in 16 of 36 meteorological sub- divisions. The rainfall for the country as a whole for the month has been recorded as 2.9 mm (-85%) against the Long Period Average of 19.2 mm.

The Northeast Monsoon (Oct-Dec 2017) rainfall has ceased over Tamil Nadu & Puducherry, Kerala and adjoining parts of Andhra Pradesh and Karnataka from 15th January 2018. The realized NE monsoon rainfall over South Peninsula is 86 % of its Long Period Average (LPA) as against IMD's operational forecast of 89% -111% of LPA and 90% for Tamil Nadu as against IMD's operational forecast of 88% -112% of LPA.

Significant weather events:

Western Disturbances and associated weather:

Nine (9) active Western Disturbances (WDs) as against 5-6 WDs expected during the month passed across western Himalayan region and adjoining plains of northwest India during the month. One WD caused fairly widespread to widespread rainfall and thunderstorm activity over the plains during 22nd -23rd January, 2018 with peak activity on 23rd January.

Fairly widespread to widespread dense to very dense fog was observed over East Uttar Pradesh and Bihar on most of the days during the month leading to prolonged cold day to severe cold day conditions. Dense to very dense fog was observed at a few places over Punjab, Haryana, West Uttar Pradesh,Chandigarh & Delhi on most days resulting into cold day to severe cold day conditions. Cold wave to severe cold wave conditions was observed at a few places over Punjab,

Haryana, north Rajasthan, Uttar Pradesh and Bihar and at isolated places over Madhya Pradesh, Vidarbha, Telangana, Jharkhand, Gangetic West Bengal and Odisha on a few days during the month. The lowest minimum temperature of 0.0º C recorded at Sikar (East Rajasthan) on 3rd and 16th January, 2018 during the month. The lowest maximum temperature of 10.2º C was recorded at Shahjahanpur (West Uttar Pradesh) on 12th January 2018 during the month.

Fog: For the month of January 2018, the Probability of Detection (PoD) of FOG based on Warning for Indo-Gangetic Plains including Northeastern states was 92% for Day 1, 91% for Day 2 and 81% for Day 3**.**

Heavy Rainfall Verification for the month**:**

Total No. of Heavy Rainfall events(>64.4mm in 24 hrs ending at 0830 hrs IST of date): 3

Lead time of forecast→	24 hour	48 hour	72 hour
Percentage correct	99	100	100

National Centre for Medium Range Weather Forecasting (NCMRWF) continued to issue daily model based weather and ocean forecast guidance for (i) Southern Ocean Scientific Expedition of India to cater to science planning and route optimization and(ii) ongoing 'Navika Sagar Parikrama – INSV TARINI' expedition through South Pacific and Southern Ocean stretch by all-women crew of Indian Navy.

The commissioning of the instrument used for reporting the runway visual range, indigenously designed and jointly developed by IMD & CSIR-National Aerospace Laboratories (CSIR-NAL) called as **DRISHTI** was extended to Bengaluru International Airport.

Geoscience Research

Seismological Observational Network

Observation Type	Target for XII Plan	Commissioned so far	Data reporting during the month
Seismic stations	130	102	54
GPS stations	40	28	21

Earthquake and Tsunami monitoring

Earthquake: 19 earthquakes were monitored in the Indian region out of which 6 events were greater than magnitude (M) of 5.0.

Tsunami**:** 3 major seabed earthquakes (M> 6) with a potential to generate tsunami were monitored. This information was provided within 12 minutes of occurrence.

Ocean Observation System

Type of Platform	Target	Commissioned till January, 2018	Data received during January, 2018
Argo Floats *	200	313	150
Drifters*	150	108	4
Moored Buoys	16	19	19
Tide Gauges	36	34	27
High Frequency(HF) Radars	10	10	10
Current Meter Array	10	11	2
Acoustic Doppler Current Profiler(ADCP)	20	20	15
Tsunami Buoys	7	9	6

Wave Rider Buoy	16	17	10

*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	23
2	Ocean State Forecast(OSF)-Wave, Wind, Currents, SST, MLD and D20 forecasts	31
3.	Near Real time global ocean analysis (5-day averaged)	6
4.	Real time global ocean analysis (daily)	31
5.	Coral Bleaching Alert System	10

INCOIS in collaboration with ISRO developed a dissemination service to provide the INCOIS services (OSF, PFZ, Tsunami warning) through the NaviC satellite system. The successfultest disseminations were carried out to the fishing boats in Kerala during Jan 04-06, 2018 on trial basis.

A special user interaction session was organized in Malayalam at CMFRI during SAFARI-2 symposium. This session aimed at facilitating communication with fishermen in the background of the recent cyclone Ockhi.

Ocean Technology

A state of the art research facility cum Administrative Building & Staff Quarters was inaugurated at Port Blair to support the Ocean Science and Technology needs of the Islands.

A patent was filed on a buoyant apparatus for performing rescue operation and remote data collection by National Institute of Ocean Technology.

Capacity Building and Outreach:

Under the India UK Water Centre (IUKWC), IITM, Pune, first User Engagement Initiative (UEI) organized a knowledge exchange event targeted towards specific stakeholders to demonstrate the utility of India-UK joint water security science. The theme of the first UEI is "Improving freshwater monitoring frameworks and data for research and management", held at Kochi, Kerala during 23 – **25th** January 2018 and this event focused on Regional Water Policy and Management Bodies in southern India. The event involved presentations by experts and stakeholders around four areas of water security science, (i) Water Supply and management (ii)Water Quality (iii) Ecotourism and freshwater Biodiversity (iv) Irrigation.

Utilization of Ocean Research Vessels during the month

Vessel	Days at Sea / Utilization	Maintenance/ Inspection /Scientific Logistics / Cruise Preparation	No. of Cruise	No. of Port Calls / Port Stay/ Statutory survey
Sagar Nidhi	29	2	2	-
Sagar Manjusha	24	7	3	-
Sagar Purvi	18	13	3	-
Sagar Kanya	25	6	2	-
Sagar Sampada	25	6	2	-

Publications in Science Citation Index(SCI) journals and PhDs awarded

Subject	Publications			Ph.Ds		
	April – December 2017	January, 2018	Total	April – December, 2017	January, 2018	Total
Atmospheric Sciences	109	19	128	8	-	8
Ocean Science and Technology	41	2	43	1	1	2
Polar Sciences	13	-	13	1	-	1
Geosciences and resources	13	-	13	1	-	1
Total	176	21	197	11	1	12

Annex II

Ministry of Earth Sciences

CERTIFICATE

(For the month of January, 2018)

It is certified that the detailed status regarding all the posts pertaining to Ministry/Department of Earth Sciences have been updated on AVMS as on last day of the month of January, 2018. A summary of the status is given below :

- Total number of posts required to be entered on AVMS : 6
- Number of posts filled as on date : 5
- Number of posts totally vacant as on date : 1
- Number of posts under additional charge arrangement : 1
- Number of posts that would fall vacant during the next 06 months : 1

(Vipin Chandra)

Joint Secretary