

**Ministry of Earth Sciences (MoES)**  
**Summary of Important Developments –November,2017**

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 MoESwill 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
49	38

**8. Information on the specific steps taken by the Ministry/Department for utilization of the 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:**

- A Multi-State Mega Mock Exercise of Tsunami for East Coast of India was conducted on November 24, 2017 in collaboration with National Disaster Management Authority (NDMA) and Ministry of Home Affairs (MHA), Government of India. Coastal States of Andhra Pradesh (9 Districts), Tamil Nadu (13 Districts), Puducherry (1 District), Odisha (6 Districts) and West Bengal (3 Districts) participated in the mock exercise. More than ten thousand people were evacuated during the mock drill.
- Two Indian Patents were awarded to National Institute of Ocean Technology(NIOT) for (i)an indigenously developed acoustic transducer and (ii) an apparatus for the continuous generation of potable drinking water.
- The Ocean Thermal Energy Conversion assisted desalination test facility was set up where experiments for optimisation of thermal cycles for powered desalination will be conducted.

#### **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	332
Automatic Rain Gauge (ARG)	1350	615

GPS Sonde based RS/RW Stations	43	30
Doppler Weather Radar (DWR)	22	20
Surface Ozone over Delhi ( <a href="#">Electrochemical Concentration Cell</a> )	07	07
Nephelometer	12	12
Sky Radiometer	12	08
Black Carbon Monitoring Systems (Aethalometer)	16	15
Hydromet. (IMD & Extra-departmental excluding AWS & ARG)	---	2357@
Aviation	74	74

@ 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 November, 2017**

Rainfall during the month of November, 2017 was large excess in 0, excess in 0, normal in 6, deficient in 3, large deficient in 24 and no rain in 3 of 36 meteorological sub-divisions. The rainfall for the country as a whole for the month has been recorded as 14.5 mm (-50%) against the average of 29.7 mm.

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

Depression over west-central Bay of Bengal (15-17 November 2017): A low pressure area (LPA) formed over southwest Bay of Bengal (BoB) and neighborhood in the morning of 10<sup>th</sup> November, 2017. It lay as a well marked low pressure area (WML) over southwest BoB and neighborhood in the morning of 13<sup>th</sup>. It further concentrated into a depression over westcentralBoB off Andhra Pradesh. Moving nearly north-northeastwards, it weakened into a WML over northwest Bay of Bengal off Odisha Coast. The system caused heavy to very heavy rainfall at isolated places over Odisha and coastal Andhra Pradesh on 15<sup>th</sup> and heavy rainfall at isolated places on 17<sup>th</sup>.

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IMD mobilised all its resources to track the system and regular warnings w.r.t. track, intensity, landfall and associated adverse weather were issued to concerned central and state disaster management agencies, fishermen, ports, ships, print & electronic media and general public.

Under the MoES (INDIA)-NERC (UK) research program "Atmospheric Pollution and Human Health in Indian Megacities (APHH)", APHH Secretariat has been established at Indian Institute of Tropical Meteorology(IITM), Pune on 20 October 2017. Under this program, campaign will be conducted in Delhi during November 2017 to February 2018 to assess air quality and weather conditions in Delhi during winter months.

ENSO bulletin and Seasonal Climate Outlook for South Asia for the month of November 2017 was issued. ([www.imdpune.gov.in/Clim\\_Pred\\_LRF\\_New/Products.html](http://www.imdpune.gov.in/Clim_Pred_LRF_New/Products.html)).

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

The temperature outlook for 2017-18 Winter Season (DJF) for India was prepared.

Climate forecast outlook for temperature and rainfall over South Asia for the 2017-18 winter season (DJF) was issued.

Climate Diagnostics Bulletin of India for October 2017 was brought out.

ENSO bulletin for the month of November 2017 and Seasonal Climate Outlook for South Asia for October 2017 to January 2018 were issued.

Patna Air Quality Assessment Campaign has been organized at Patna (Bihar) in collaboration with Government of Bihar during Oct-Nov 2017. During the campaign air quality and weather parameters has been monitored at 10 different locations in the city representing various microenvironments

## **Geoscience Research**

### **Seismological Observational Network**

Observation Type	Target for XII Plan	Commissioned so far	Data reporting during the month
Seismic stations	130	102	49
GPS stations	40	28	21

### **Earthquake and Tsunami monitoring**

**Earthquake:** 15 earthquakes were monitored in the Indian region out of which 3 events were greater than magnitude (M) of 5.0.

**Tsunami:** 8 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 November, 2017	Data received during November, 2017
Argo Floats *	200	304	143
Drifters*	150	103	2
Moored Buoys	16	19	19
Tide Gauges	36	34	26
High Frequency(HF) Radars	10	10	9
Current Meter Array	10	11	2
Acoustic Doppler Current Profiler(ADCP)	20	20	15
Tsunami Buoys	7	9	9
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.

Indian scientists successfully completed a RAMA cruise to deploy two T-Flex mooring and eight Argos floats and retrieval of a glider jointly with National Oceanic and Atmospheric Administration(NOAA).

### **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)	30
2	Tuna Fishing Advisories	25
2	Ocean State Forecast(OSF)-Wave, Wind, Currents, SST, MLD and D20 forecasts	30

3.	Near Real time global ocean analysis (5-day averaged)	6
4.	Real time global ocean analysis (daily)	24
5.	Coral Bleaching Alert System	10

### **Ocean Technology**

An indigenized calibrator for precipitation sensor is successfully developed in-house by National Institute of Ocean Technology(NIOT) with calibrator with a chilled mirror and Platinum Resistance Thermometer(PRT) for air humidity and air temperature sensors. Using these calibrators, many sensors were calibrated till date and deployed in Ocean and the performance is satisfactory.

Deep Sea Autonomous Underwater Profiling Drifter (AUPD) test trial was conducted at Idukki lake at a depth of 110m with 5 profiles and its performance has been found to be satisfactory.

### **Topographic surveys of Exclusive Economic Zone:**

Area covered during the month: 32,550 sq. km(approx.)

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

Training workshop on “Quantitative reconstruction and numerical methods for analysis of past climate variability using diatoms” was organized by National Centre for Antarctic and Ocean Research(NCAOR), Goa and Norwegian Polar Institute (NPI), Norway under the Indo-Norwegian Project from 21<sup>st</sup> Nov to 24<sup>th</sup> Nov 2017. The training comprised of lectures by scientists from NPI, Norway on quantitative numerical techniques using diatoms for past reconstruction along with practical training for identification of diatoms and for using latest software for past reconstruction. The training was attended by students from Anna University, Chennai; Birbal Sahani Institute of Paleobotany, Lucknow, Physical Research laboratory, Ahmadabad and NCAOR, Goa.

IMD hosted an International seminar on ‘World Meteorological Organisation / United Kingdom Met. Office (WMO/UKMO) Aviation Seminar’ under voluntary Co-operation Programme (VCP) of WMO in New Delhi during November 13-17, 2017. Nineteen trainees from 14 countries participated in the seminar.

NIOT hosted the 33<sup>rd</sup> Executive committee meeting of the International Energy Agency’s Technology Collaboration Programme on Ocean Energy Systems (IEA – OES) in Chennai, India for the first time during November 14-15, 2017. Nearly 15 delegates from other countries participated in this meeting.

Ministry of Earth Sciences participated in the 37<sup>th</sup> India International Trade Fair at Pragati Maidan, New Delhi and was adjudged for Excellence in Display with Special appreciation Certificate.

An international seminar on Aviation Hazards and SIGMET was conducted at INCOIS during 13-17 November, 2017. India Meteorological Department( IMD) conducted one day workshop on Legal and Vigilance held at New Delhi on 22.11.2017.

A Rooftop Solar PV systems was installed at Office & Residential Complex of National Centre for Medium Range Weather Forecasting.

Fifty five members from Disaster Management Offices (DMOs) of Andhra Pradesh, Odisha, Tamil Nadu and West Bengal; National Disaster Management Authority(NDMA), National Disaster Response Force(NDRF), Indian Navy, Coast Guard participated in the national-level one day Tsunami Standard Operating Procedure (SOP) workshop on 8 November, 2017.

A one day workshop titled “Harnessing Energy from the Oceans – A global Scenario” was held at NIOT on 13<sup>th</sup> November 2017. Both Indian researchers and experts from around the globe delivered talk and provided insight on developments in ocean energy.

A two day Open house programme was organised on 5-6 November 2017 as part of World Tsunami Awareness Day at INCOIS. 317 students and faculty from 3 schools and two colleges, participated in the open house programme and gathered detailed information about Tsunamis and Indian Tsunami Early Warning System.

Over 180 school student winners (from 31 districts) of various state-wide competitions conducted by Telangana Social Welfare Residential Educational Institutions Society, visited INCOIS on 17 November 2017 as part of their exposure tour to National Science Centres .

#### **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	28	2	1	-
Sagar Manjusha	16	14	2	-
Sagar Purvi	14	16	2	-
Sagar Kanya	24	6	2	-
Sagar Sampada	24	6	2	-

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

Subject	Publications			Ph.Ds		
	April – October, 2017	November, 2017	Total	April – October, 2017	November, 2017	Total
Atmospheric Sciences	82	11	93	4	2	6
Ocean Science and Technology	27	7	34	1	-	1
Polar Sciences	12	1	13	1	-	1
Geosciences and resources	12	1	13	--	1	1
Total	133	20	153	6	3	9

**Ministry of Earth Sciences**

**CERTIFICATE**

**(For the month of November, 2017)**

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 November, 2017. 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