

Ministry of Earth Sciences (MoES)
Summary of Important Developments –August,2019

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>A proposal has been received for krill fishing which is under examination.</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
37	16

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:

- As per the forecast issued by India Meteorological Department on 1st August, 2019, (a) the rainfall during August is likely to be $99 \pm 9\%$ of Long Period Average(LPA) as was predicted in June,(b) the rainfall for the country as a whole during the second half of the season(August-September) is likely to be 100% of LPA with a model error of $\pm 8\%$ and (c) the seasonal (June to September) rainfall over the country as a whole is likely to be normal ($96\% \pm 4\%$ of LPA) as was predicted in June.
- The new Coastal Research Vessel Sagar Tara built in Kolkata was successfully delivered on 16th August, 2019 at M/s TWL Shipyard, Kolkata and a maiden scientific cruise commenced on 30th August. Another new Coastal Research Vessel Sagar Anveshika also built in Kolkata was successfully launched on 31 August 2019. Both the vessels will be utilised for pollution monitoring, coastal surveys, port and harbour works, coastal research etc.

There was no matter pending before the Cabinet requiring decision/approval.

Minimum Government, Maximum Governance:

- Dissemination of Agromet Advisories to user communities through SMS and IVR technology is continued in the country through Kisan Portal and under PPP mode. Presently, 40.1 million farmers in the country are getting advisories through SMS directly.
- Adverse-weather SMS warnings are being sent through mobile to the State Government officials / Disaster-related officials / Central Government organizations/common man.
- 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	Installations during the month	Data Reporting
Automatic Weather Station (AWS)	563	--	192
Automatic Rain Gauge (ARG)	1356	--	388
GPS Sonde based RS/RW Stations	47+3	03(Imphal, Lengpui (Aizwal), Jabalpur)	47
Doppler Weather Radar (DWR)	* 25	--	21
Ozone (Ozone Sonde + Total Ozone)	04	--	04

Surface Ozone (Electrochemical Concentration Cell method)	07	--	07
Nephelometer	12	--	12
Sky Radiometer	20	--	19
Black Carbon Monitoring Systems (Aethalometer)	25	--	23
Air Quality Monitoring System (SAFAR)	10(Delhi) 10(Mumbai) 10(Ahmedabad)	--	10(Delhi) 10(Mumbai) 10(Ahmedabad)
Hydromet. (IMD & Extra-departmental excluding AWS & ARG)	---	--	2920
Aviation	79	--	79

* Includes 2 Doppler Weather Radar of ISRO.

Atmospheric Processes, Modelling and Services

Major Weather Systems during the Month:

Deep Depression over northwest Bay of Bengal off north Odisha-West Bengal coasts during 6-9 August, 2019: A low pressure area formed over north Bay of Bengal (BoB) and adjoining coastal areas of Bangladesh & West Bengal on 5th August, 2019. It concentrated into a Depression over northwest BoB off north Odisha - West Bengal coasts in the morning (0830 hrs IST) of 6th; it moved north-westwards and intensified into a Deep Depression over the same region in the early morning (0530 hours IST) of 7th and crossed north Odisha-West Bengal coasts close to north of Balasore in the same afternoon (1330-1430 hrs IST) of 7th; it weakened into a depression in the early morning (0530 hrs IST) of 8th August and into a well marked low pressure area over southeast Rajasthan & neighbourhood in the evening (1730 hrs IST) of 9th August, 2019 and subsequently further weakened into a low pressure area over northwest Arabian Sea and neighbourhood in the evening (1730 hrs IST) of 12th.

Regular warnings w.r.t. track, intensity, landfall and associated adverse weather were issued to concerned central and state disaster management agencies, print & electronic media and general public. Regular advisories were also issued to WMO/ESCAP Panel member countries including Bangladesh. Its genesis, movement and associated adverse weather was well predicted by IMD.

Rainfall Scenario: The rainfall for the country as a whole for the month of August 2019 has been recorded as 297.8 mm which is 15% above to its Long Period Average (LPA) i.e. 258.2 mm. For the current Monsoon Season i.e. from 01/06/2019 to 31/08/2019 recorded rainfall is 709.1mm which is almost equal to its Long Period Average i.e. 710.4 mm.

Rainfall statistics (% departures of area weighted rainfall from LPA):

Region	Period- 01.08.2019 to 31.08.2019			Period- 01.06.2019 to 31.08.2019		
	Actual	Normal	% Departure from Long Period Average	Actual	Normal	% Departure from Long Period Average
EAST & NORTHEAST INDIA	214.0	346.0	-38%	916.8	1125.1	-19%
NORTHWEST INDIA	200.1	202.7	-1%	465.2	490.2	-5%
CENTRAL INDIA	427.9	307.3	+39%	895.7	799.3	+12%

SOUTH PENINSULAR INDIA	296.1	189.2	+56%	602.8	566.1	+6%
COUNTRY AS A WHOLE	297.8	258.2	+15%	709.1	710.4	0%

No. of Heavy rainfall events and (% correct) of spatial distribution of warnings during August 2019 is given below:

Lead Time	No. of Heavy Rainfall Events (>64.4 mm): 514 Heavy Rainfall (115.6mm>64.4mm): 299 Very Heavy rainfall (>or=115.6mm): 215
	Overall (>64.4mm)
24 Hour	73%
48 Hour	69%
72 Hour	67%

Thundersquall(TS) & Hailstorm activity: Thundersquall & Hailstorm activity during the month is given in the table below:

S.No.	Region	TS Days	Maximum TS Activity	Hail	Squall
1	South Peninsular India	26	21-08-19	Nil	Nil
2	Northwest India	31	06-08-19	Nil	Nil
3	Northeast India	27	14-08-19	Nil	Nil
4	East India	30	12-08-19	Nil	Port Blair- 22 squalls {2 Aug (1), 4 Aug (1), 5 Aug (3), 6 Aug (3), 8 Aug (1), 10 Aug (1), 23 Aug (1), 25 Aug(5), 26 Aug (1), 29 Aug (1), 30 Aug(1), 31 Aug (3)}
5	Central India	29	31-08-19	Nil	Nil
6	West India	2	08-08-19	Nil	Nil

Note: The convective activities mentioned above had been predicted and corresponding warnings were issued about 4-5 days in advance of the occurrence of the event.

Temperature Scenerio: The Mean Temp for the month for the country as a whole was 27.91°C; this was slightly above normal (+0.35°C).

Bulletins / Operational Reports/ Services

Bulletins/Warnings/Press Releases Issued: All India Weather Bulletins(124), All India inference and severe weather warnings(124), Press Releases related to (a)monsoon and intense rainfall activity over northeast India (2),(b) current weather status and outlook for next two weeks(5), Nowcast Guidance Bulletins for severe weather (31), All India Weekly Weather Reports (5), Mountain weather bulletins including severe weather warnings for western and central Himalayan region(62), Weekly and cumulative Standardized Precipitation Index (SPI) maps supplied for Agrometeorology Advisory Services Bulletin (4).

Publications & Operational Reports issued: Daily All India Weather Summary and Weekly Weather Reports, El Nino Southern Oscillation (ENSO) bulletin for the month of August 2019 and Seasonal Climate Outlook for South Asia for the month of August to November 2019 (Quick Link: www.imdpune.gov.in/Clim_Pred_LRF_New/Products.html), Gridded Standardized Precipitation Index (SPI) & Standardized Precipitation Evapotranspiration Index (SPEI) at 0.5 x 0.5 degree resolution at 4 weekly 1,2,3 & 4 monthly time scales computed and maps of same timescales are being uploaded at weekly basis on IMD, Pune website.

Modelling

A 20 year Reforecasts using the T1534L64 (V-14) for the period 1999-2018 has been completed. The Reforecasts will be useful for climatological studies, bias corrected forecast products etc.

A global forecast system model at a horizontal resolution of T1534 (~12.5 km) has been evaluated for the monsoon seasons of 2016 and 2017 over the Indian region. The model shows fidelity in capturing the extremely heavy rainfall categories with shorter lead times. However, further development is needed to enhance the skill of forecast of a higher rain rate with a longer lead time.

Probabilistic forecast for all the river basins of India has been developed by Indian Institute of Tropical Meteorology(IITM).

Geoscience Research

Seismological Observational Network

Observation Type	Target	Commissioned so far	Data reporting during the month
Seismic stations	115	115	108
GPS stations	40	20#	19

#10 VSATS have been dismantled to shift them to new locations.

Earthquake and Tsunami monitoring

Earthquake: 30 earthquakes were monitored in the Indian region out of which 9 events were greater than magnitude (M) of 5.0.

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

Ocean Observation System

Type of Platform	Target	Commissioned till August, 2019	Data received during August, 2019
Argo Floats *	200	367	149
Drifters*	150	108	5
Moored Buoys	16	22	18
Tide Gauges	36	36	28
High Frequency(HF) Radars	10	12	11
Current Meter Array	10	11	2
Acoustic Doppler Current Profiler(ADCP)	20	20	17
Tsunami Buoys	7	9	4
Wave Rider Buoy	16	22	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)	15
2	Tuna Fishing Advisories	12
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	11

Hourly data was provided on astronomical tides for the period 10 July - 10 August, 2019 for six locations along the Konkan Coast for the Kharland Development Circle, Thane, Maharashtra.

Polar Expedition

Over 150 expedition members of the 36th Indian Scientific Expedition to Antarctic (ISEA) (summer), 37th ISEA (summer and winter) and 38th ISEA (summer) were felicitated during the debriefing function held at National Centre for Polar and Ocean Research(NCPOR) on 20th August, 2019.

Ocean Technology

One patent was awarded for Portable In-situ Soil Tester, used for quickly and accurately assessing the load bearing strength of soft soils.

National Institute of Ocean Technology (NIOT) celebrated Silver Jubilee during August 19-20, 2019. A new website of NIOT was launched and a coffee table book on NIOT was released.

Topographic Survey of Exclusive Economic Zone

Area covered during the month: About 19770 sq. km

Capacity Building and Outreach

Under the framework of International Oceanographic Data and Information Exchange, International training course on “Coastal Vulnerability Mapping and analysis using GIS/QGIS technique” was successfully conducted during 26-30 Aug 2019 in International Training Centre for Operational Oceanography at Indian National Centre for Ocean information Services(INCOIS). Thirty seven (37) participants including 14 from 11 countries (Bangladesh - 2, Sri Lanka - 1, Indonesia - 2, Malaysia - 1, Seychelles - 1, Mauritius - 1, Philippines - 2, Japan - 1, Iran - 1, Tanzania -1, Kenya - 1) attended the course. The course had a group presentation by 5 groups based on the hands on provided during the training period. All the participants were given certificates of participation. This is 2nd OTGA funded course conducted this year.

National Conference on Polar Sciences, (NCPS)-2019 : NCPS-2019 was hosted by National Centre for Polar and Ocean Research, in Goa from 20th -22nd August 2019. Young Polar Scientists Meet (YPSM) was also organised. YPSM included poster presentations by the young polar scientists along with the plenary lectures by Dr. John Turner, British Antarctic Survey and Prof. R. Shankar, International Geoscience Education Organisation (IGEO). During NCPS-2019, about 69 oral and 108 posters (including YPSM), 03 plenary talks and 07 keynote talks under 07 themes were presented which covered studies from Polar Regions to the Southern Ocean. The event was attended by more than 250 scientists and researchers across India.

One day workshop on “Towards Exascale Computing with Intel MPI Library 2019” on 22nd August, 2019. 39 participants from IITM and C-DAC Pune attended this workshop.

On 28th Aug 2019, Hindi Workshop was organized at National Centre for Medium Range Weather Forecasting (NCMRWF0, NOIDA. Training lecture was given by Former Hindi Officer, Town Official Language Implementation Committee, Noida.

Utilization of Ocean Research Vessels during the month

Vessel	Days at Sea / Utilization	Maintenance/ Inspection /Scientific Logistics / Cruise Preparation	No. of Cruise
Sagar Nidhi	28	3	1
Sagar Manjusha	17	14	1
Sagar Purvi	8	23(maintenance)	1
Sagar Kanya	20	11	1

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

Subject	Publications			Ph.Ds		
	April- July, 2019	August, 2019	Total	April- July, 2019	August, 2019	Total
Atmospheric Sciences	61	16	77	-	--	-
Ocean Science and Technology	23	19	42	-	-	-
Polar Sciences	8	3	11	-	-	-
Geosciences and resources	6	-	6	2	-	2
Total	98	35	136	2	-	2

No.MoES/20/01/2017-Estt.
Government of India
Ministry of Earth Sciences

Prithvi Bhavan, Lodhi Road
New Delhi-110 003

Dated, the 3rd September, 2019

CERTIFICATE

(FOR THE MONTH OF AUGUST, 2019)

It is certified that the detailed status regarding all the posts pertaining to Ministry of Earth Sciences have been updated on AVMS as on last day of the month of August, 2019. A summary of the status is given below:-

- | | | |
|-----|---|------|
| (a) | The total number of posts required to be entered on AVMS | - 09 |
| (b) | Number of posts filled as on date | - 08 |
| (c) | Number of posts totally vacant as on date | - 01 |
| (d) | Number of posts under additional charge arrangement | - 00 |
| (e) | Number of posts that would fall vacant during the next 6 months | - 00 |



(Dr. Vipin Chandra)
Joint Secretary
js@moes.gov.in