

Ministry of Earth Sciences(MoES)
Summary of Important Developments –October, 2015

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 Cabinet/ Cabinet Committees:**

S.No.	Number of Cabinet/ Cabinet Committee decisions pending for compliance	Proposed action plan/timelines	Remarks
1.	Dt. 8/5/2009 India's submission for an Extended continental Shelf prepared by Ministry of External Affairs(MEA)	First partial submission based on Article 76 of the UNCLOS, was submitted in UN on 11 May, 2009. Second partial submission requires new geophysical survey. The data processing, analysis, Interpretation and report preparation will be completed by December 2016. The claim would be submitted by April, 2017.	The 1 st phase of geophysical survey has been completed.
2.	Dt. 27/8/2009, Continuation of programme Polar Science:-Expedition to Antarctica	Planned yearly summer (Nov.-April) and winter expeditions(Nov-Nov) to Indian Station Maitree and Bharti to be continued during the XII Five year Plan period. Winter team would continue to stay at the stations till next summer.	--
3.	Dt 19/5/2010 Acquisition of Ice-class Research Vessel	Note for Cabinet approved. The selected shipyard has sought change in certain terms and conditions of tender and price increase at the time of signing the agreement. Negotiations are continuing with shipyard.	--
4.	Dt. 26/4/2012 Monsoon Mission	Under implementation till April, 2017. Studies on the existing model and incorporation of changes in the model to improve skill by 2015. Setting up an Indian model buy 2017 followed by investigations.	--
5.	Dt.28/11/2013 Scientific Deep Drilling in Koyna	Under implementation till 2018. This includes preparatory phase for scientific deep drilling in 2014, setting up of research lab by 2016, setting up of borehole observatory, scientific deep drilling and coring, geological logging by 2018 followed by scientific investigations	--
6.	Dt.28/11/2013 International Ocean Discovery Programme- MoU between National Science Foundation and Ministry of Earth Sciences	Under implementation till 2019. This includes signing of MoU in Aug. 2014, Scientific Drilling for Indian Proposal in Arabian sea in 2015 followed by investigations.	--

4. 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>	--

5. Cases of sanction for prosecution pending in the Ministry for more than three months: Nil

6. Particulars of cases in which there has been a departure from the Transaction of Business rules of established policy of the Government: Nil

7. Status of implementation of e-Governance : Under process

8. Status of Public grievances:

No. Of Public Grievances redressed during the month	No. Of Public Grievances pending at the end of the month
35	30

Important policy decision taken and major achievements

Indian National Centre for Ocean Information Services(INCOIS), an autonomous institute under Ministry of Earth Sciences in collaboration with Ministry of Home Affairs (MHA) has conducted a Tsunami Mock Drill on September 26, 2015 for the eastern coastal states (Andhra Pradesh, Odisha, Puducherry, Tamil Nadu and West Bengal) to improve awareness and preparedness of administrators and the general public. As part of the drill, the warning system was tested using a scenario of magnitude 9.0 earthquake in the Andaman Islands region during 9:30 hrs - 13:30 hrs IST disseminating 7 bulletins through Email, Fax and SMS. All the states/UTs who has participated in the drill has taken it down to the public level and evacuated at 11 villages in Andhra Pradesh, 6 districts in Odisha, 4 villages in Tamil Nadu and 6 villages in West Bengal.

Tidal flooding/wave surge alerts associated with the perigeon spring tide and the high swells was issued during 26 September 2015 - 4 October 2015. This forewarning helped many coastal communities along the coasts of Kerala, Tamil Nadu, Andhra Pradesh and West Bengal.

Minimum Government, Maximum Governance

Agromet Advisories were communicated to 115 lakhs farmers of the country through mobile SMS and IVR (Interactive Voice Response) Technology.

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

Atmospheric Observation Systems Network

Observation Type	Target	Commissioned up to October, 2015	Existing	Total	Data reporting
Automatic Weather Station (AWS)	550	555	125	680	416
Automatic Rain Gauge(ARG)	1350	1291	--	1291	526
GPS Sonde	10	36	1	37	37
Doppler Weather Radar(DWR)	23	17	5	22	14
Ozone	17	15	--	15	15
Other Rain Gauges excluding ARG and AWS	-	-	--	-	2235@
Aviation	--	72	--	72	72
Agro-meteorology	267	264	--	264	160

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

Atmospheric Processes, Modeling and Services**Rainfall in October, 2015**

Rainfall was excess in 1, normal in 6 and deficient/scanty in 30 of 36 meteorological sub- divisions. The actual rainfall for the month was 42.8 mm against the normal rainfall of 80.9 mm.

Significant Weather event

A depression formed over the Arabian Sea on 9th October morning from a low level circulation embedded in the eastwest shear zone passing through eastcentral Arabian Sea. It moved north-northwestwards and intensified into a deep depression on 10th morning. It further moved north-northwestward direction and maintained its intensity till 11th morning. Later on it weakened gradually and dissipated over the sea itself.

Southwest monsoon withdrew from entire country on 19th October 2015

Northeast monsoon rains commenced over Tamil Nadu & adjoining south Peninsular India on 28th October 2015.

Modelling

The latest high resolution (T382 spectral resolution) research version of the coupled model (CFS Version 2) has been used to generate the experimental forecast for the 2015 NE Monsoon season rainfall (over Indian region) using the September initial conditions with 48 ensembles (by Seasonal Prediction group). The prediction indicated above normal rainfall and above normal temperatures over India for NDJ, and DJF months. Predictions are made available at <http://www.tropmet.res.in/monsoon/seasonal/>

The experimental real-time extended range prediction based on 23rd October 2015 initial condition was generated and is made available at <http://www.tropmet.res.in/erpas/>. MJO forecast, This Multi model Ensembles (MME) forecast has been prepared using CFS (T126 and T382) and GFS (T126 and T382). Each resolution of CFS and GFS is having 11 ensemble members. Minimum, maximum temperature forecasts and pentad wise temperature anomalies are also available in the same link.

Monsoon Weather Reports, Maps and Crop Yield Forecast

Daily All India Weather Summary and Weekly Weather Reports have been brought out.

Crop yield forecast at planting stage (F1) for *Kharif*2015 for 8 states (Gujarat, Haryana, Karnataka, Maharashtra, Madhya Pradesh, Punjab, Rajasthan and Telangana) were issued on 30th October 2015.

Four weekly and cumulative Standardized Precipitation Index (SPI) maps were prepared for the weeks ending 7. 14. 21. 28 October.

Three Drought Outlook Maps for the weeks of 1-7 Oct ,8-14 Oct. and 15-21 Oct. for SW Monsoon Season and for the week 22-28 Oct. for NE Monsoon for 5 sub-divisions were prepared and uploaded on IMD Pune website.

Three weekly Aridity anomaly reports and maps for the period Oct. 1-7, 8-14, 15-21 and for the week 22-28 Oct for NE Monsoon for 5 sub-divisions were uploaded on IMD Pune website. Two Biweekly Aridity anomaly maps and reports for the period 24 Sept. – 7 Oct. and 8-21 Oct during SW monsoon season and also issued to M/o Agriculture.

Four weekly aridity anomaly reports for the period Oct. 1-7, 8-14, 15-21, 22-28 Oct.were prepared and sent for input in Agro Advisory Services.

Geoscience Research

Seismological Observational Network

Observation Type	Target for XII Plan	Commissioned so far	Data reporting during the month
Seismic stations	130	85	47
GPS stations	40	27	19

Earthquake and Tsunami monitoring

Earthquake: 11 earthquakes were monitored in the Indian region out of which 6 events were greater than magnitude (M) of 5.0.

An earthquake of magnitude 7.5 occurred on 26 October 2015 at 14:40 hrs. IST in Afghanistan about 260 km north-northeast of Kabul. The event, which comes under the category of “**Major earthquake**”, felt severely in all cities of northern states of India, including Delhi and NCR. The fault plane solution determined by NCS suggests that the earthquake occurred on a north-south oriented, south dipping and steep plane with predominantly reverse motion on it. This earthquake is the largest earthquake in past fifty years from the Hindukush region.

Tsunami: 2 major seabed earthquakes (M> 6) with a potential to generate tsunami were monitored. This information was provided within 12 minutes of occurrence of the earthquake for one event and between 12-15 minutes for another event.

Ocean Observation System

Type of Platform	Target	Commissioned till October, 2015	Data received during October, 2015
Argo Float	200	266	126*
Drifters	150	144	7*
Moored Buoys	16	28	17
Tide Gauges	36	25	19
High Frequency(HF) Radars	10	10	10
Current Meter Array	10	11	5
Acoustic Doppler Current Profiler(ADCP)	20	21	16
Tsunami Buoys	7	7	6
Wave Rider Buoy	16	11	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)	30
2.	Ocean State Forecast(OSF)-Wave, Wind, Currents, SST, MLD and D20 forecasts	30
4.	Near Real time global ocean analysis (5-day averaged)	6
5.	Real time global ocean analysis (daily)	24
6.	Coral Bleaching Alert System	10

Polar Science and Cryosphere

Setting up of a camp in Himalaya: – The highly challenging activities to the logistics through the transportation of field station components have been completed and the basic outer structure of the Field Station was completed.

Fourth summer batch of Indian Arctic expedition left for Ny-Ålesund, Arctic on 2 Oct 2015. Projects pertaining to the study of atmospheric science and long term monitoring of Kongsfjorden (hydrography, biology and microbiology) have been successfully implemented during fourth summer batch of Indian Arctic expedition.

Ocean Technology

As a part of experimentation on post-installation of the Low temperature thermal desalination technology at North Chennai Thermal power plant, after continuous experimentation and data collection, presently, the plant is able to generate fresh water of 2 ppm quality.

Capacity Building and Outreach

Forecast Demonstration Project (FDP) on land falling cyclones over Bay of Bengal and Arabian Sea is being conducted from 15 October to 30 November with collaboration with sister scientific organisation of Ministry of Earth Sciences like NCMRWF and INCOIS; academic institutions like IIT Delhi and IIT Bhubaneswar; and other organisations of Govt. of India such as Indian Air Force, Indian Navy and ISRO.

Inception Winter South Asian Seasonal Climate Outlook Forum (WinSASCOF-1) meeting and 1st Climate Services Users Forum for Agriculture (CSUF-Ag1) were organised by IMD, IITM, WMO and RIMES, Bangkok from 14th to

16th Oct.2015 at Chennai. Delegates from all the countries of SASCOF region, WMO, RIMES, Global Climate Production Centres of WMO and national institutes participated in the events.

Vigilance Awareness week was celebrated from 26-30 October,2015 and debate competitions were organised in the Ministry. The best slogans were displayed over the digital display screens in the Ministry.

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	27	4	3	0
Sagar Manjusha	23	8	4	0
Sagar Purvi	19	12	1	0
Sagar Kanya	23	8	1	0
Sagar Sampada	21	10	1	0

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

Subject	Publications			Ph.Ds		
	April– Septembert 2015	October, 2015	Total	April– September 2015	October, 2015	Total
Atmospheric Sciences	78	17	95	5	-	5
Ocean Science and Technology	31	3	34	4	1	4
Polar Sciences	10	1	11	11	-	-
Geosciences and resources	5	1	6	-	-	-
	124	22	146	9	-	9