

**Ministry of Earth Sciences (MoES)**  
**Summary of Important Developments –February,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.	<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 &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>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.</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
53	35

**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:**

1. Seasonal Temperature Outlook for March-May 2018 was issued on 28th February, 2018 by India Meteorological Department(IMD). As per the Outlook, Pre-monsoon Season (March to May 2018), is likely to be warmer than normal temperatures in all meteorological sub-divisions of the country. Seasonal (March-May) average temperatures over many of the subdivisions from northwest and neighbouring central India are likely to be above normal by more than 1.0 °C. Normal to above normal heat wave (HW) conditions are likely to occur over core heat wave zone of the country.
2. Seventy One (71) new stations were added on All India Nowcast Warning Page of IMD website for issuing three hourly thunderstorm nowcast. With this, the total number of stations have risen to 378.
3. IMD extended meteorological support to new Pakyong Greenfield Airport, Pakyong, East Sikkim with effect from 24<sup>th</sup> February, 2018.

**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 22.7 Million farmers in the country are 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	339
Automatic Rain Gauge (ARG)	1350	557
GPS Sonde based RS/RW Stations	43	30

Doppler Weather Radar (DWR)	25	24
Surface Ozone over Delhi ( <a href="#">Electrochemical Concentration Cell</a> )	07	07
Nephelometer	12	12
Sky Radiometer	19	16
Black Carbon Monitoring Systems (Aethalometer)	16	15
Hydromet. (IMD & Extra-departmental excluding AWS & ARG)	---	2404@
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**

#### **Significant weather events:**

#### **Western Disturbances and associated weather:**

Eight (8) Western Disturbances (WDs) affected western Himalayan region and adjoining plains of northwest India during the month, against the normal frequency of 4-5 WDs.

**Dense to very dense fog** was observed at a few places over Haryana, Chandigarh & Delhi and Uttar Pradesh on one or two days and at isolated places over Uttarakhand, north Rajasthan, Madhya Pradesh, Odisha, Bihar, Sub-Himalayan West Bengal, Assam & Meghalaya and Tripura on one or two days during the month of February 2018.

**Cold wave conditions** prevailed at isolated places over Punjab, Haryana and north Rajasthan on one or two days of the month. The lowest minimum temperature of 2.4°C was recorded at Churu (Rajasthan) in the plains of the country on 7<sup>th</sup> February. The lowest maximum temperature of 15.6° C was recorded at Hardoi (Uttar Pradesh) in the plains of the country on 12<sup>th</sup> February 2018.

The number as well as duration of fog and cold-wave conditions had been less in this month as compared to previous years due to successive passage of WDs across western Himalayan region.

#### **Rainfall in February, 2018**

Rainfall during the month of February, 2018 was large excess in 2, excess in 4, normal in 4, deficient in 9, large deficient in 16 and no rain in 1 of 36 meteorological sub- divisions. The rainfall for the country as a whole for the month has been recorded as 12.6 mm (-43%) against the Long Period Average of 22.2 mm.

Number of Heavy rainfall events (>64.4mm in 24 hrs ending at 0830 hrs IST of date) and Skill (% correct) of spatial distribution of warnings during February 2018 is as follows:

<b>Lead Time</b>	<b>No. of heavy Rainfall Events :5</b>
24 Hour	99%
48 Hour	99%
72 Hour	99%

Thundersquall & Hailstorm activity during the month (till 0830 IST of 28-02-2018) is given in the table below:

S. No.	Region	TS Days	Date of Maximum TS Activity	Hail Events	Squall Events
1.	South Peninsular India	6	07/08/09-02-2018	Nil	Nil
2.	Northwest India	9	12-02-2018	05	Nil
3.	Northeast India	6	26-02-2018	01	Nil
4.	East India	6	26-02-2018	04	Nil
5.	Central India	6	11-02-2018	01	Nil
6.	West India	--	--	--	--

Daily All India Weather Summary and Weekly Weather Reports and are being brought out on routine basis.

All India Weather Bulletins, All India inference and severe weather warnings (112 each); Press Releases (04); Current weather outlook and forecast for next two weeks (04) were issued during the month. Fifty Eight (58 Nos.) mountain weather bulletins including severe weather warnings for western and central Himalayan region were issued during February, 2018.

Nowcast Guidance Bulletins for severe weather (heavy rainfall, thunderstorms, Fog etc) were issued twice a day on daily basis and a total of Fifty Six (56) Bulletins were issued during the month.

### **Geoscience Research**

#### **Seismological Observational Network**

Observation Type	Target for XII Plan	Commissioned so far	Data reporting during the month
Seismic stations	130	102	56
GPS stations	40	28	21

#### **Earthquake and Tsunami monitoring**

Earthquake: 10 earthquakes were monitored in the Indian region out of which one event was greater than magnitude (M) of 5.0.

Tsunami: 2 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 February, 2018	Data received during February, 2018
Argo Floats *	200	316	147
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	9

\*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
2	Ocean State Forecast(OSF)-Wave, Wind, Currents, SST, MLD and D20 forecasts	28
3.	Near Real time global ocean analysis (5-day averaged)	6
4.	Real time global ocean analysis (daily)	28
5.	Coral Bleaching Alert System	10

A scientific cruise was completed onboard ORV Sagar Manjusha in the coastal Bay of Bengal during 20 January to 04 February 2018. The cruise is a precursor cruise for the proposed MOSAIC project to survey the biogeochemical parameters in the coastal waters of Bay of Bengal.

A scientific cruise was completed in the Arabian Sea onboard Sagar Nidhi during 12 January to 12 February, 2018. Different instruments such as uCTD, VMP, ASIMET and ADCP were operated during this cruise. One Lagrangian float was operated for two weeks during this cruise. The main objective of the cruise was to collect time series measurements to document the diurnal variability of vertical distribution of turbulence and also to document mixed layer heat and salt budget and the modulation of chlorophyll variability in the winter in response to physical and dynamical factors.

### **Polar Science and Cryosphere**

Antarctic Expedition Vessel-M.V. Ivan Papanin, after completing cargo operations at Bharati station in Larsemann Hills met with an accident. Crew and voyage team members are safe and there is no oil spillage. Initial investigation suggests heavy water ingress through ballast tanks. Efforts are being made to supply food and fuel/oil to Maitri station by hiring another ship.

In a Himalayan Cryospheric study, total of 29 glaciers covering an area of ~ 227 square km were studied. The glacier retreat for the period 1989–2014 was estimated using the satellite data of Landsat. Observations revealed almost  $9 \pm 0.7$  square km recessions in glacier area (4%) for studied glaciers of Miyar basin during 1989–2014. Within the Miyar basin glaciers with large size, having a steep slope with high debris cover and northward aspect showed low retreat than glaciers of small size, gentle slope and low debris cover with southward aspect.

### **Ocean Resources**

An exploration cruise was undertaken for hydrothermal sulfides near Rodrigues Triple Junction in South West Indian Ocean.

### **Capacity Building and Outreach:**

A short film on SAFAR- Ahmedabad entitled, “SAFAR -An Environmental Warrior” received the “Certificate of Merit” by Vigyan Prasar, DST, Govt. of India, awarded during 8th National Science Film Festival(NSFF) -2018, held at University of Gauhati, Guwahati (Assam) during 20-24 February, 2018. The film was shortlisted by Vigyan Prasar for screening and nominated under category “A” (films by Govt. and non-Govt. Institutions) during 8th NSFF 2018. The SAFAR documentary is made available at Youtube: <https://www.youtube.com/watch?v=ROhfV8Cbmr8&feature=youtu.be>

A Refresher course on Interpretation of Numerical Weather Prediction (NWP) products for weather forecasting services was conducted during 12 -16 February, 2018 at Meteorological Training Institute (MTI), IMD Pune.

For the scientists working at Radar Stations of IMD at all over India, a five-day workshop on Doppler Weather Radar (DWR) familiarization, handling of test equipments, power- measurements, calibration, radar hardware etc., was conducted during 19 – 23 February, 2018 at Chennai.

Indian Meteorological Society, Chennai Chapter and Regional Meteorological Centre, Chennai jointly organized a seminar on “Monsoons 2017” on 28<sup>th</sup> February, 2018 at Chennai.

For the scientists of North East Space Application Centre (NESAC) and RMC Guwahati , one-day Training workshop on Doppler Weather Radar (DWR) Products was held on 12<sup>th</sup> February,2018 at Guwahati.

**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	25	3	2	-
Sagar Manjusha	24	4	4	-
Sagar Purvi	16	12	2	-
Sagar Kanya	19	9	2	-
Sagar Sampada	27	1	1	-

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

Subject	Publications			Ph.Ds		
	April – January 2017	February, 2018	Total	April – January, 2017	February, 2018	Total
Atmospheric Sciences	128	15	143	8	-	8
Ocean Science and Technology	43	4	47	2	-	2
Polar Sciences	13	2	15	1	-	1
Geosciences and resources	13	-	13	1	-	1
Total	197	21	218	12	-	12

Ministry of Earth Sciences

CERTIFICATE

(For the month of February, 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 February, 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 :6
- Number of posts totally vacant as on date : 0
- Number of posts under additional charge arrangement : 0
- Number of posts that would fall vacant during the next 06 months : 1

(Vipin Chandra)

Joint Secretary