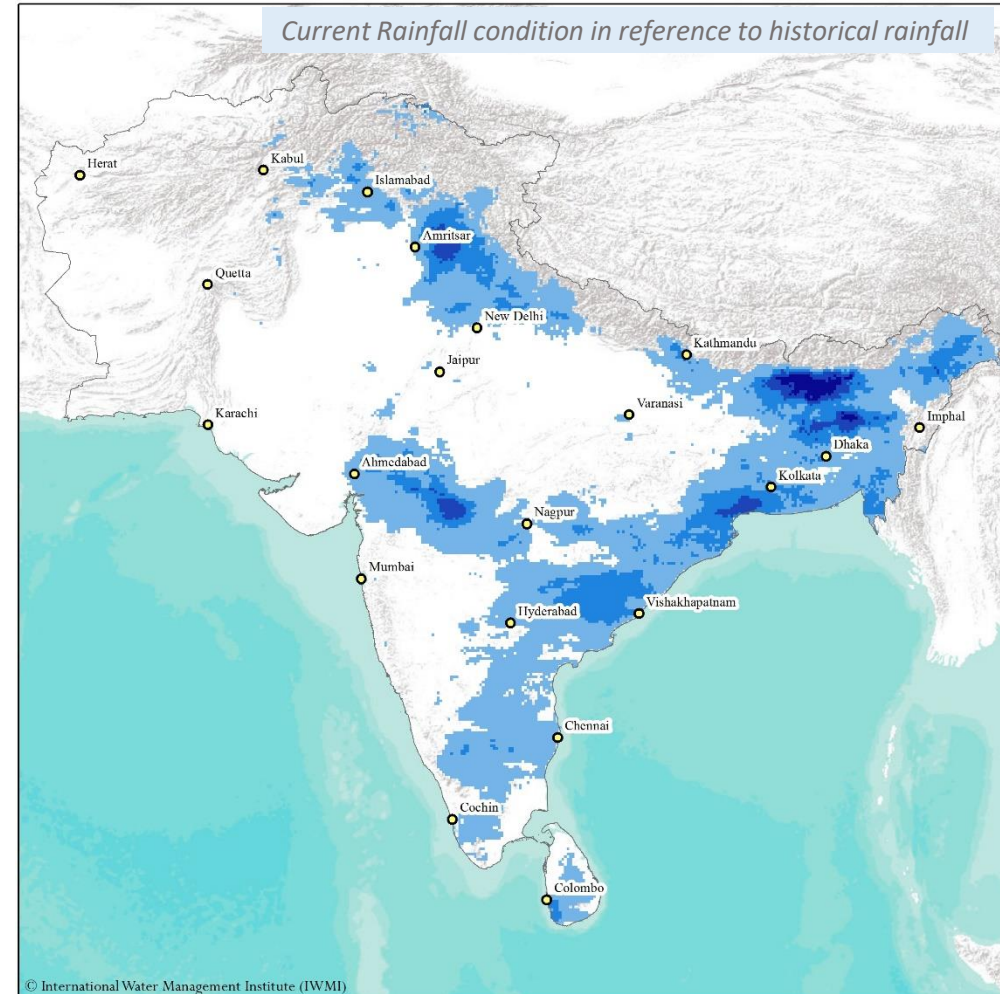
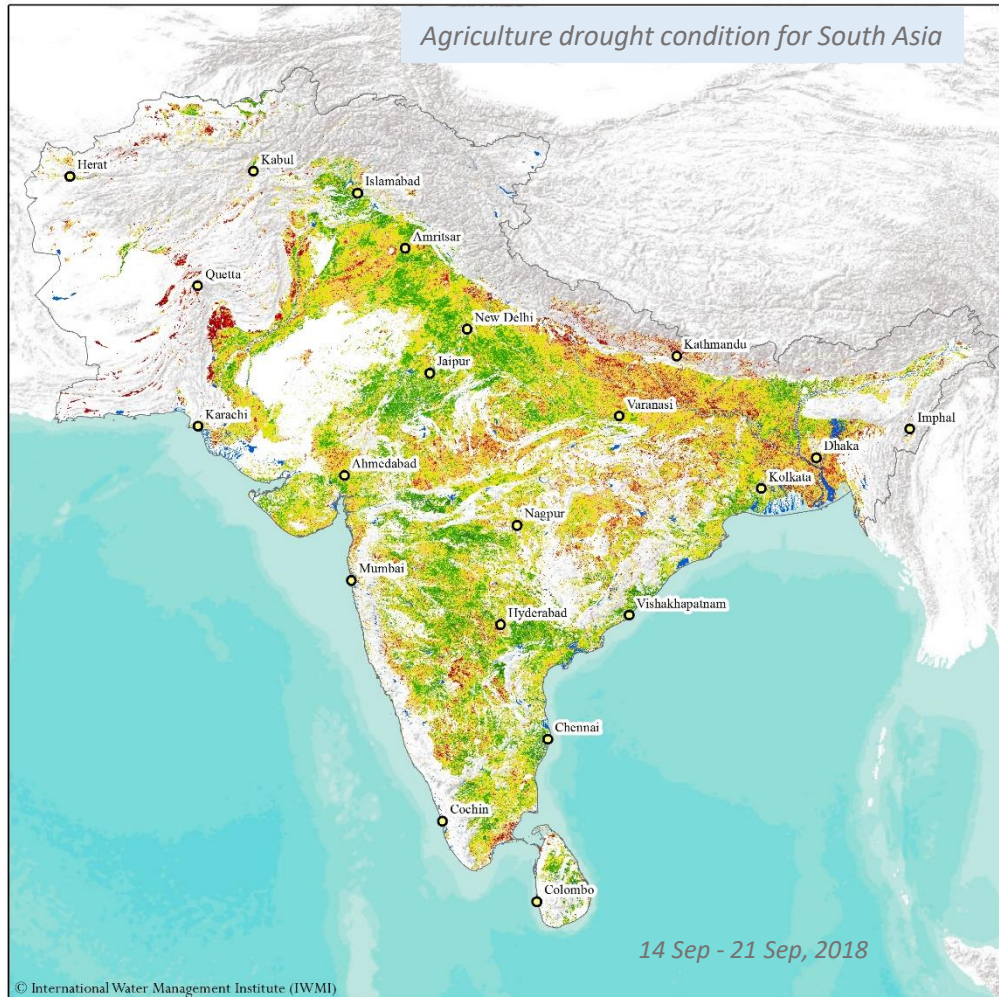


SADMS DROUGHT BULLETIN

28 Sep 2018 | ISSUE 10

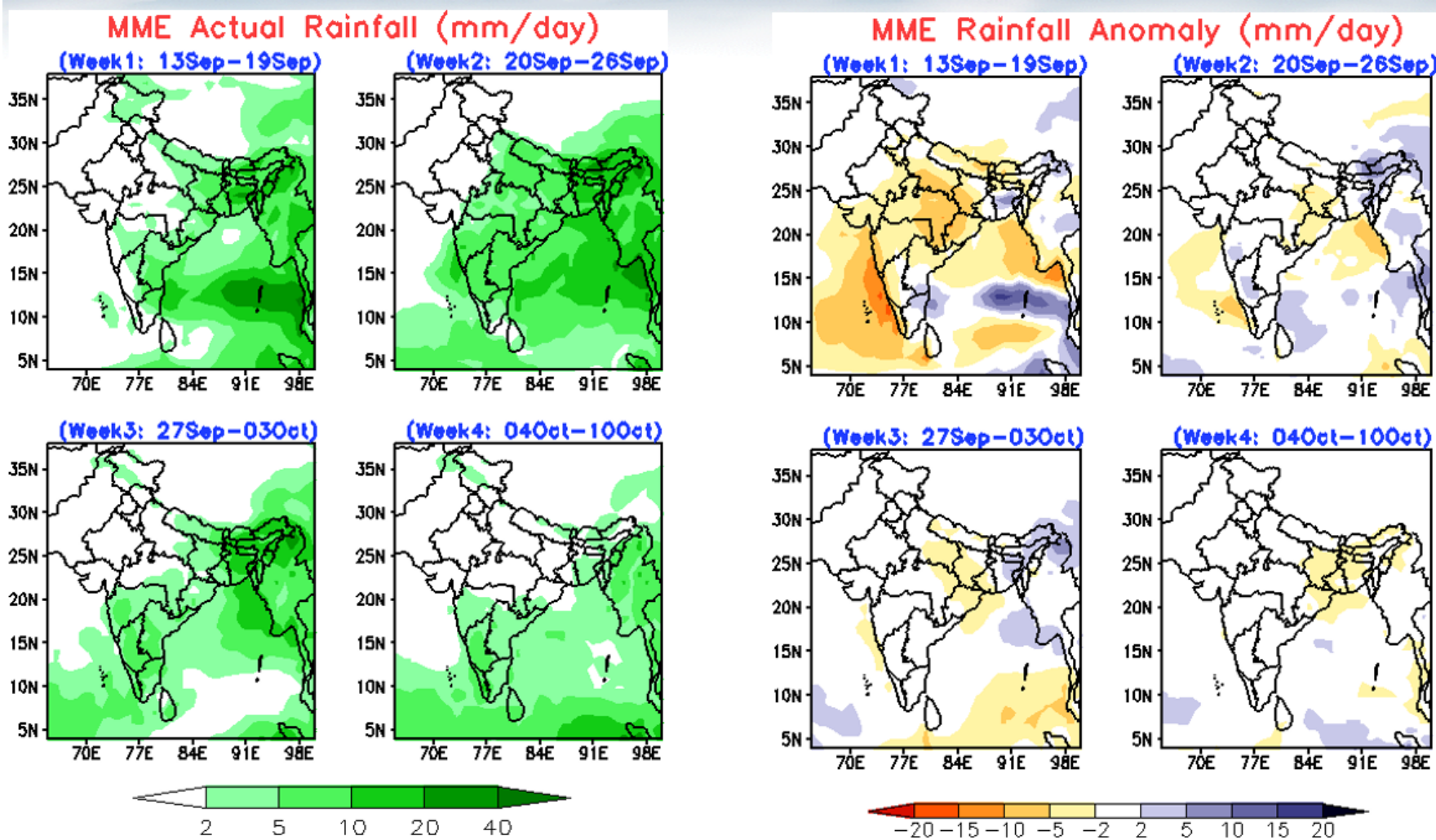


RESEARCH PROGRAM ON Water, Land and Ecosystems

South Asia Drought Monitoring System (SADMS) drought weekly bulletin is produced by International Water Management Institute (IWMI) and is funded by the Indian Council of Agricultural Research (ICAR), the CGIAR Research Program on Water, Land and Ecosystems (WLE) and the Ministry of Agriculture, Forestry and Fisheries (MAFF), Japan. Development of the beta-monitoring system was made possible at this inception through IDMP supported by WMO/GWP. The bulletin supports the government and other users to strengthen the potential use of satellite technology and modeling tools to reduce the impacts on agriculture risks and support in drought contingency plans and mitigation efforts.

Rainfall Summary - Predicted week wise rainfall for South Asia

Multi Model Ensemble (MME) Seasonal Prediction System for 2018 Monsoon Season



- Rainfall for MP, south and north-west Maharashtra, west Karnataka and southern part of Kerala might experience in the next week; east Bhutan, north west Assam, south west Arunachal might experience a slight increase in rainfall, however the rainfall anomaly explains deficit rainfall.
- MP, UP, Bihar, West Bengal, North Odisha might experience decrease in rainfall by beginning of October.
- Gujarat, Rajasthan, Punjab, Haryana, Himachal Pradesh, Uttaranchal may experience deficit rainfall from 13th Sep to 10th Oct.
- Sri Lanka for Central, Northern and Western Provinces explains low rainfall but the condition might improve from mid of September to first week of October.
- Nepal rainfall anomaly explains a decrease in rainfall including Bhutan.
- Overall Pakistan shows no anomaly in rainfall.

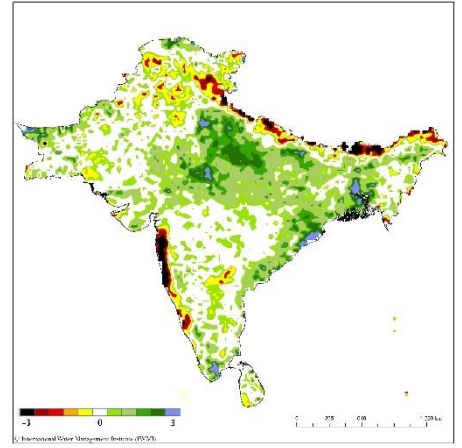
Note: The summary on country specific details described above based on the ERPAS MME information product do not imply the expression of any opinion whatsoever on the part of the IWMI and its partners as well the data provided by IITM.

SOUTH ASIA DROUGHT EARLY WARNING SYTEM (SADEWS)

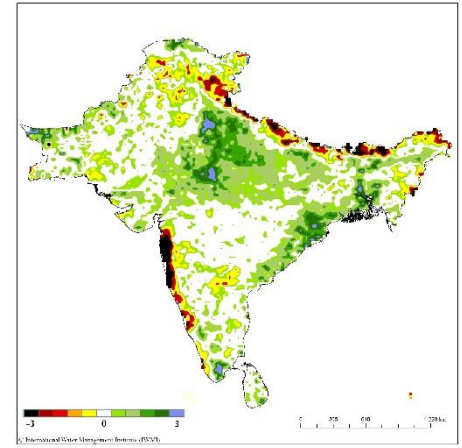
Current Condition: 27 Sep 2018
Forecast Period : 04 Oct and 12 Oct 2018
Standardized Soil Moisture and Runoff Index for regional drought and early warning

SOIL MOISTURE PERCENTILE (SMP)

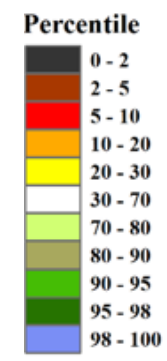
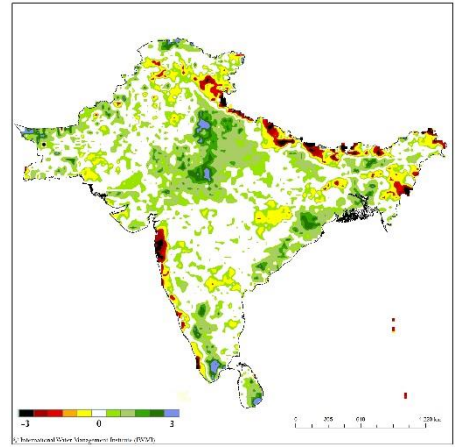
7-day Percentile 27th Sep 2018



7-day Forecast Percentile 04th Oct 2018

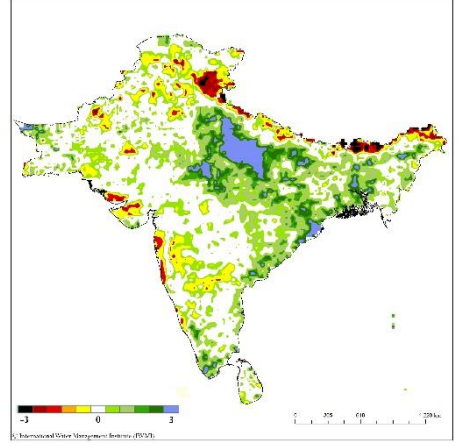


7-day Forecast Percentile 12th Oct 2018

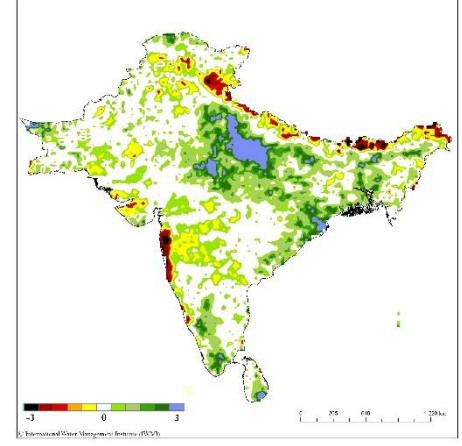


SOIL RUNOFF PERCENTILE (SRP)

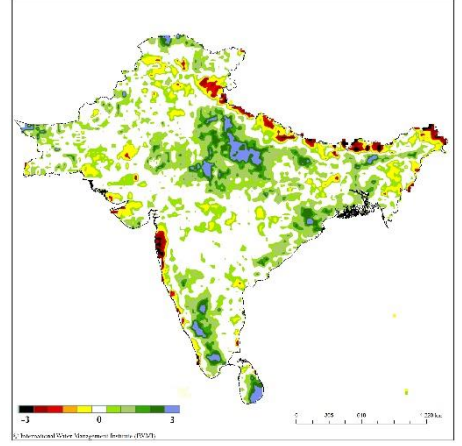
7-day Percentile 27th Sep 2018



7-day Forecast Percentile 04th Oct 2018



7-day Forecast Percentile 12th Oct 2018



SOIL RUNOFF PERCENTILE (SRP)

Summary:

The experimental drought forecast products for research/scientific use based on 27th September 2018 initial condition. These forecast products are based on the real time weekly operational forecast generated by Global ENsemble (GENS), a weather forecast model made up of 21 separate forecasts, or ensemble members developed at The National Centers for Environmental Prediction (NCEP), NOAA.

Drought Forecast Outlook:

- Rainfall of UP, Bihar, Manipur, Chhattisgarh, Jharkhand, North of West Bengal, Kerala, Manipur, Nagaland, Meghalaya will be decreasing while rainfall of Northern Part of Punjab, Maharashtra, Karnataka, Telangana, Arunachal Pradesh, Rajasthan and Haryana will be increasing slightly in coming two weeks.
- Initial condition on the Soil Runoff Index (SRI) explains similar trend to SSI.
- Dryness is increasing in the following week and it will be decreasing in the second week of October over western belt of India such as western Maharashtra and Karnataka.
- South and South west of Sri Lanka will get more rain when rainfall in Jammu & Kashmir and Bhutan is increasing slightly while rainfall is decreasing in Nepal.
- The areas are in deficit rainfall condition which may affect the crop productivity and advance need for State and Local authorities for better planning and coordination on water resources management.

The SADEWS is regional scale early warning system developed as a collaborative project between International Water Management Institute (IWMI) and Indian Institute of Technology – Gandhinagar (IIT-GN).

Disclaimer: The designations employed and the presentation of material in this information product do not imply the expression of any opinion whatsoever on the part of the International Water Management Institute (IWMI) and its partners concerning the legal or development status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. The views expressed in this information product are those of the author(s) and do not necessarily reflect the views or policies of IWMI.

INDIA – Monthly Rainfall Condition (Actual vs. Anomaly)

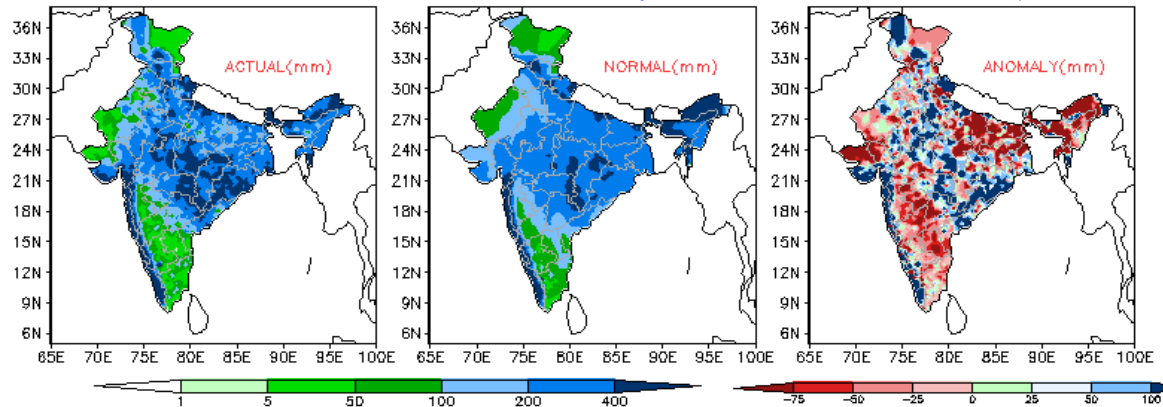
Actual Rainfall – July 2018

RAINFALL OVER THE COUNTRY FOR JUL 2018

ACTUAL – 272.4 mm NORMAL – 289.2 mm (94.2 % of Long Period Average)

(Based on real time data)

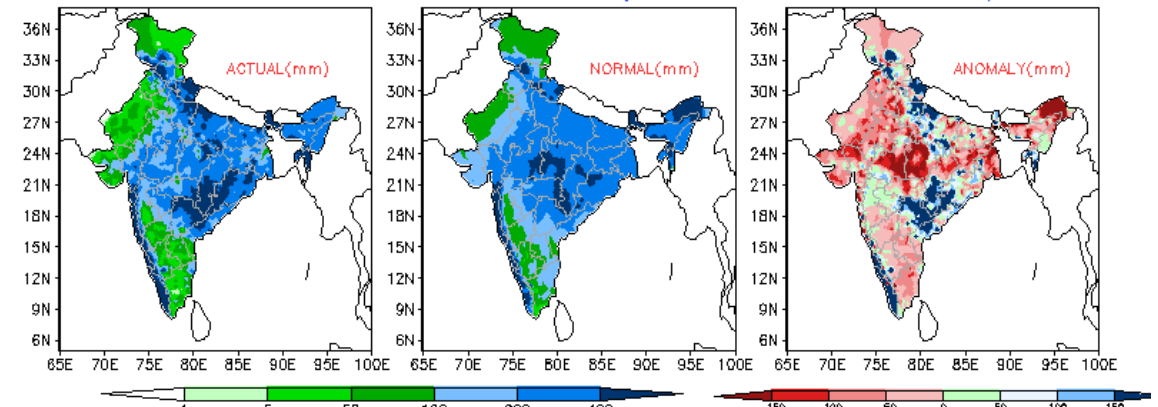
(CLIMATE MONITORING AND ANALYSIS GROUP)



Actual Rainfall – Aug 2018

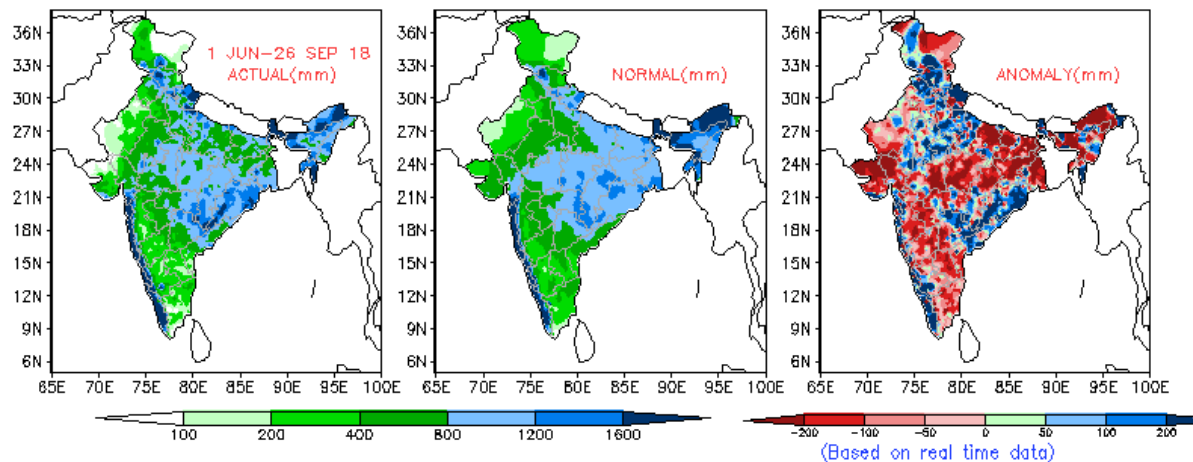
RAINFALL OVER THE COUNTRY FOR AUG 2018

(CLIMATE MONITORING AND ANALYSIS GROUP)



Actual Rainfall – Seasonal 2018

CLIMATE MONITORING AND ANALYSIS GROUP



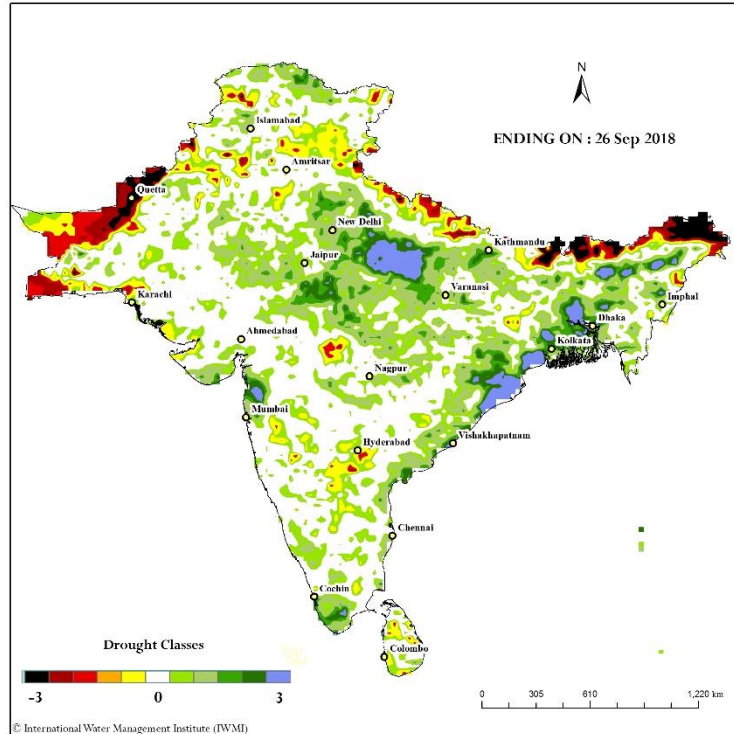
- Overall there is an decrease in rainfall for the month of August compared to the long-term anomaly, however some coastal areas in Kerala, southern Gujarat, Odisha, Chhattisgarh, along with south of Jammu & Kashmir had excess rainfall.
- Month of July has experienced both positive and negative anomalies across India. An excess rain fall was received along the southwest coastal line till Gujarat and some parts of central India (Odisha, Chhattisgarh, MP, UP, Uttaranchal) and isolated patches in northern and southern parts of Jammu & Kashmir.
- There has been a slight reduction in rainfall in the month of August over MP, Rajasthan and Gujarat.
- Overall there has been an excess rainfall along the western coast of India.
- Central, Western and Northeast (except Manipur) parts of the region along with Tamil Nadu are facing serious deficit of rainfall. This might highly affect the crop productivity during this year's Kharif season.

Data Source: IMD

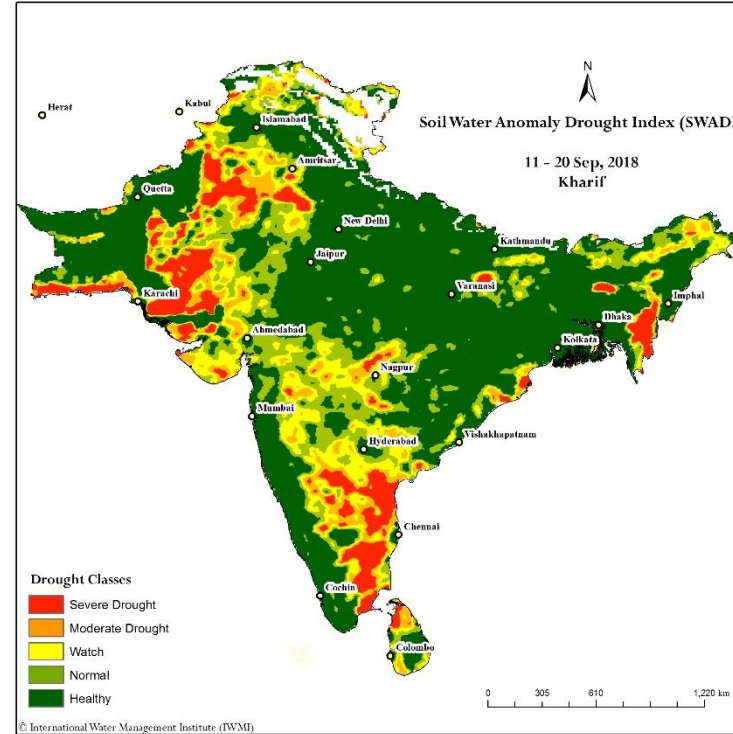
Note: Simple qualitative assessment on the performance on rainfall condition was described here to cross compare with SADMS – IDSI products for evaluation purpose only.

South Asia Drought Indices – A Comparison & Assessment

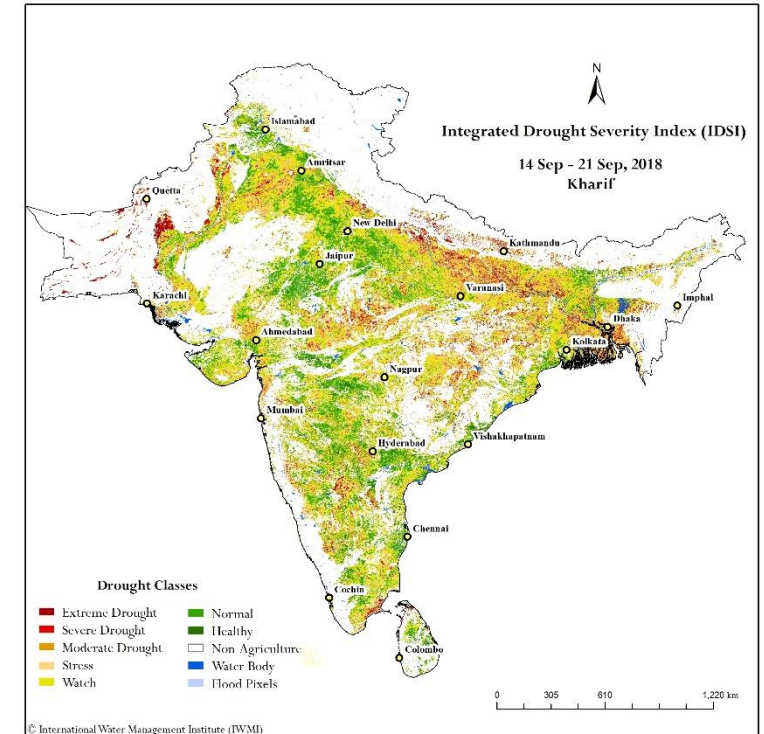
SA-DEWS



SWADI

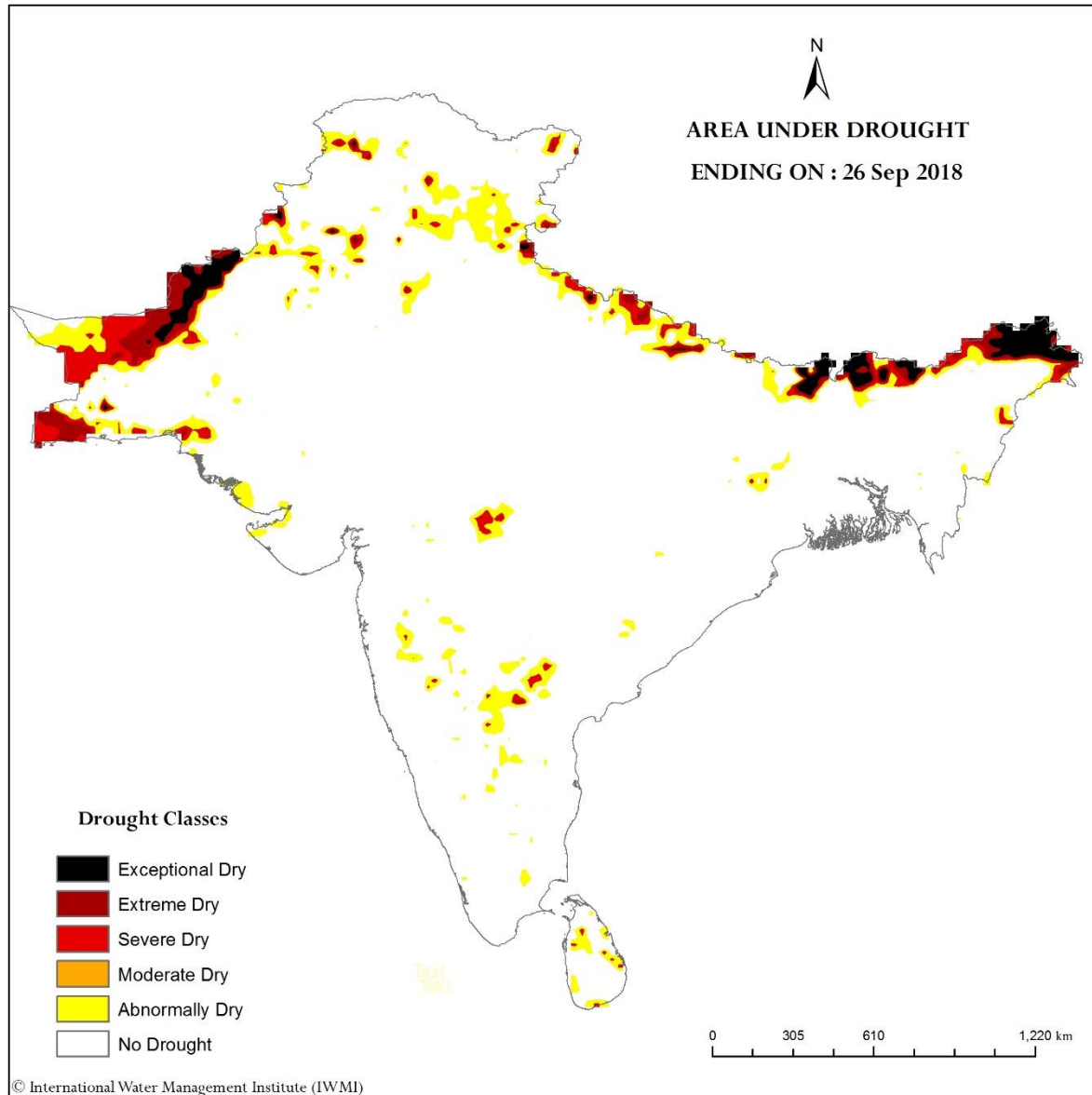


IDSi



- South Asia-Drought Early Warning System (SA-DEWS) is an integrated approach based on satellite estimates of rainfall temperature, wind and soil type utilized in VIC model and the derived outputs namely Standardized Precipitation Index (3-Month), Standardized Soil Moisture Index (SSI) and Standardized Runoff Index (SRI).
- Soil Water Anomaly Drought Index (SWADI) is derived from satellite based decadal soil moisture product of ASCAT provided by EUMETSAT.
- Integrated Drought Severity Index (IDSI) is an integrated index that has been formulated using VCI, TCI & PCI at 500m resolution for agricultural land-use over South Asia.
- It can be observed, that during this time period, all the three indices shows a relation with each other. The peninsular India is reviving from the drought situation, except Tamil Nadu, Karnataka and AP.

South Asia Drought Forecast



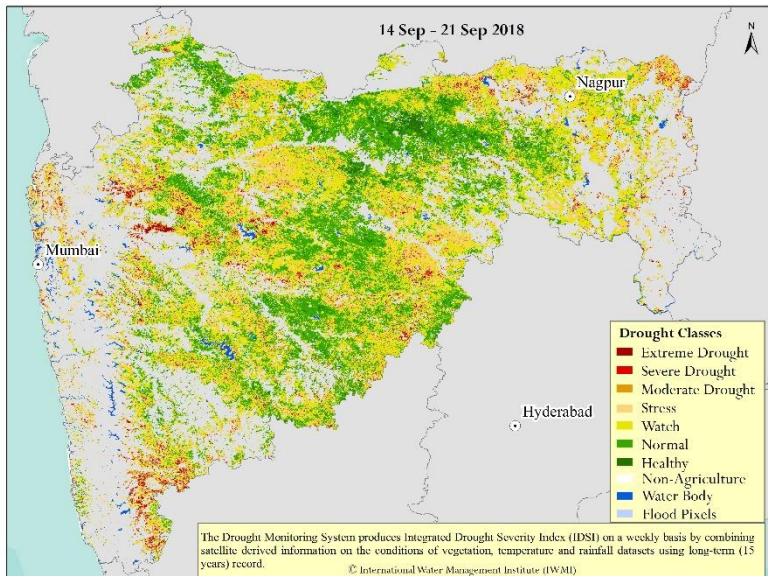
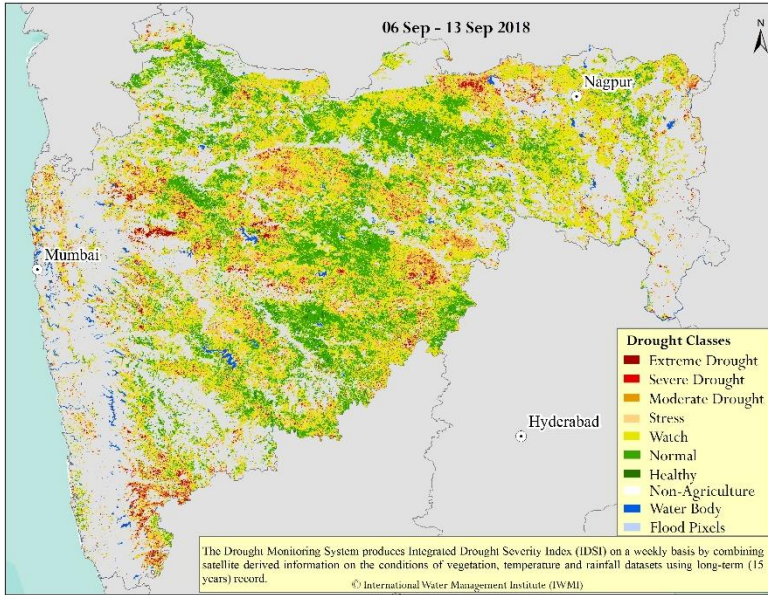
Summary:

- Using the initial condition i.e. 26th September 2018 based on satellite rainfall estimates of 3B42RT daily time-step integrates in the VIC model and the derived outputs namely Standardized Precipitation Index (3-Month), Standardized Soil Moisture Index (SSI) and Standardized Runoff Index (SRI)
- The extreme values of all three conditions are statistically combined to generated areas under drought for entire South Asia
- Extreme dry condition of MP, Talangana and few patches of Northern Karnataka have decreased while few patches of Maharashtra have increased.
- Jammu & Kashmir, and parts of northeastern belt are observed to have Severe to Extreme/Exceptional dry condition. Also, Bhutan, Pakistan, Nepal and few patches of Sri Lanka are under extremely/exceptionally severe drought condition.
- *Reference to IMD SPI data is well correlated to the area under drought predicted by drought algorithm.*

India – State wise analysis



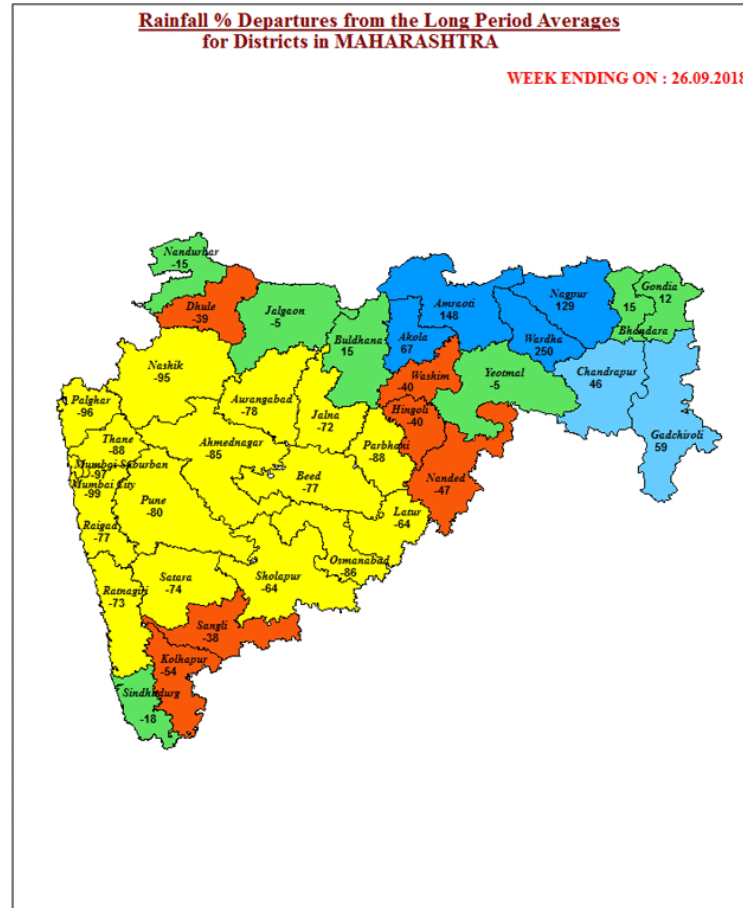
South Asia Drought Monitoring System (SADMS) – Agriculture Assessment (Maharashtra)



INDIA METEOROLOGICAL DEPARTMENT RMC MUMBAI

**Rainfall % Departures from the Long Period Averages
for Districts in MAHARASHTRA**

WEEK ENDING ON : 26.09.2018

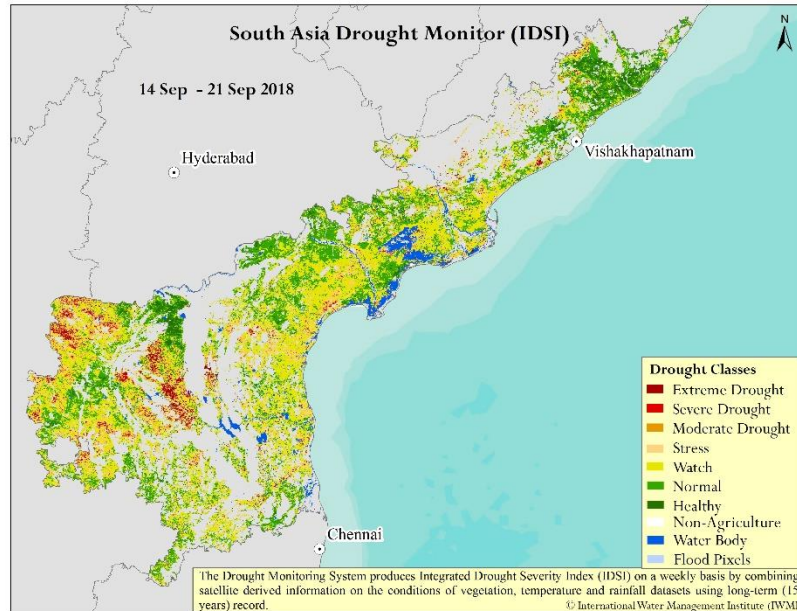
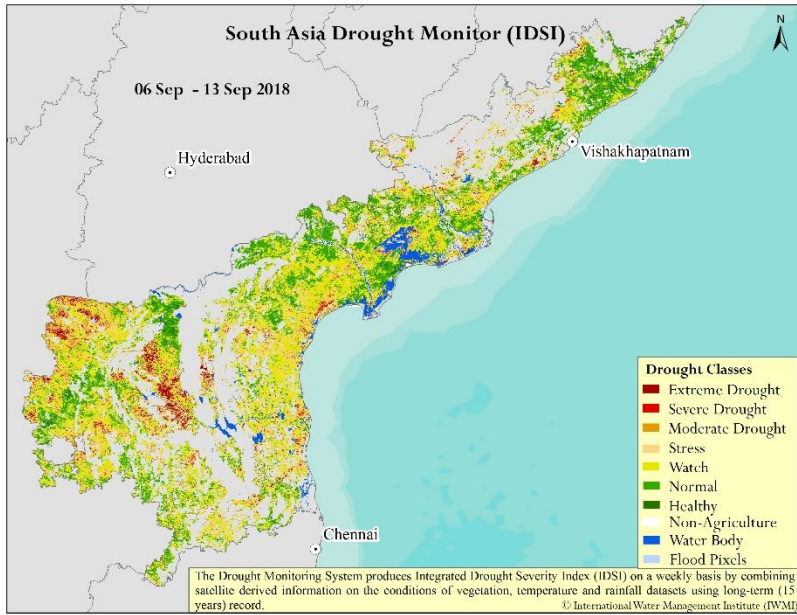


LEGEND: ■ L. EXCESS (+60% OR MORE) ■ EXCESS (+20% TO +59%) ■ NORMAL (+19% TO -19%)
■ DEFICIENT (-20% TO -59%) ■ L. DEFICIENT (-60% TO -99%) ■ NO RAIN (-100%) ■ NO DATA

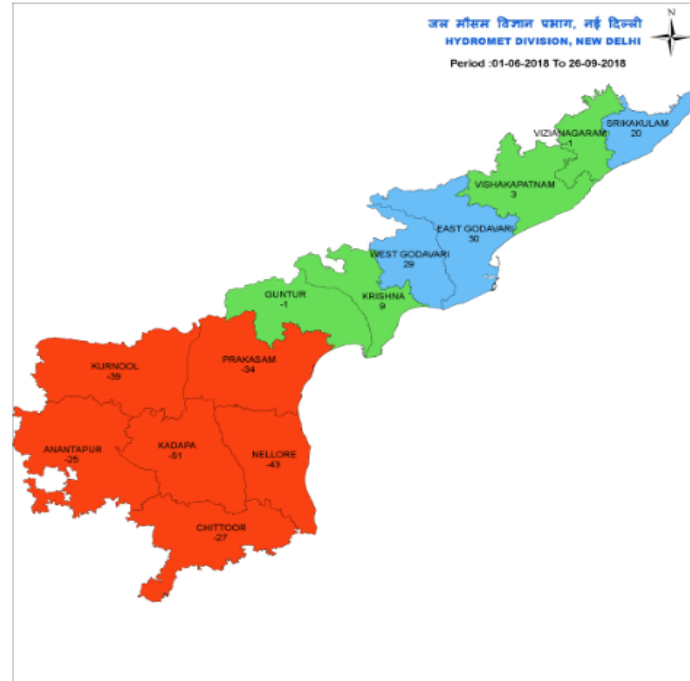
Summary:

- SADMS framework was applied for the agriculture drought monitoring in Maharashtra for current obtained mainly from satellite remote sensing data. The index (Integrated Drought Severity Index – IDSI), Indian Meteorological Rainfall maps were analysed to understand rainfall deficit which could help in validating the drought maps with the absence of in-situ observations.
- Akola, Amravati, Wardha, Yavatmal and Buldana districts are from “watch” drought category to “Normal” or “healthy” drought category.
- Rainfall deficit in middle part and west part of the state has increased the vegetation stress in the agricultural land, which is clearly reflected in the IDSI. ‘Stress’ condition has decreased most of the State; while isolated patches of Nashik, Ahmednagar, Nanded and Kolhapur show severe or extreme drought condition. Similar pattern has been revealed by seasonal rainfall report from IMD.

South Asia Drought Monitoring System (SADMS) – Agriculture Assessment (Andhra Pradesh)



DISTRICT RAINFALL DEPARTURE MAP - ANDHRA PRADESH



Rainfall Status (Avg from 01-06-2018 to till date)
Actual **453.5mm**, Deviation **-15.8%**

District-Wise, Month-Wise Rainfall Status from 01/06/2018

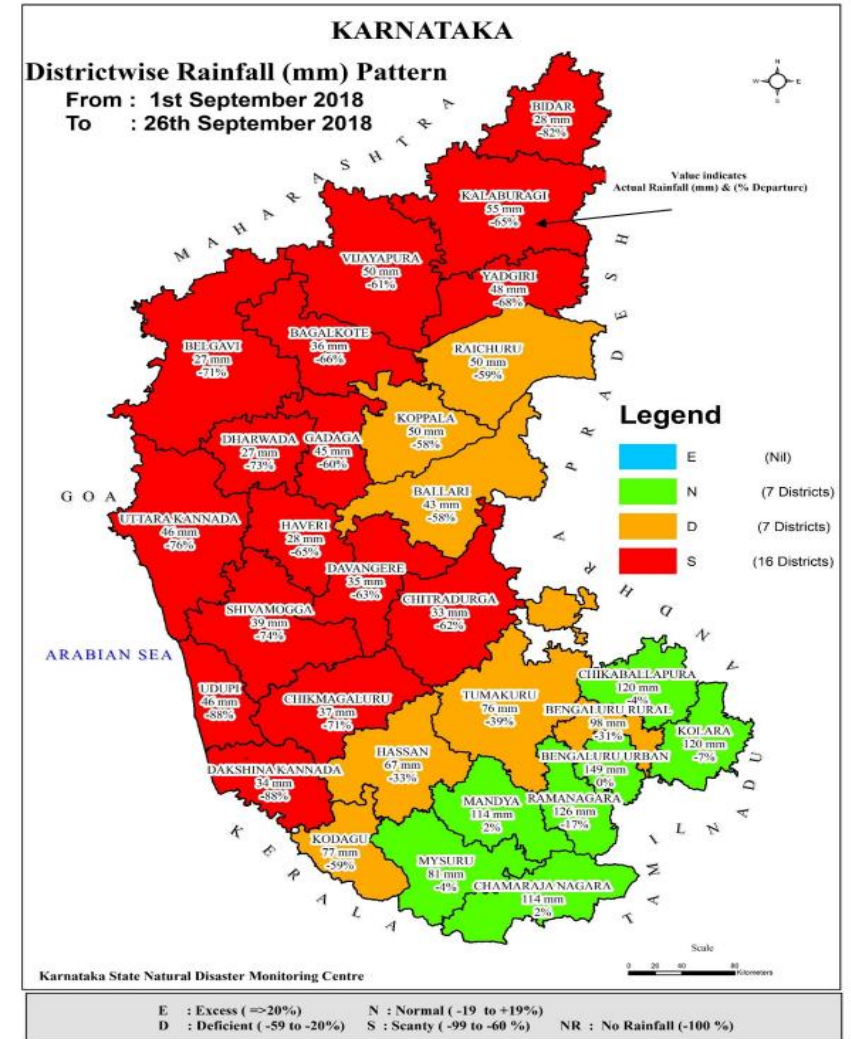
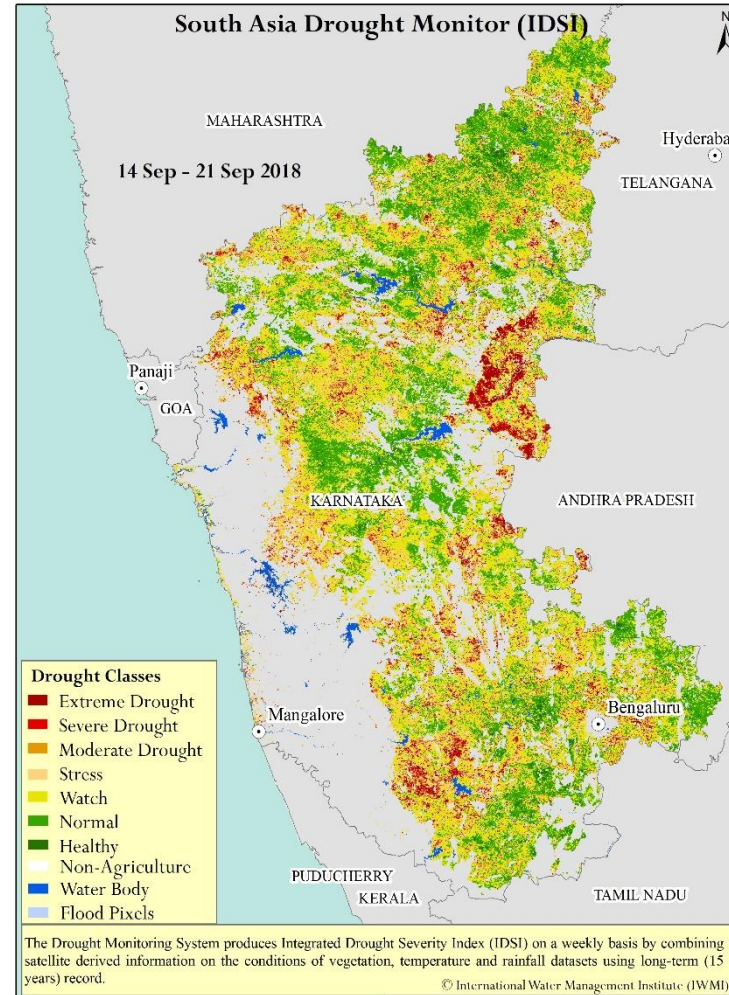
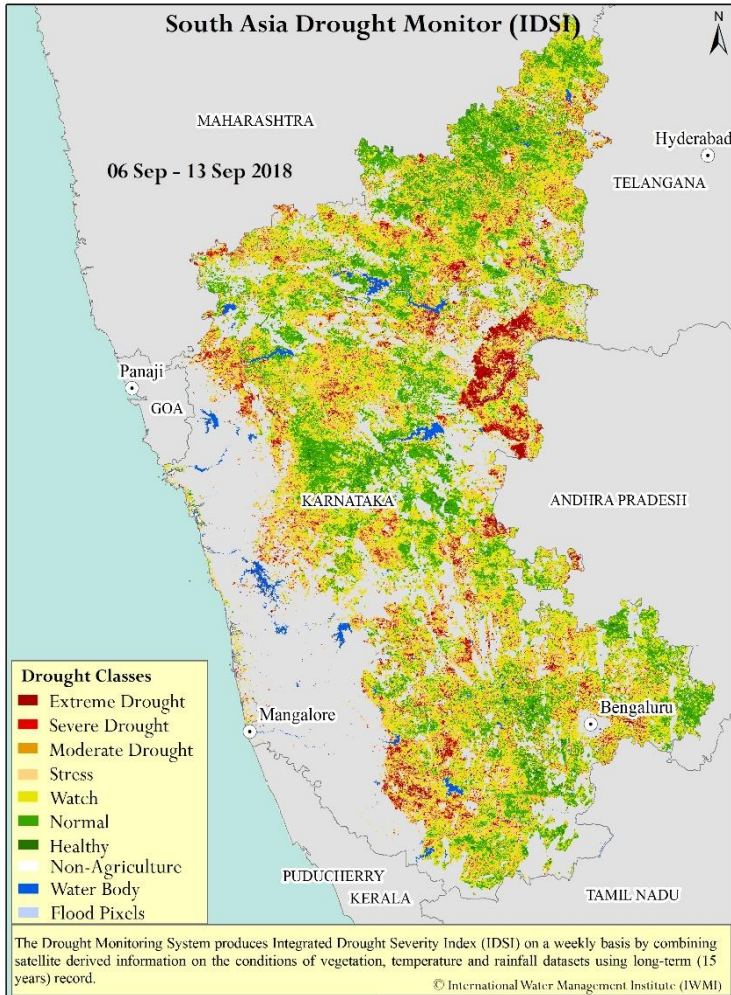
District	Actual	Normal	Deviation(%)	Status
Srikakulam	762.7	688.4	10.8	Normal
Vizianagaram	625.5	676.2	-7.5	Normal
Vishakapatnam	678.8	692.9	-2.0	Normal
East Godavari	798.6	748.1	6.8	Normal
West Godavari	888.3	773.9	14.8	Normal
Krishna	641.5	665.9	-3.7	Normal
Guntur	395.0	507.1	-22.1	Deficient
Prakasham	217.9	367.6	-40.7	Deficient
Nellore	172.6	315.9	-45.4	Deficient
Chittoor	281.6	420.3	-33.0	Deficient
Kadapa	195.1	382.7	-49.0	Deficient
Anantapur	209.8	321.2	-34.7	Deficient
Kurnool	262.1	440.5	-40.5	Deficient
State	453.5	538.5	-15.8	Normal

Data Source: APSDPS

Summary:

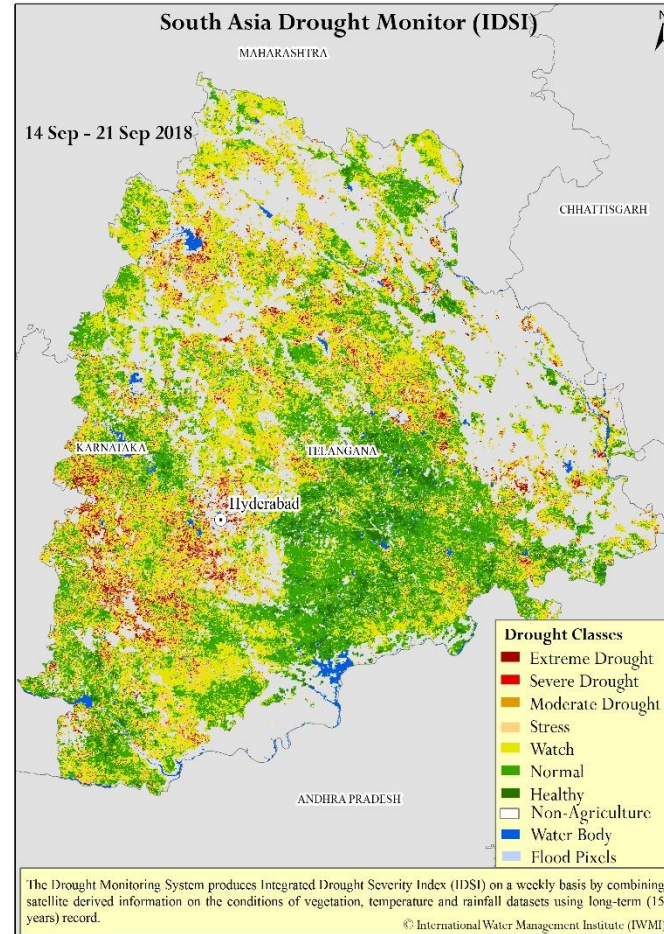
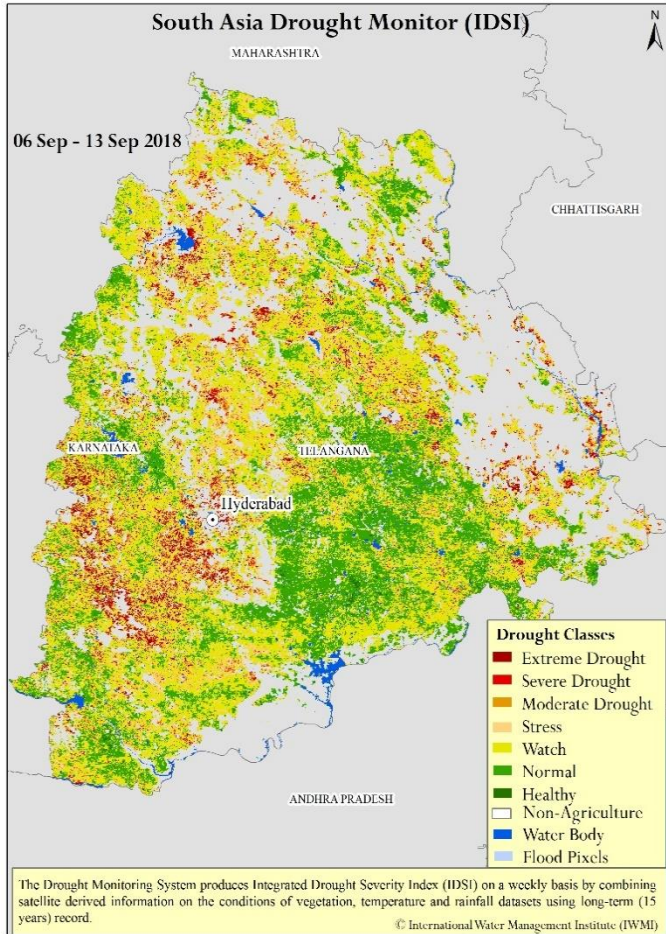
- Out of the 13 districts in A.P., 7 districts had low rainfall (Guntur, Prakasham, Nellore, Chittoor, Kadapa, Anantapur and Kurnool) from June 1 to 26 Sep 2018;
- 'Stress' category is still same as previous map all over the district.
- Prakasham, Nellore, Chittoor, Kadapa, Anantapur, Tumkur and Kurnool show Sever or Extreme patches more than other districts cover.

South Asia Drought Monitoring System (SADMS) – Agriculture Assessment (Karnataka)

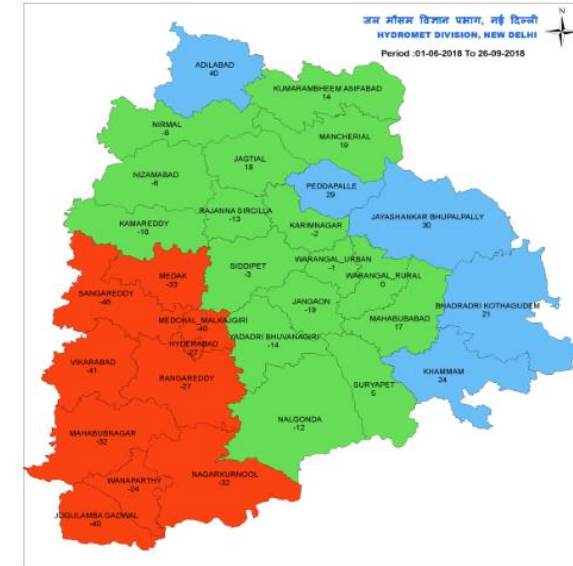


The Integrated Drought Severity Index (IDSI) for Karnataka were assessed at district level. The condition of vegetation has been slightly affected along northern, southern and eastern areas of the State, except normal category for a few patches at the central region. Extreme drought condition in the central eastern districts has not changed drastically. 'Normal' category has increased from 'watch' category in Kolar, Bangalore urban, Mandya, Mysore and Chamrajnagar districts and these districts are having noticeable rainfall according to rainfall map.

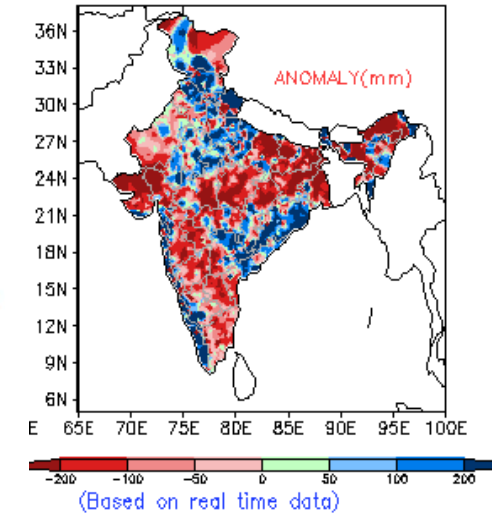
South Asia Drought Monitoring System (SADMS) – Agriculture Assessment (Telangana)



DISTRICT RAINFALL DEPARTURE MAP - TELANGANA



01 June – 26 Sep 2018

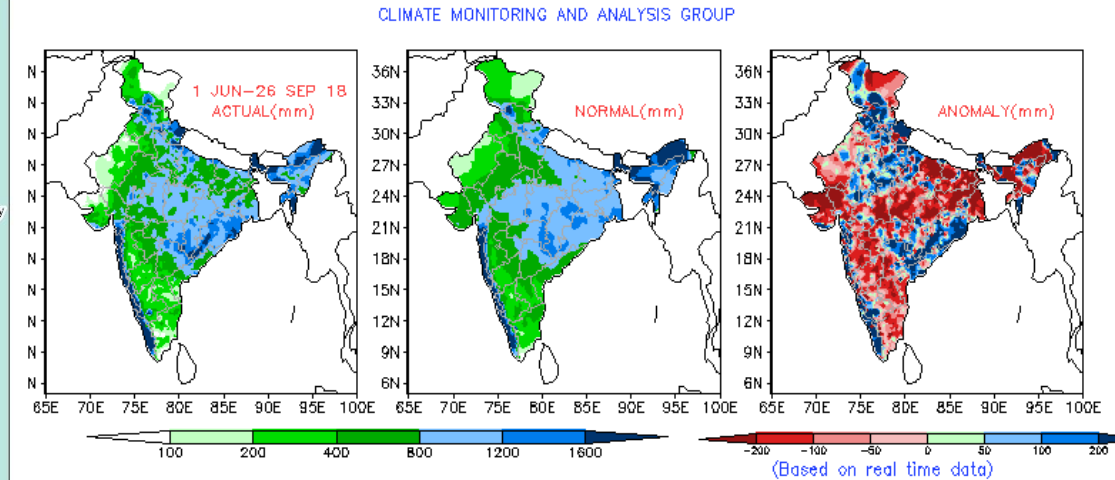
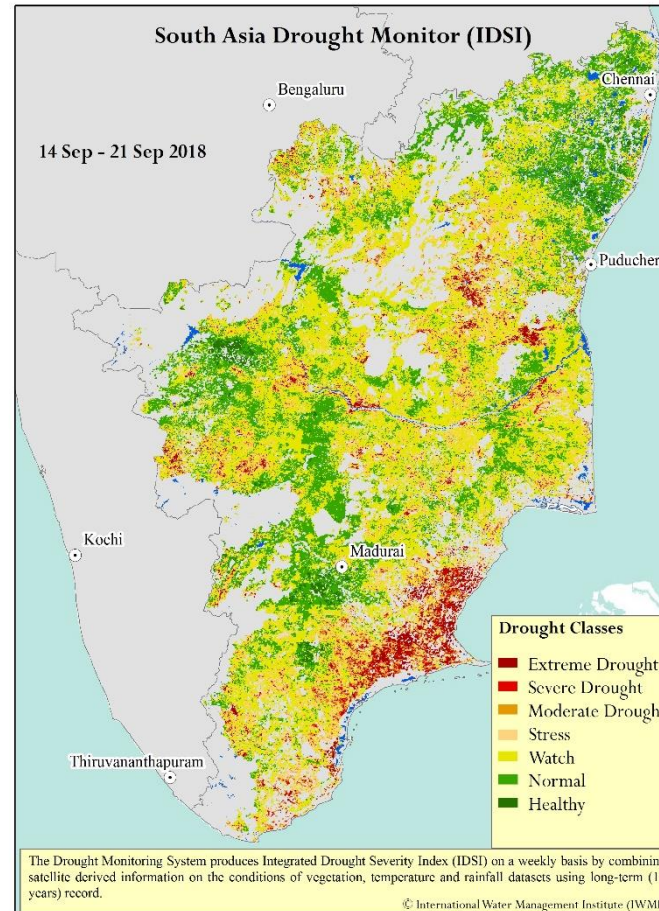
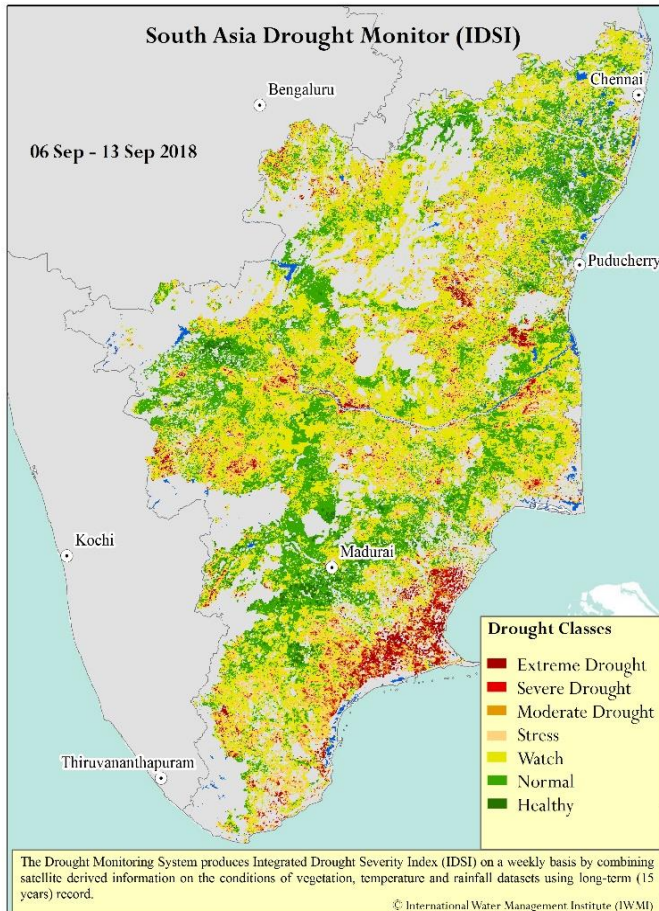


Summary:

The Integrated Drought Severity Index (IDSI) for Telangana was assessed at district level. There seems to be decrease in stress levels in the State but there are patches of severe or extreme drought conditions most of the state. Western States are also observed to have moved from stress, Moderate or severe category to normal category, while south eastern part of Telangana moved from normal/watch category to healthy.

South Asia Drought Monitoring System (SADMS) – Agriculture Assessment (Tamil Nadu)

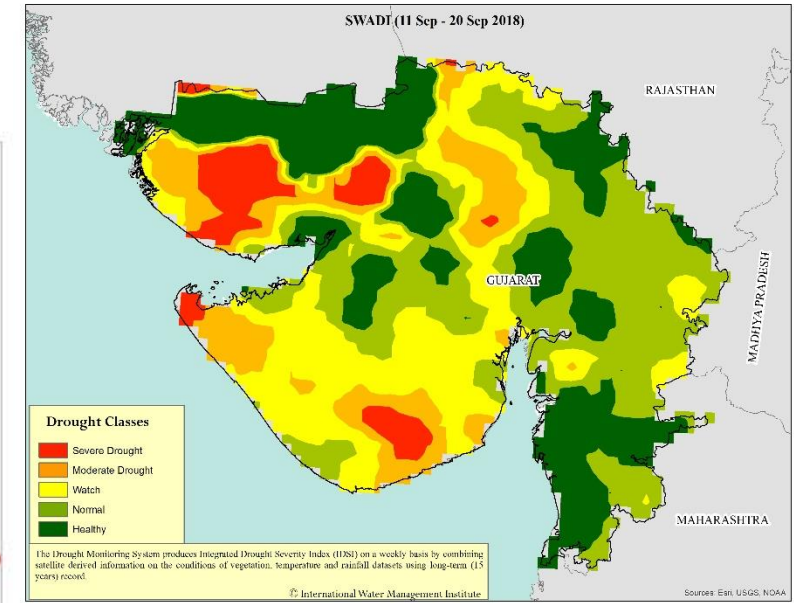
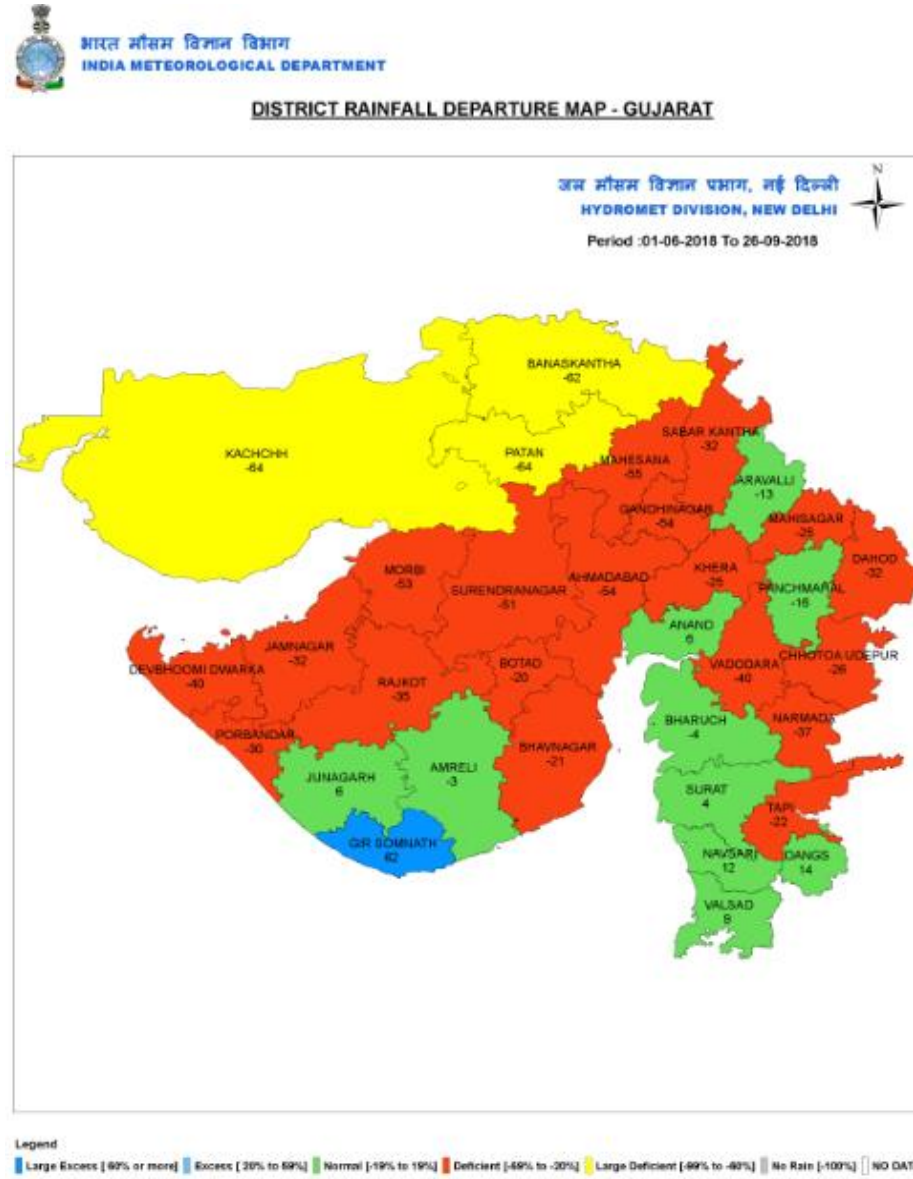
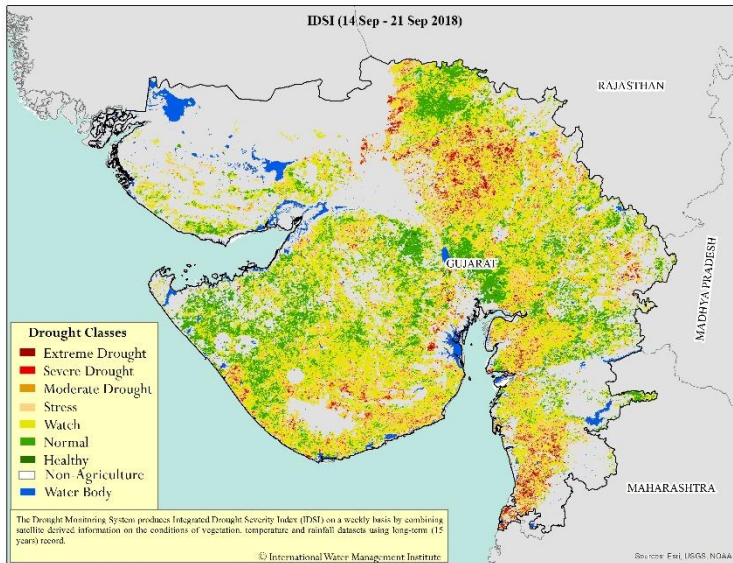
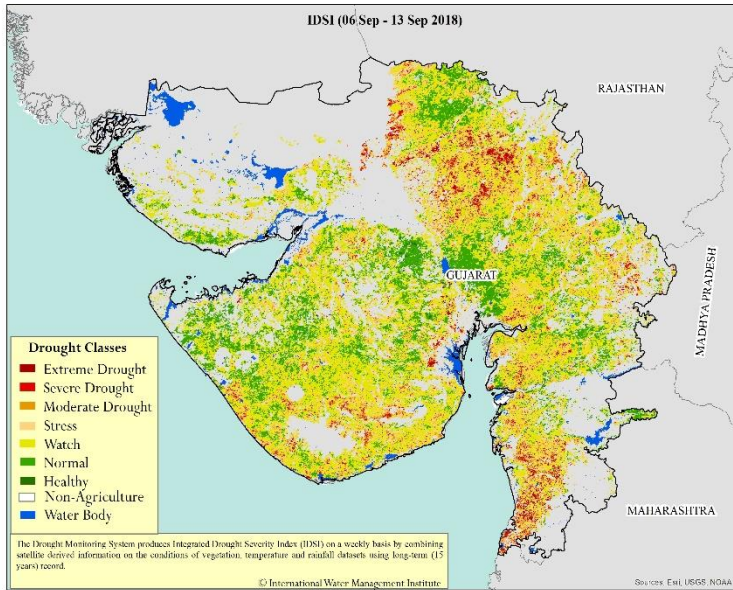
01 June – 26 Sep 2018



Summary:

- Overall condition of the stress has increased from previous analysis cycle. Also south-east and north-central parts of Tamil Nadu seem to have higher stress similar to the week ending on 13th of September. Isolated patches of Virudhunagar, Sivaganga, Pudukkottai, Tanjavur, Madurai and Nagapattinam have slightly moved from normal to watch category.
- Overall, it can be observed that all districts have similar drought classes as compared to the previous week except the locations mentioned above.

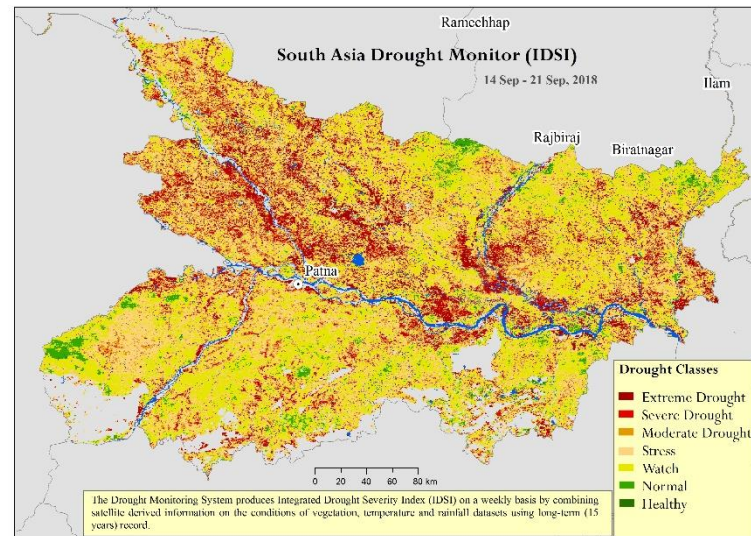
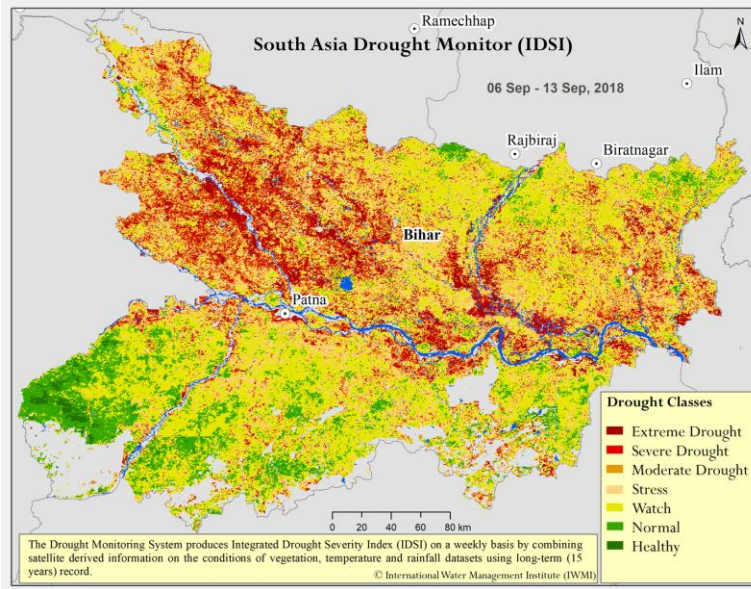
South Asia Drought Monitoring System (SADMS) – Agriculture Assessment (Gujarat)



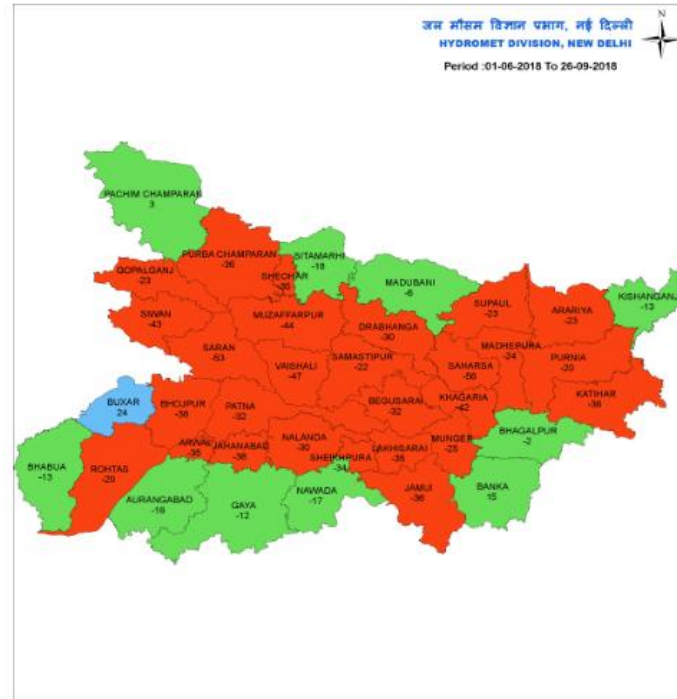
Summary:

- Overall condition of the stress is lower compared to the previous analysis
- Banas Kantha, Vadodara, Northern part of Surat, West part of Anand, Surengranagar, Jamanagar, Rajkot and Junagar have slightly changed to Normal category.
- Overall, it can be observed that all districts are with few patches of higher drought classes as compared to the previous week.

South Asia Drought Monitoring System (SADMS) – Agriculture Assessment (Bihar)



DISTRICT RAINFALL DEPARTURE MAP - BIHAR



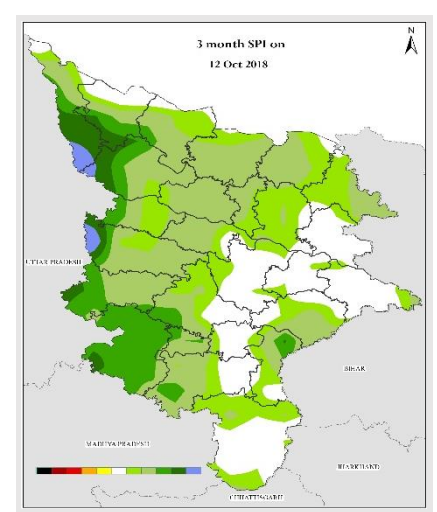
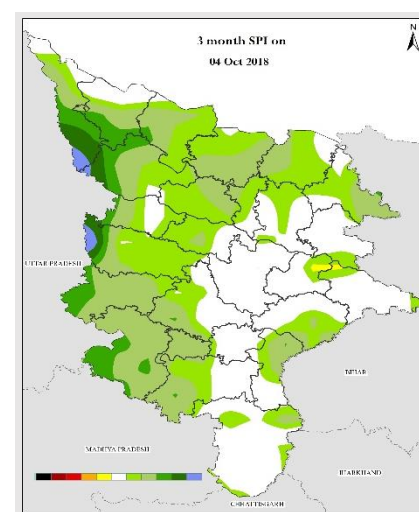
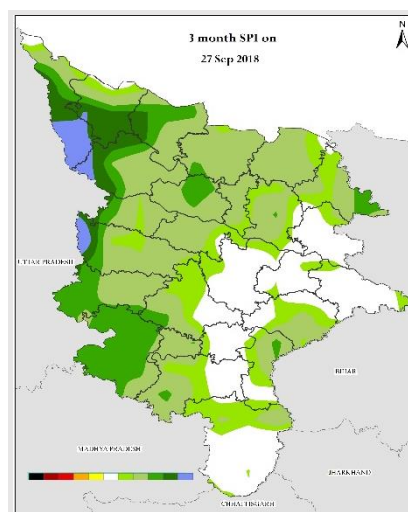
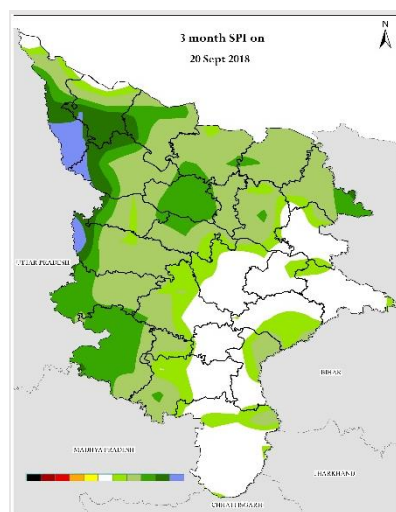
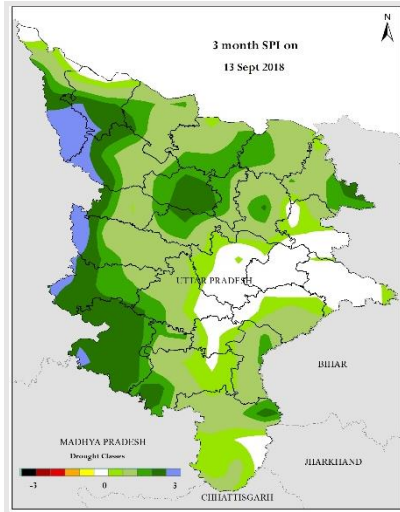
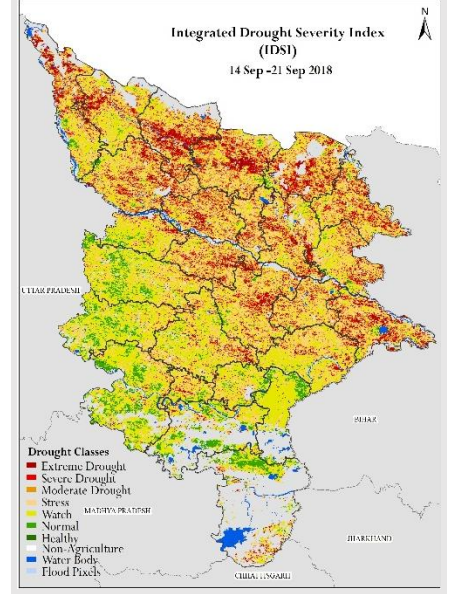
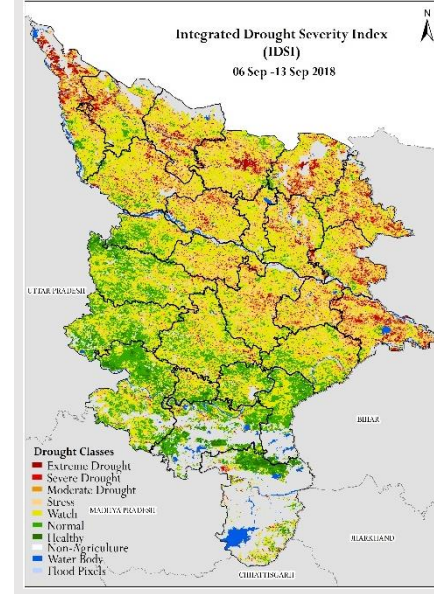
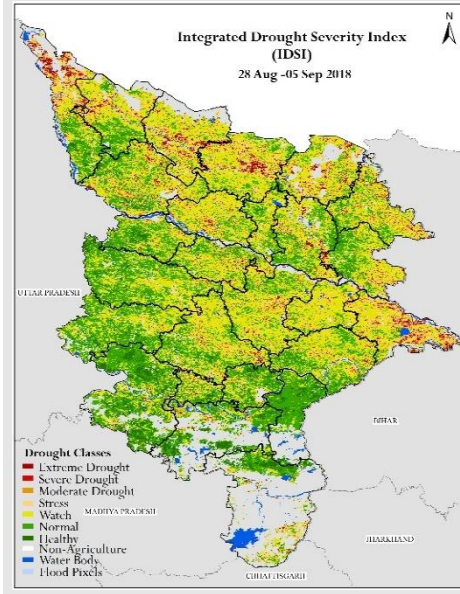
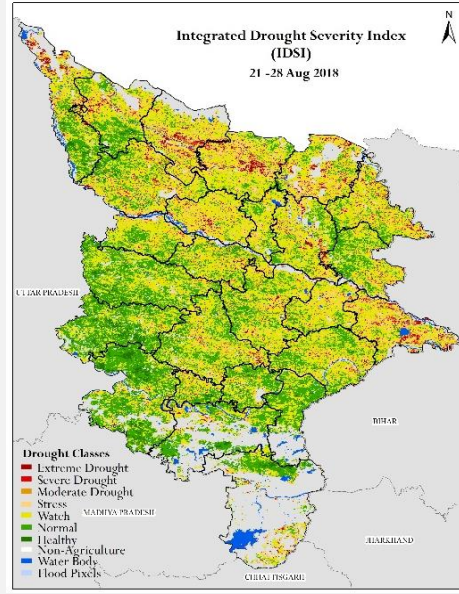
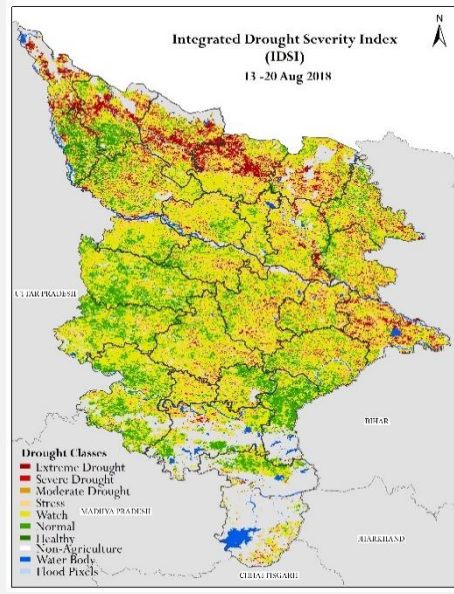
DISTRICT-WISE RAINFALL DISTRIBUTION

S NO	MET. SUBDIVISION/UT/STATE/DISTRICT	Week:13-09-2018 To 19-09-2018				Period:01-06-2018 To 19-09-2018			
		ACTUAL (mm)	NORMAL (mm)	%DEP.	CAT.	ACTUAL (mm)	NORMAL (mm)	% DEP.	CAT.
1	ARARIYA	62.7	73.1	-14%	N	998.2	1263.9	-21%	D
2	ARWAL	3.1	54.5	-94%	LD	485.5	745.3	-35%	D
3	AURANGABAD	0.0	52.3	-100%	NR	681.5	822.5	-17%	N
4	BANKA	0.0	48.8	-100%	NR	933.8	780.6	20%	E
5	BEGUSARAI	0.7	46.3	-99%	LD	597.9	850.2	-30%	D
6	BHABUA	0.0	71.5	-100%	NR	846.0	943.7	-10%	N
7	BHAGALPUR	11.0	53.3	-79%	LD	883.0	894.3	-1%	N
8	BHOJPUR	0.0	59.9	-100%	NR	550.4	875.8	-37%	D
9	BUXAR	0.0	62.4	-100%	NR	1046.3	833.6	26%	E
10	DRABHANGA	34.7	36.5	-5%	N	823.1	859.3	-27%	D
11	GAYA	0.0	40.5	-100%	NR	748.0	828.9	-10%	N
12	GOPALGANJ	0.0	76.9	-100%	NR	718.9	942.1	-24%	D
13	JAHANABAD	3.2	61.7	-95%	LD	478.7	787.5	-39%	D
14	JAMUI	0.0	49.2	-100%	NR	575.9	888.6	-34%	D
15	KATIHAH	13.8	59.7	-77%	LD	639.7	1007.2	-36%	D
16	KHAGARIA	8.3	73.7	-89%	LD	579.7	993.6	-40%	D
17	KISHANGANJ	82.5	84.0	-2%	N	1488.2	1648.8	-10%	N
18	LAKHISARAI	0.0	50.1	-100%	NR	594.7	890.0	-33%	D
19	MADHEPURA	33.9	57.7	-41%	D	841.0	1073.7	-22%	D
20	MADUBANI	51.2	41.2	24%	E	966.3	1000.7	-3%	N
21	MUNGER	1.2	50.1	-98%	LD	672.7	890.0	-24%	D
22	MUZAFFARPUR	1.4	57.4	-98%	LD	512.9	920.5	-44%	D
23	NALANDA	0.0	52.7	-100%	NR	568.3	816.8	-30%	D
24	NAWADA	0.0	41.7	-100%	NR	717.1	842.4	-15%	N
25	PACHIM CHAMPARAN	104.5	89.5	17%	N	1296.4	1210.6	7%	N
26	PATNA	1.2	55.1	-98%	LD	598.8	876.5	-32%	D
27	PURBA CHAMPARAN	7.8	52.5	-85%	LD	628.2	960.3	-35%	D
28	PURNIA	99.8	71.7	39%	E	1011.7	1212.5	-17%	N
29	ROHTAS	0.0	56.3	-100%	NR	853.6	795.1	-18%	N
30	SAHARSA	17.3	80.0	-78%	LD	591.4	1325.0	-55%	D
31	SAMASTIPUR	16.0	63.6	-75%	LD	748.8	940.5	-20%	D
32	SARAN	0.0	56.6	-100%	NR	432.6	913.8	-53%	D
33	SHEIKHPURA	0.2	42.5	-99%	LD	519.9	805.1	-35%	D
34	SHEOHAR	10.5	45.3	-77%	LD	688.7	1030.2	-33%	D
35	SITAMARHI	22.2	45.3	-51%	D	866.6	1030.2	-16%	N
36	SIWAN	0.2	76.8	-99%	LD	536.3	945.6	-43%	D
37	SUPAUL	47.8	57.4	-17%	N	781.3	998.0	-21%	D
38	VAISHALI	0.0	45.0	-100%	NR	491.4	945.5	-48%	D

Summary:

- The drought severity in all parts of Bihar seems to have raised one class towards severity in the week ending on 21st of September, compared to previous week.
- This has happened because of all the district shows deficit rainfall compared to normal for this monsoon season. 25 Districts out of the 38 districts are experiencing scarcity of rainfall this season which is largely to affect the rainfed agricultural system of Bihar.

South Asia Drought Monitoring System (SADMS) – Agriculture Assessment (Eastern UP)



Summary:

• There can be seen increasing of drought condition by 21st September all over the state; Stress condition is expected to increase further by second week of October.

Thanks.....

Disclaimer

All content within this bulletin is based upon the most current available data. As the drought is a dynamic situation, the current realities may differ from what is depicted in this document. The product has not been validated and used only the weather forecast and remote sensing observation. We welcome the feedback from the end-users and request you to provide field observations and any other details which can improve the product quality and prediction skills in the near future.

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