

Ministry of Earth Sciences (MoES)
Summary of Important Developments –September, 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 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>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
57	40

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:

Rainfall during Monsoon Season from 1st June to 30th September 2017: The rainfall for the country as a whole from June 1 to September 30, 2017 was recorded as 841.3 mm which is 95% of its Long Period Average (LPA) of 887.5 mm.

A Memorandum of Understanding (MOU) between National Centre for Medium Range Weather Forecasting (NCMRWF) and Andhra University, Visakhapatnam was signed and formalized for mutual cooperation in academics as well as in R&D fields.

A MoU was signed between India Meteorological Department (IMD) and European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT) for establishing EUMETCAST Terrestrial Broadcasting reception station at NCMRWF.

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. Farmers database of Twenty (20) Lakh farmers have been collected from the state of Maharashtra for dissemination of Agromet Advisory.

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	348
Automatic Rain Gauge (ARG)	1350	617
GPS Sonde based RS/RW Stations	43	33
Doppler Weather Radar (DWR)	22	20
Ozone	15	05
Surface Ozone over Delhi (Electrochemical Concentration Cell)	07	07
Nephelometer	12	12
Sky Radiometer	12	08
Black Carbon Monitoring Systems (Aethalometer)	16	15
Hydromet. (IMD & Extra-departmental excluding AWS & ARG)	---	2335@
Aviation	73	73

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

Current Weather Instrument System (CWIS) system was made operational on 1st Oct. 2017 at Shirdi Airport during the inauguration of the airport by President of India.

Atmospheric Processes, Modeling and Services

Rainfall during Monsoon Season from 1st June to 30th September 2017:

Region	Actual (mm)	Normal (mm)	% Departure from Long Period Average
All India	841.3	887.5	-5%
East & Northeast India	1386.4	1438.3	-4%
Northwest India	552.9	615.0	-10%
Central India	918.8	975.5	-6%
South Peninsula	717.6	716.1	0%

Subdivision-wise and category-wise distribution of rainfall

Category	Period- 01.06.2017 to 30.09.2017
	Number of Sub-divisions
Large Excess (+60% or more)	0
Excess (+20% to +59%)	05
Normal (+19% to -19%)	25
Deficient (-20% to -59%)	06
Large Deficient (-60% to -99%)	0
No Rain	0

Withdrawal of Southwest Monsoon 2017: Southwest Monsoon has withdrawn from some parts of Punjab, Haryana, most parts of west Rajasthan, some parts of Kutch and north Arabian Sea on 27th September. It has further withdrawn from remaining parts of Punjab, Haryana, Chandigarh & Delhi, West Rajasthan, Kutch, entire Jammu & Kashmir and Himachal Pradesh, some parts of Uttarakhand & West Uttar Pradesh, most parts of East Rajasthan, some parts of West Madhya Pradesh, north Gujarat region and Saurashtra and some more parts of north Arabian Sea on 30th September, 2017. The monsoon withdrawal line passed through Uttarkashi, Agra, Shivpur Kalyan, Gandhi Nagar, Dwarka, Lat. 22°N/Long. 65°E and Lat. 22°N/Long. 60°E on 30th September 2017.

Low pressure Areas: A low pressure area formed over northwest Bay of Bengal & neighbourhood on 19th and lay over north Chhattisgarh & neighbourhood on 20th. It lay as a Well Marked Low pressure area over northern parts of central Madhya Pradesh & neighbourhood during 21-22 September and over West Uttar Pradesh & neighbourhood on 23rd. It lay as a Low pressure area over West Uttar Pradesh & adjoining Uttarakhand on 24th September and became less marked on 25th September 2017.

Heavy Rainfall Verification for the month: Total No. of Heavy Rainfall events: 360

Lead time of forecast→	24 hour	48 hour	72 hour
Percentage correct	72	73	70

Western Disturbance: Eight (8) active western disturbances passed across western Himalayan region and adjoining plains of northwest India during 3-8; 7-11; 11-15; 13-19; 19-22; 19-25; 24-28 and 29-30 September 2017. Interaction of these western disturbances with low level monsoon easterlies caused scattered to widespread rainfall activity over western Himalayan region and adjoining plains of northwest India with isolated heavy falls on one or two days. In addition to that, interaction of mid & lower level westerlies with the well-marked low pressure area over central parts of north Madhya Pradesh during 22-24 September, caused fairly widespread to widespread rainfall activity over Uttarakhand, Haryana, Chandigarh & Delhi, Uttar Pradesh and Madhya Pradesh with heavy to very heavy & isolated extremely heavy falls rainfall on 22, 23 & 24 September 2017. These heavy rainfall episode were well predicted about 3 days in advance.

World Meteorological Organisation(WMO) appreciated efforts of India in updating the Tropical Cyclone Operational Plan (TCP-21) and development of Tropical Cyclone Forecasting Competency report for the WMO/ESCAP Panel region (Bay of Bengal, Arabian Sea, Bangladesh, India, Maldives, Myanmar, Pakistan, Oman, Sri Lanka, Thailand, Yemen).

Report on Cyclonic Disturbances over north Indian Ocean during 2016 was published and uploaded on RSMC, New Delhi website at the link:

<http://rsmcnewdelhi.imd.gov.in/images/pdf/publications/annual-rsmc-report/rsmc-2016.pdf>

Annual Cyclone Review Report 2015 based on the final report of 43rd Session of Panel on Tropical cyclones (PTC-43) was prepared and sent to world Meteorological Department for publication. The report has also been uploaded on website at the link:

<http://rsmcnewdelhi.imd.gov.in/images/pdf/publications/annual-cyclone-review/annual-%20review-%202015.pdf>

Implementation Report on Forecast Demonstration Project (FDP) for Improving Track, Intensity and Landfall of Bay of Bengal Tropical Cyclones: 2016 was circulated to all the WMO/ESCAP Panel member countries and uploaded on website at the link:

<http://www.rsmcnewdelhi.imd.gov.in/images/pdf/publications/fdp-report/fdp-implementation-report/FDP-2016.pdf>

The Preliminary reports on the (i) depression over the Bay of Bengal during 18-19 July 2017 and depression over Jharkhand (26-27 July 2017) has been prepared and uploaded in website.

A Report on "Severe Weather Events: Winter and Pre-monsoon season" was published..

Daily All India Weather Summary, Weekly Weather Reports and All India Special Daily Weather Reports for southwest monsoon season are being brought out on routine basis.

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

ENSO bulletin and Seasonal Climate Outlook for South Asia for the month of September 2017 was issued.

www.imdpune.gov.in/Clim_Pred_LRF_New/Products.html

Geoscience Research

Seismological Observational Network

Observation Type	Target for XII Plan	Commissioned so far	Data reporting during the month
Seismic stations	130	99	60
GPS stations	40	28	20

Earthquake and Tsunami monitoring

Earthquake: 28 earthquakes were monitored in the Indian region out of which 4 events were 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 September, 2017	Data received during September, 2017
Argo Floats *	200	296	140
Drifters*	150	103	6
Moored Buoys	16	19	18
Tide Gauges	36	34	27
High Frequency(HF) Radars	10	10	9
Current Meter Array	10	11	2
Acoustic Doppler Current Profiler(ADCP)	20	21	18
Tsunami Buoys	7	9	6
Wave Rider Buoy	16	17	11

*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	Tuna Fishing Advisories	30
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)	30
5.	Coral Bleaching Alert System	10

Polar studies:

Multivariate statistics indicated that regions with elevated temperature and low nutrient concentration show high coccolithophore diversity whereas regions with high nutrient concentrations and low temperature show strongly reduced coccolithophore diversity with abundant monospecific *E. huxleyi* (morphotypes B/C and C) assemblages.

The polar study shows that the observed increase in the Total Organic Carbon (TOC) values since the mid-Holocene is a result of better preservation caused by increased sedimentation rate and enhanced reducing conditions. The present study further show that the Indian Summer Monsoon(ISM) has been declining since mid-Holocene (about 6000 years ago).

Ocean Technology

An open sea trial of India's first wave powered navigational buoy developed indigenously by National Institute of Ocean Technology was successfully carried out off Ennore port.

Topographic surveys of Exclusive Economic Zone:

Area covered during the month: 31,900 sq. km (approx.)

Capacity Building and Outreach:

A workshop on 'Stakeholder Engagement in Hydro Climatic Services' was organized during 14-15 September 2017 at Indian Institute of Tropical Meteorology (IITM) under the India- UK water Centre initiative. The workshop facilitated by scientists from IITM and India UK Water Centre was designed to brainstorm on best practices in the design of climate services in India and how current practice may be improved. During this workshop IITM scientists interacted with experts in weather and climate forecasting, tool development and others with an interest in rural and agricultural livelihoods. The workshop also hosted 3 farmers from villages of Solapur and Chandked in Maharashtra to add value to discussions.

Swachhta Pakhwada was observed and Swachhta Hi Sewa (SHS) pledge was administered amongst officers and staff members. The staff and officers took active part in cleaning the premises

Hindi Pakhawada was observed. Various competitions viz. quiz, noting, drafting, debates etc. were organised and employees participated in large numbers. Hindi Divas was celebrated on 14th September.

The Department-Related Parliamentary Standing Committee on Science & Technology, Environment & Forests visited Indian National Centre for Ocean Information Services (INCOIS) on 29 August 2017 and interacted with senior scientists and Director. Committee expressed its happiness with the services provided by INCOIS to fishermen and other users as well as the coastal population.

A training course on "GIS Applications for Coastal Zone Management" was held during August 28 - September 01, 2017. The course was co-sponsored by the Ocean Teacher Global Academy of International Oceanographic Data and Information Exchange" (IODE) of the "Intergovernmental Oceanographic Commission" (IOC), UNESCO. Eleven (11) participants from 8 countries (Bangladesh, Indonesia, Kenya, Mozambique, Seychelles, Sri Lanka, Thailand, and Vietnam) and 14 from India attended the course.

An “Open House/Day” was organized at NCMRWF on 18thSeptember 2017 to showcase the major and unique achievements and facilities. The event also included technology exhibitions of products and services. Further the event featured popular science lectures and interaction of students with scientists. The event created awareness about upcoming India International Science Festival (IISF-2017) to be held in Chennai during 13-16 October 2017. As a pre-event to the “Open House/Day” at NCMRWF, a press conference was organized on 15thSeptember 2017 to brief the media about the event as well as IISF-2017.

Dr. M. Mohapatra, Scientist G & Head (Services) has been elected as Chairman of the WMO/ESCAP Panel on Tropical Cyclones for the year 2017-18 in the 44th Session of the Panel held at Bahrain during 10-14 September.

Dr.R.Venkatesan, Scientist G, NIOT received the - Lockheed Award for Ocean Science and Engineering – 2017 for the technical accomplishment in the field of marine science, engineering or technology on 21st September 2017 at Oceans 17 Conference, Alaska, and USA.

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	24	6	2	-
Sagar Manjusha	10	20	2	-
Sagar Purvi	5	25	1	-
Sagar Kanya	21	9	1	-
Sagar Sampada	29	2	1	-

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

Subject	Publications			Ph.Ds	
	April – August, 2017	September, 2017	Total	April – August, 2017	September, 2017
Atmospheric Sciences	59	11	70	4	-
Ocean Science and Technology	21	4	25	-	-
Polar Sciences	6	3	9	1	-
Geosciences and resources	11	-	11	--	-
Total	97	18	115	5	-

Ministry of Earth Sciences

CERTIFICATE

(For the month of September, 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 September, 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 : Nil

Note : * A proposal for extension of additional charge arrangements to the post of Director, NIOT, Chennai for another 6 months beyond 31.0.7.2017 has been submitted to DOP&T vide DOD no. MoES/27/04/2014 – Estt dated 25th July, 2017.

(Vipin Chandra)

Joint Secretary