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केवल शासकीय

उपयोग हेतु

एकीकृत जलवर्षपुस्तिका

जून 2017- मई 2018

नर्मदा बेसिन

INTEGRATED WATER YEAR BOOK

JUNE 2017– MAY 2018

NARMADA BASIN

केन्द्रीय जल आयोग

नर्मदा बेसिन संगठन भोपाल

मार्च 2019

Central Water Commission

Narmada Basin Organisation, Bhopal

March 2019

प्रस्तावना

राष्ट्रीय जल नीति में जल संसाधन से सम्बंधित आकड़ों के एकत्रीकरण एवं उनकी उपलब्धता हेतु सूचना केंद्र के मानकीकरण एवं आधुनीकीकरण पर जोर दिया गया हैं ताकि इस कार्य में संलग्न केंद्र सरकार एवं राज्य सरकार के विभिन्न विभागों को उच्चस्तरीय आकड़े सुगमता से उपलब्ध हो सके तथा इन आकड़ों के विश्लेषित किये जाने की क्षमता बढाई जा सके | इसका महत्व इसलिए भी है कि इससे जल संसाधनों के अधिकतम उपयोग हेतु विभिन्न कार्यों के लगातार बढती मांग के परिपेक्ष्य में प्रभावी योजनायें बनाई जा सकती हैं |

केन्द्रीय जल आयोग, जल संसाधनों के विकास में संलग्न भारत सरकार, जल संसाधन, नदी विकास और गंगा संरक्षण मंत्रालय के अंतर्गत देश की एक शीर्षस्थ तकनीकी संस्था हैं | इस संस्था द्वारा जल-विज्ञानीय आकड़ों के एकत्रण से लेकर परियोजनाओं के मूल्यांकन, अभिकल्पन, प्रबोधन तथा परिचालन से सम्बंधित कार्य किये जा रहे हैं | नर्मदा एवं उसकी सहायक नदियों पर 14 स्थलों पर नर्मदा बेसिन संगठन के अंतर्गत नर्मदा मंडल, भोपाल एवं नर्मदा के 2 स्थलों पर माही एवं तापी बेसिन संगठन के तापी मंडल, सूरत द्वारा जल-विज्ञानीय आकडे एकत्रित किये जाते हैं, जिनका संकलन इस पुस्तिका में किया जाता गया हैं | इन आकड़ों के अतिरिक्त मध्य प्रदेश के जल संसाधन विभाग के अंतर्गत नर्मदा नदी पर स्थित बिजौरा स्थल के आकड़ों को संकलित कर कुल 17 जल विज्ञानीय स्थलों के आकडे इस पुस्तिका में संकलित किये गए हैं |

जल वर्ष पुस्तिका 2017-18 को नदी आकडे निदेशालय, केन्द्रीय जल आयोग, नई दिल्ली के पत्रांक 4/50/2005/RD/WYBF/3329-95 दिनांक 19.11.2005 द्वारा जारी किये गए मार्ग-निर्देशन के अनुसार संकलित किया गया है | इस पुस्तिका के आकड़ों को SWDES व eSWIS सॉफ्टवेर में संकलित व परिष्कृत कर विभिन्न तकनीकी माध्यमों से प्रदर्शित किया गया हैं |

इस पुस्तक की समस्त जानकारी के एकत्रण संकलन, विश्लेषण एवं सम्पादन से सम्बद्ध केन्द्रीय जल आयोग के अधिकारियों एवं कर्मचारियों का अथक परिश्रम एवं समर्पण सराहनीय है | मैं केंद्र एवं राज्य सरकार के विभिन्न विभाग, केन्द्रीय प्रदूषण नियंत्रण बोर्ड, नर्मदा नियंत्रण प्राधिकरण, जनगणना विभाग, नर्मदा घाटी विकास प्राधिकरण, नर्मदा जल-विद्युत् विकास निगम लिमिटेड तथा पर्यावरण प्रदूषण नियंत्रण संगठन आदि के साथ उन सभी का आभारी हूँ जिन्होंने इस पुस्तक से सम्बंधित विविध जानकारियाँ उपलब्ध करने तथा सहयोग एवं सहायता दी हैं |

22/03/19

मार्च 2019

(प्रदीप कुमार ठाकुर)
अधीक्षण अभियंता

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LIST OF SYMBOLS

CWC	:	Central Water Commission
IMD	:	India Meteorological Department
WRD of GoMP	:	Water Resources Department of Government of Madhya Pradesh
NCA	:	Narmada Control Authority
MCM	:	Million Cubic Metres
Cumec	:	Cubic Metre Per Second
Ha	:	Hectare
ha^2	:	Square Hectare
ha^3	:	Cubic Hectare (Million cubic metres)
M.S.L.	:	Mean sea level
F	:	Float Observation
FF	:	Flood forecasting
G	:	Gauge
GTS	:	Great Trigonometrical Survey
Hrs	:	Hours
IWYB	:	Integrated Water Year Book
Hm^3	:	Hectometre Cube = Million Cubic Metre
Mm	:	Millimetre
M	:	Metre
m^3/s	:	Cubic Metre Per Second
^{o}	:	Degree (00^o)
’	:	Minute (00’)
”	:	Second (00”)
80 key	:	80 key Hydrological Station Scheme
67 key	:	67 key Hydrological Station Scheme

1 Introduction

1.1 General

Central Water Commission (CWC) is conducting hydrological observations on major river basins under National Network which was initially started under 80 Key Stations, 163 Key Stations and Flood Forecasting schemes. Presently hydrological sites are operated under Plan & Non Plan schemes named "*Development of Water Resources Information Systems*" and "*Flood Forecasting*" of Central Water Commission. This Water Year Book presents data of 19 hydrological observation stations for the year 2017-18in Narmada basin. The data of 19 hydrological observation sites, which is presented in this publication, have been collected by Narmada Division, Bhopal & Tapi Division, Surat of CWC. Out of 19 sites in Narmada Basin, 02 sites viz., Orsang at Chandwada and Narmada at Garudeshwar are being maintained by Tapi Division, Surat; 01 site named Narmada at Bijora is being maintained by WRD, Govt of Madhya Pradesh; while the remaining 16 sites are being maintained by Narmada Division, Bhopal. Jurisdiction of Narmada Division is as given in Figure 2-3**.**

State Government Sites in Madhya Pradesh are operated by the Director (Hydromet), WRD, Bhopal. The data of one site i.e. Narmada at Bijora have been obtained from the State Government and included in the Water Year Book.

The classification and scheme wise distribution of hydrological observation stations is presented in Table 1-1andTable 2-1respectively.

Table 1-1 Classification of Hydrological Observation Stations

S. No.	Site	River	Basin	Code	Type
1.	Narmada at Dindori	Narmada	Narmada	010215001	GDWQ
2.	Narmada at Manot	Narmada	Narmada	010215002	GDSWQ
3.	Burhner at Mohgaon	Burhner	Narmada	010215004	GDSWQ
4.	Banjar at Bamni	Banjar	Narmada	--	GDSWQ
5.	Hiran at Patan	Hiran	Narmada	010215009	GDWQ
6.	Sher at Belkheri	Sher	Narmada	010215010	GDWQ
7.	Narmada at Barmanghat	Narmada	Narmada	010215011	GDSWQ
8.	Shakkar at Gadarwara	Shakkar	Narmada	010215012	GDSWQ
9.	Narmada at Sandia	Narmada	Narmada	010215013	GDSWQ
10.	Narmada at Hoshangabad	Narmada	Narmada	010215019	GDSWQ
11.	Ganjal at Chhidgaon	Ganjal	Narmada	010215020	GDWQ
12.	Narmada at Handia	Narmada	Narmada	010215022	GDSWQ
13.	Kundi at Kogaon	Kundi	Narmada	010215025	GDWQ

S. No.	Site	River	Basin	Code	Type
14.	Narmada at Mandleshwar	Narmada	Narmada	010215026	GDSWQ
15.	Uri at Dhulsar	Uri	Narmada	--	GDWQ
16.	Goi at Pati	Goi	Narmada	--	GDWQ
17.	Narmada at Garudeshwar	Narmada	Narmada	010215030	GDSWQ
18.	Orsang at Chandwada	Orsang	Narmada	010215032	GDSWQ
19.	Narmada at Bijora	Narmada	Narmada	--	GD

Table 1-2 Schemewise Distribution of Sites

Sl No.	Name of Site	Station Code No.	Scheme
I	**2711 Flood Forecasting**		
1.	Narmada at Dindori	010215001	Plan
2.	Narmada at Manot	010215002	Plan
3.	Burhner at Mohgaon	010215004	Plan
4.	Banjar at Bamni	--	Plan
II	**2701 –DWRIS-Data Collection**		
5.	Orsang at Chandwada	010215032	Non Plan
6.	Hiran at Patan	010215009	Non Plan
7.	Sher at Belkheri	010215010	Non Plan
8.	Narmada at Barmanghat	010215011	Non Plan
9.	Shakkar at Gadarwara	010215012	Non Plan
10.	Narmada at Sandia	010215013	Non Plan
11.	Narmada at Hoshangabad	010215019	Non Plan
12.	Ganjal at Chhidgaon	010215020	Non Plan
13.	Narmada at Handia	010215022	Non Plan
14.	Kundi at Kogaon	010215025	Non Plan
15.	Narmada at Mandleshwar	010215026	Non Plan
16.	Narmada at Garudeshwar	010215030	Non Plan
III	**NCA Deposit Work**		
17.	Uri at Dhulsar (Closed on dated 31.03.2017)	--	NCA
18.	Goi at Pati (Closed on dated 31.03.2017)	--	NCA
IV	**Govt. of Madhya Pradesh**		
19.	Narmada at Bijora	..	State Govt. Site

The river basin description is given in Section-2

1.2 Organisation of the Water Year Book

The WaterYear Book gives detailed description of river basin, its river system, climatic characteristics, geology along with methodology of stream flow data collection, its availability and hydrological data observed at various stations during the year. The station wise data sheet presents various parameters like monthly flow summary, 10-daily as well as monthly mean flows besides peak flow results. The analysed data has also been presented in form of charts and maps.

The Year Book runs under four sections as given below.

Section-1: Introduction

Section-2: Basin Description

Section-3: Stream Flow Data

Section-4: Hydrological Data

2 Narmada Basin Description

2.1 Geographical Description of Narmada Basin

The Narmada is the largest West flowing and fifth largest river of India. It drains a large area in Madhya Pradesh besides some area in the states of Maharashtra and Gujarat. The Narmada basin lies between East Longitudes 72^{o} 32' to 81^{o} 45' and North Latitudes 21^{o} 20' to 23^{o} 45'. It flows through Deccan trap in between Vindhya and Satpura ranges of hills before falling into the Gulf of Cambay in the Arabian Sea.

The Narmada drains an area of 98796 sq km. out of which nearly 87% lies in Madhya Pradesh. The statewise distribution of drainage area is shown in **Table 2-1**.

Table 2-1 Statewise Distribution of Drainage Area

Sl. No.	Name of State	Drainage Area (sq km)	Percentage
1.	Madhya Pradesh	85859	86.9
2.	Maharashtra	1538	1.5
3.	Gujarat	11399	11.6
	Total	**98796**	**100**

The details of CWC hydrological observation stations are given in Table 2-2. Further, there are 31 gauge/gauge and discharge sites being maintained by State Government of Madhya Pradesh and 12 gauge/gauge and discharge sites being maintained by State Government of Gujarat in Narmada basin. The details of the sites maintained by the State Government of Madhya Pradesh are given in Table 2-3. The line diagram of Narmada basin showing the observation stations is given in Figure 2-1.

Table 2-2 Central Water Commission, Govt. of MP and NCA Sites

Sl No.	Name of Site	Station Code No.	Scheme
1.	Narmada at Dindori	010215001	2711 Flood Forecasting (Plan)
2.	Narmada at Manot	010215002	2711 Flood Forecasting (Plan)
3.	Burhner at Mohgaon	010215004	2711 Flood Forecasting (Plan)
4.	Banjar at Bamni	--	2711 Flood Forecasting (Plan)
5.	Narmada at Bijora	--	Govt. of MP
6.	Hiran at Patan	010215009	2701 DWRIS Data Collection (Non Plan)

7.	Sher at Belkheri	010215010	2701 DWRIS Data Collection (Non Plan)
8.	Narmada at Barmanghat	010215011	2701 DWRIS Data Collection (Non Plan)
9.	Shakkar at Gadarwara	010215012	2701 DWRIS Data Collection (Non Plan)
10.	Narmada at Sandia	010215013	2701 DWRIS Data Collection (Non Plan)
11.	Narmada at Hoshangabad	010215019	2701 DWRIS Data Collection (Non Plan)
12.	Ganjal at Chhidgaon	010215020	2701 DWRIS Data Collection (Non Plan)
13.	Narmada at Handia	010215022	2701 DWRIS Data Collection (Non Plan)
14.	Kundi at Kogaon	010215025	2701 DWRIS Data Collection (Non Plan)
15.	Narmada at Mandleshwar	010215026	2701 DWRIS Data Collection (Non Plan)
16.	Uri at Dhulasr	--	Deposit Work NCA
17.	Goi at Pati	--	Deposit Work NCA
18.	Narmada at Garudeshwar	010215030	2701 DWRIS Data Collection (Non Plan)
19.	Orsang at Chandwada	010215032	2701 DWRIS Data Collection (Non Plan)

Table 2-3 State Government Sites

Sl. No.	StationName	Type	Sl. No.	StationName	Type
1	Narmada at Mortakka	GDS	17	Beda at Lower Beda	GD
2	Narmada at Sankalghat	GD	18	Undri at Gadigatter	GD
3	Narmada at Jansighat	GD	19	Jamner at Sandalpur	GD
4	Narmada at Jamtara	GD	20	Ganjal at Chhidgaon	G
5	Narmada at Bargi	GD	21	Beda at Upper Beda	GD
6	Narmada at Mandla	GD	22	Kolar at Satrana	GD
7	Narmada at Manot	GD	23	Kolar at Lawakheda	G
8	Narmada at Bijora	GD	24	Barna at Bareli	GD
9	Hathni at Tikola	G	25	Tawa at Bagratawa	G
10	Hathni at Hatnia	GD	26	Tendoni at Maheshwar	GD
11	Sukari at Sukkad	G	27	Banjar at Hirdayanagar	G
12	Deb at Lingwa	G	28	Pariyat at Tikheria	G

Sl. No.	StationName	Type
13	Man at Ajandiman	GD
14	Kundia at Badi	G
15	Kundi at Dejla Dewda	G
16	Man at Man Project	GD

Sl. No.	StationName	Type
29	Banjar at Bamni Banjar	G
30	Burhner at Parastala	G
31	Kharmer at Shakkar	G

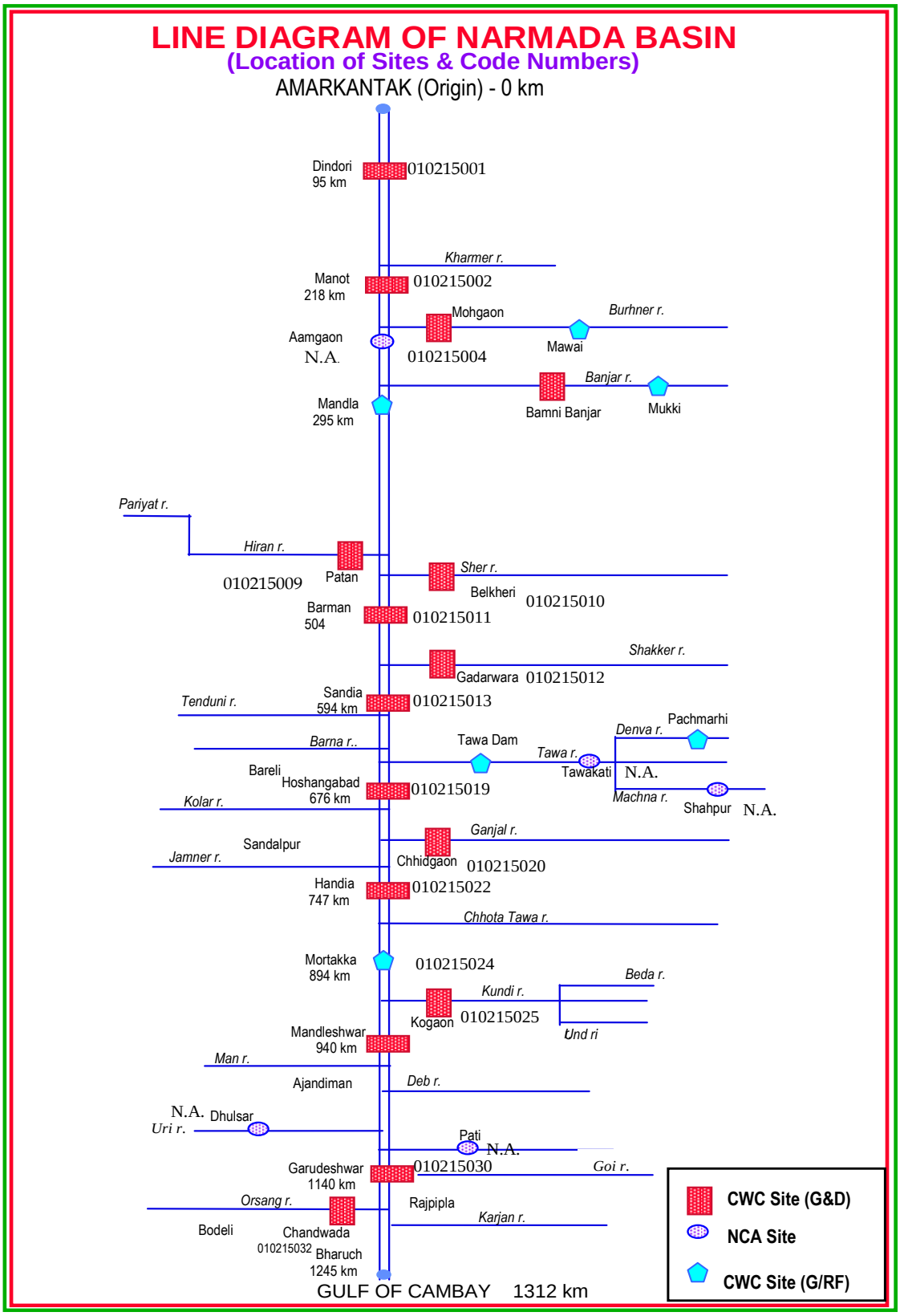


Figure 2-1 Line Diagram of Narmada Basin (Location of Sites and Code Numbers)

2.2 Description of the River System

The Narmada originates from a Kund (spring) at an elevation of 1057m at Amarkantak in the Maikal hill in Shahdol district of Madhya Pradesh and flows through Madhya Pradesh, Maharashtra and Gujarat between Vindhya and Satpura hill ranges before falling into the Gulf of Cambay in the Arabian Sea, about 10 km north of Bharuch, Gujarat. The total length of this west flowing river from its origin to its outfall into the Arabian Sea is 1312 km. For the first 1079 km it flows in Madhya Pradesh and thereafter forms the common boundary between Madhya Pradesh and Maharashtra for 35 km, and Maharashtra and Gujarat for 39 km. In GujaratState it stretches for 159 km.

There are 41 important tributaries to the Narmada river. Significant among them are Burhner, Banjar, Hiran, Tawa, Chhota Tawa, Orsang and Kundi which are major tributaries having catchment area more than 3500 sq km. The remaining tributaries are having catchment area ranging from 500 to 2500 sq km.The catchment area, length and elevation of the origin of the important tributaries are indicated in Table 2-4.

Table 2-4 Important Tributaries

Sl. No	Tributary	Bank	Elevation of Origin above MSL (m)	Catchment Area (km^2)	Total length from origin (km)
1	Kharmer	Left	-	557	64.0
2	Silgi	Right	-	531	65.0
3	Burhner	Left	900	4228	177.0
4	Banjar	Left	600	3282	183.0
5	Balai	Right	-	531	46.0
6	Temur	Left	550	892	54.0
7	Gaur	Right	690	1107	79.5
8	Soner	Left	-	581	51.0
9	Hiran	Right	500	4795	188.0
10	Sher	Left	650	2903	129.0
11	Biranjo	Right	-	1172	62.0
12	Shakkar	Left	900	2294	161.0
13	Dudhi	Left	900	1542	129.0
14	Sukhri	Left	-	609	39.0
15	Tendoni	Right	500	1633	177.0
16	Barna	Right	450	1789	105.0
17	Tawa	Left	600	6338	172.0
18	Hather	Left	-	645	37.5
19	Kolar	Right	600	1348	101.0
20	Ganjal	Left	700	1931	89.0
21	Sip	Right	-	879	45.0

Sl. No	Tributary	Bank	Elevation of Origin above MSL (m)	Catchment Area (km^2)	Total length from origin (km)
22	Jamner	Right	470	671	30.0
23	Chankesher	Right	600	1249	30.0
24	Anjal	Left	-	1203	62.5
25	Machak	Left	550	1112	87.5
26	Chhota Tawa	Left	400	5055	169.0
27	Khari	Right	-	754	41.0
28	Kenar	Right	-	1581	62.5
29	Kaveri	Left	-	954	32.5
30	Choral	Right	-	601	55.0
31	Kharkia	Left	-	1099	24.0
32	Kundi	Left	900	3973	120.0
33	Karan	Right	-	858	45.0
34	Board	Left	-	866	62.5
35	Man	Right	550	1529	89.0
36	Deb	Left	350	969	82.5
37	Uri	Right	-	2004	74.0
38	Goi	Left	800	1892	129.0
39	Hatni	Right	350	1944	30.0
40	Orsang	Right	300	3946	101.0
41	Karjan	Left	200	1490	93.0

2.3 Climate Characteristics

2.3.1 Temperature

Temperature of Narmada Basin varies like any other part of Central India. The difference between the maximum & minimum temperature, in any part of the basin, is quite pronounced. The temperature is maximum in the month of May and minimum in the month of January. In general, the upper NarmadaBasin records lower temperature as compared to middle basin. In lower section of the basin, the influence of the sea is prominent, and temperature though lower than the middle basin, is still higher than the upper reaches of NarmadaRiver. The temperature profile in the basin is given in the Figure 2-4 and Table 2-5.

Table 2-5 Temperature Data of Narmada Basin

Month/ Location	Mean Monthly Maximum Temperature (ºC)						Mean Monthly Minimum Temperature (ºC)					
	HO	PAC	KHN	JA	PEN	VA	HO	PAC	KHN	JA	PEN	VA
January	26.6	22.4	29.3	26.1	24	29.6	12.7	8.7	12.0	9.0	10.9	12.7
February	29.8	24.7	31.9	28.9	26.5	32.5	14.3	10.4	13.6	11.4	12.5	14.2
March	34.9	28.9	36.4	34.0	31.5	36.5	18.6	14.8	18.1	15.5	17.6	18.5
April	39.3	33.4	40.2	38.5	36	39.7	23.5	20.1	23.9	20.5	22.3	22.9
May	42.0	36.0	41.9	41.9	39.3	40.6	27.6	24.3	27.9	25.9	26.1	26.8
June	37.6	31.4	37.5	37.6	35.1	36.7	26.6	22.5	26.2	26.4	25.0	27.0
July	30.2	23.3	30.9	30.3	28.7	32.1	24.0	19.9	23.8	23.9	22.8	25.6
August	29.2	23.8	29.9	29.5	28.3	31.1	23.5	19.6	23.2	23.6	22.5	24.9
September	30.7	25.2	31	30.8	28.9	32.7	23.2	19.1	22.7	23.1	22	24.4
October	32.1	26.2	33.4	31.4	28.5	34.9	19.5	14.8	18.9	18.4	18.4	21.4
November	29.3	24.1	31.2	28.9	26.3	33.3	14.5	9.6	13.5	11.7	13.4	16.4
December	27.1	22.8	29.6	26.9	24.2	31	12.3	7.5	11.2	9	10.1	13.5
Annual Mean	32.4	26.9	33.6	32.1	29.8	34.3	20.0	15.9	19.6	18.3	18.6	20.7

HO: Hoshangabad

PAC: Pachmarhi

KHN: Khandwa

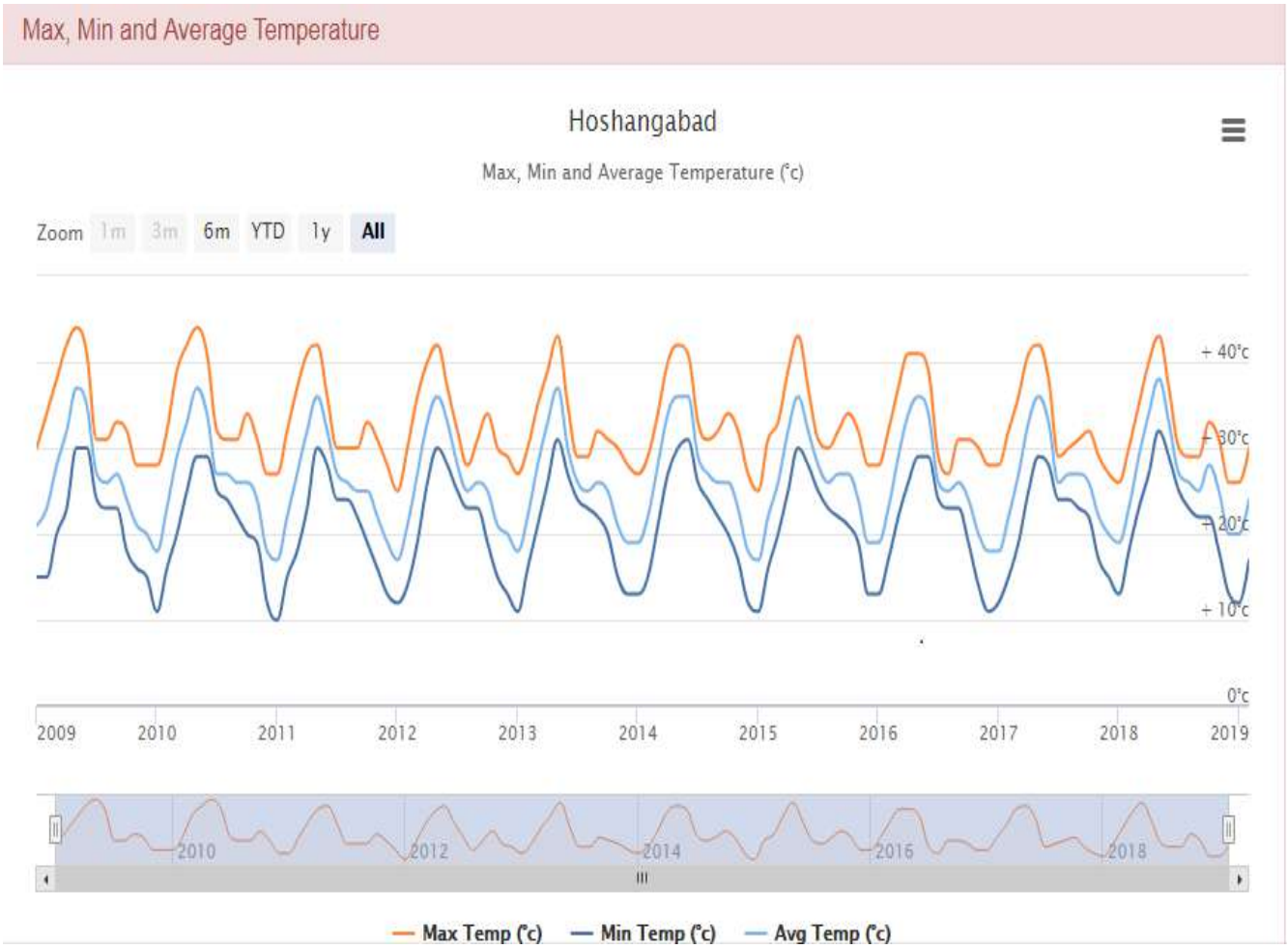
JA: Jabalpur

PEN: Pendra Road

VA: Vadodara

GRAPH:

HOSANGABAD


Max, Min and Average Temperature
Hoshangabad
Max, Min and Average Temperature (°c)
Zoom 1m 3m 6m YTD 1y All
+ 40°c
+ 30°c
+ 20°c
+ 10°c
0°c
2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019
2010 2012 2014 2016 2018
Max Temp (°c) Min Temp (°c) Avg Temp (°c)

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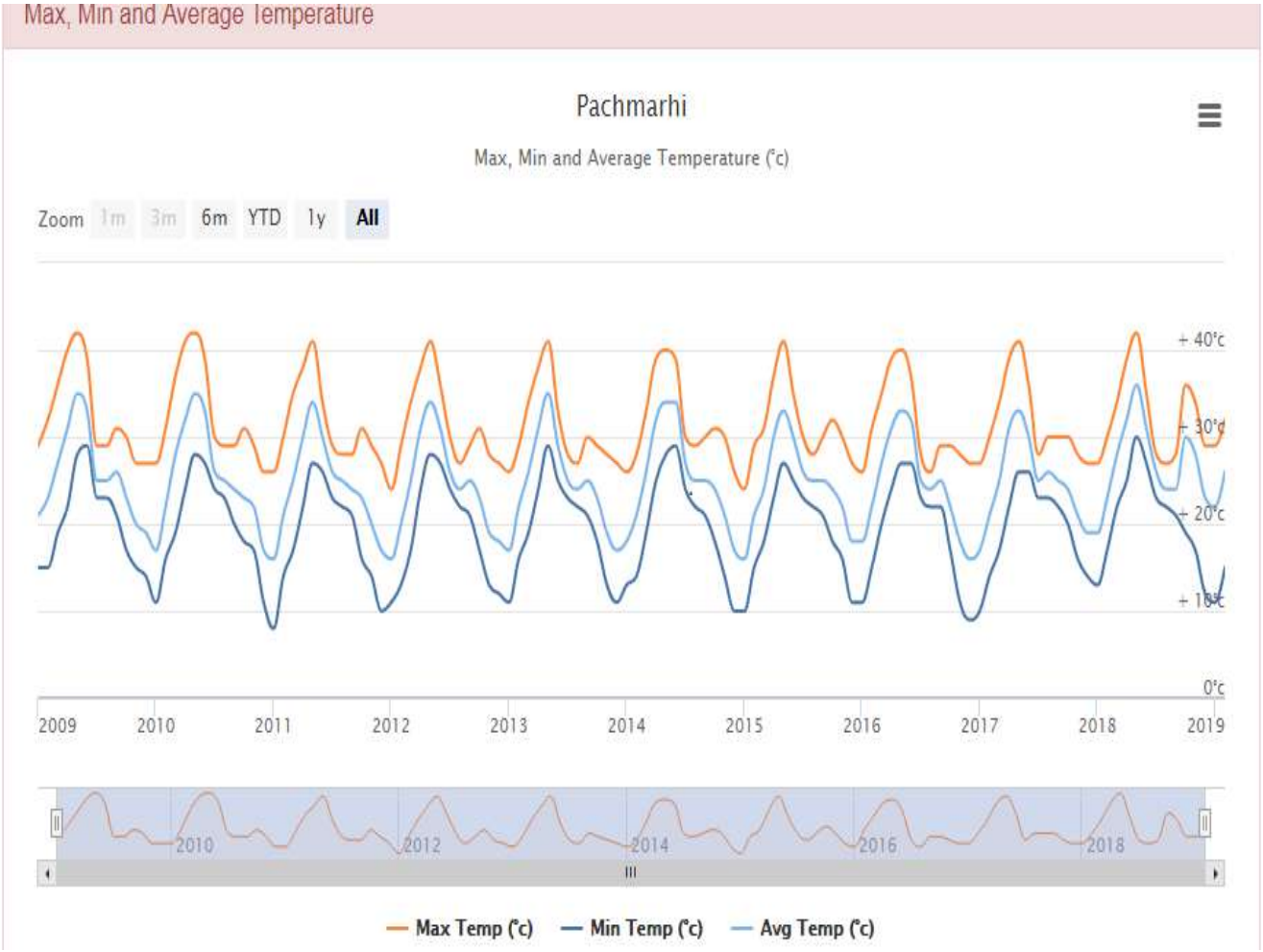
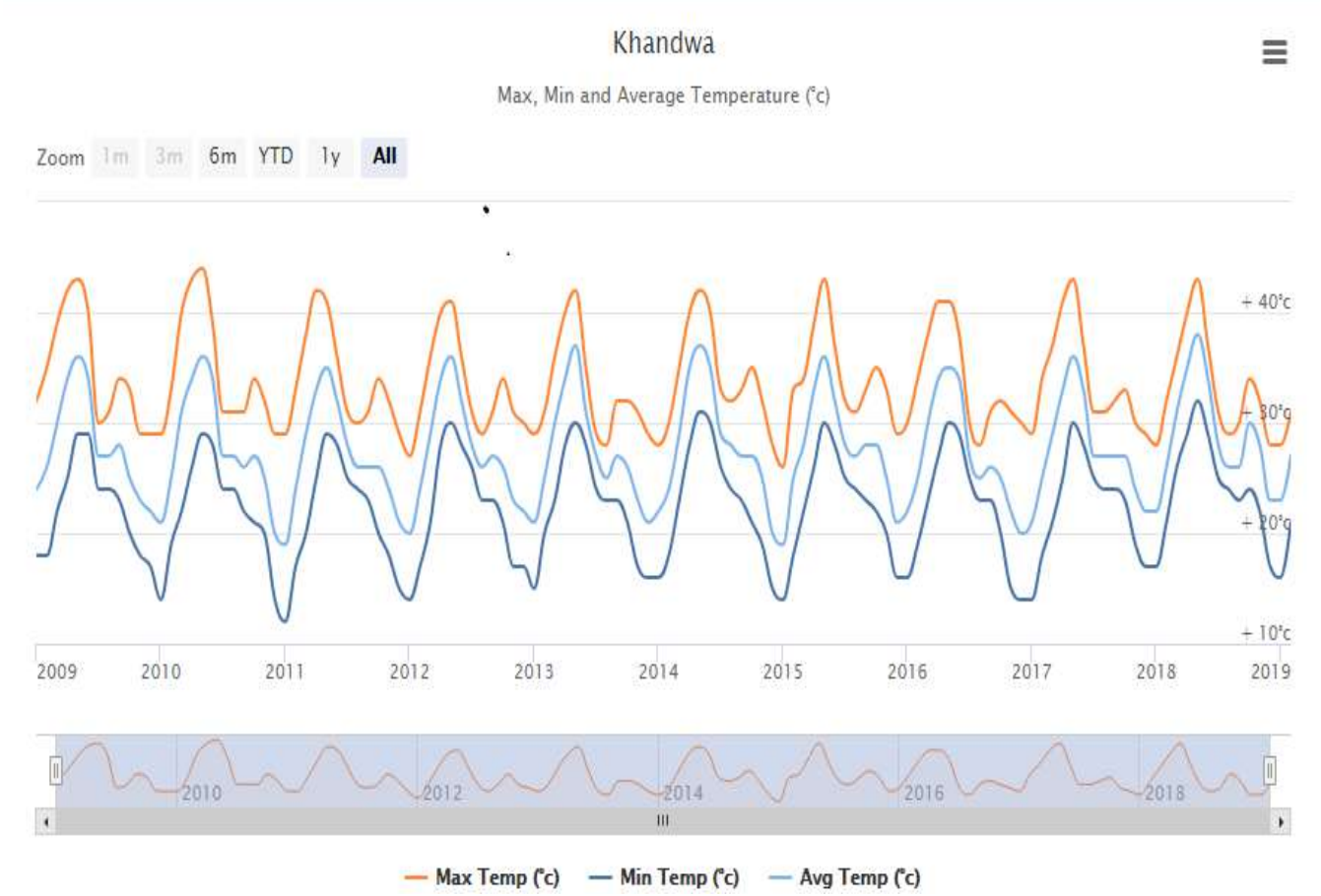
PANCHMARHI

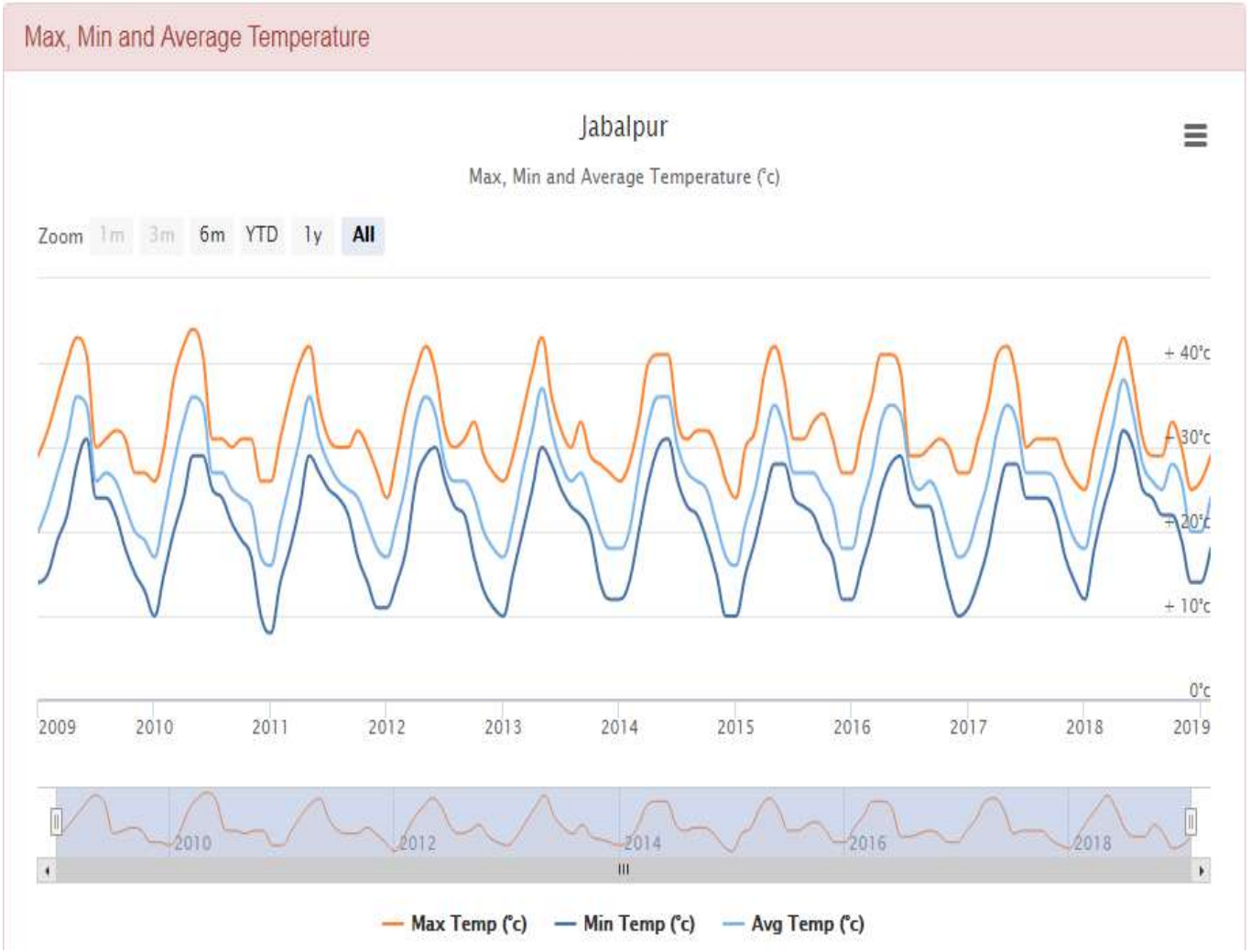

Max, Min and Average Temperature
Pachmarhi
Max, Min and Average Temperature (°c)
Zoom 1m 3m 6m YTD 1y All
+ 40°c
+ 30°c
+ 20°c
+ 10°c
0°c
2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019
2010 2012 2014 2016 2018
Max Temp (°c)
Min Temp (°c)
Avg Temp (°c)

KHANDWA

Max, Min and Average Temperature

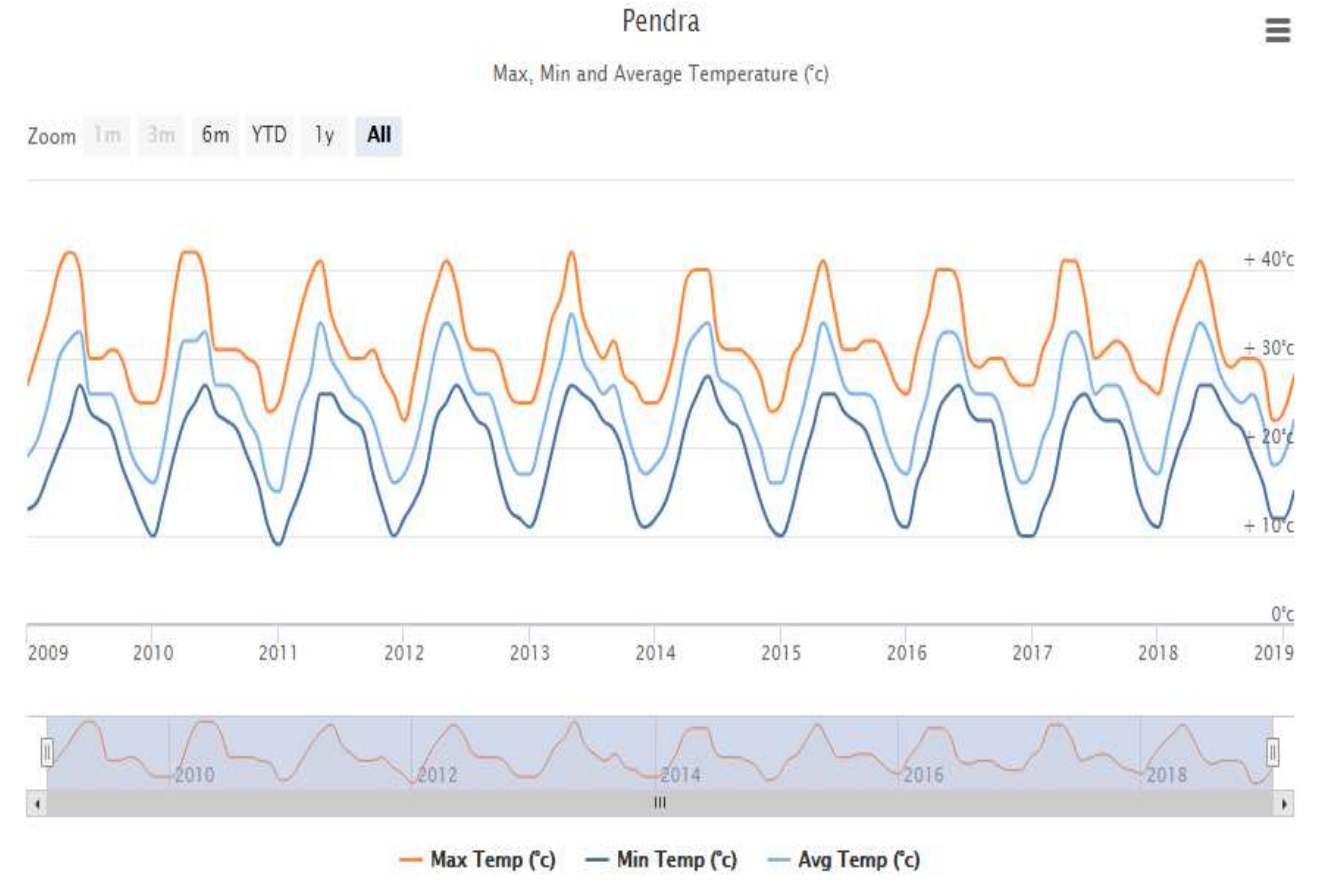


JABALPUR

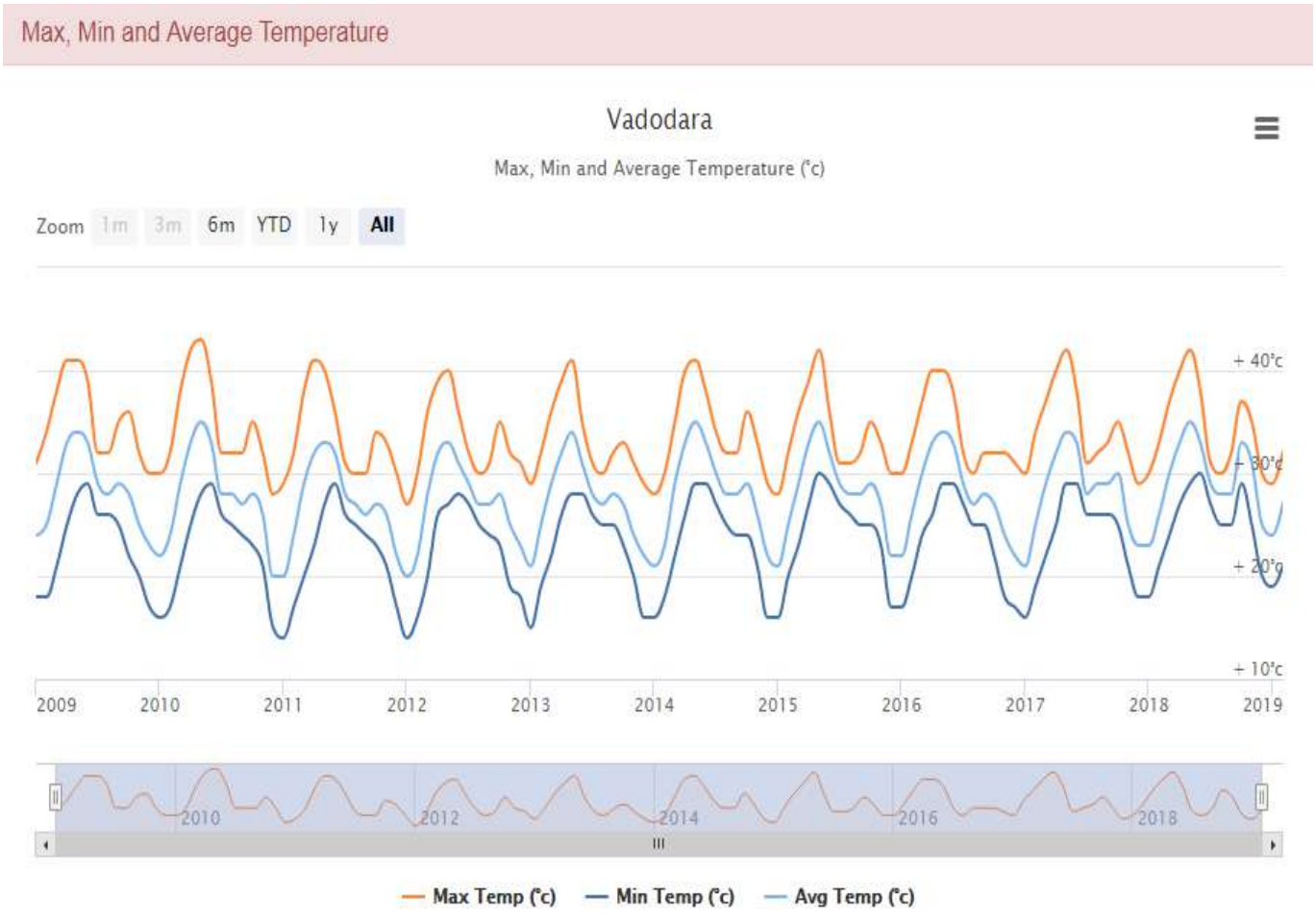

Max, Min and Average Temperature
Jabalpur
Max, Min and Average Temperature (°c)
Zoom 1m 3m 6m YTD 1y All
+ 40°c
+ 30°c
+ 20°c
+ 10°c
0°c
2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019
2010 2012 2014 2016 2018
Max Temp (°c)
Min Temp (°c)
Avg Temp (°c)

PENDRA RAOD

Max, Min and Average Temperature



VADODARA



2.3.2 Rainfall

The Inter-departmental Committee on Soil Conservation and Afforestation of Sardar Sarovar & Narmada Sagar projects constituted by the Ministry of Agriculture and Rural Development, Government of India had compiled annual & seasonal rain fall data of the Narmada basin between 1901-1950 which is presented in Table 2-6.

Above data suggests that a major portion of the precipitation in the basin takes place during the southwest monsoon, and accounts for about 85% to 95% of the total precipitation. The post monsoon accounts for about 9% of the precipitation whereas the winter and the pre-monsoon, together account for about a maximum of 10% of the total precipitation.

Table 2-6 Rainfall in Districts of Narmada Basin (Average for the period 1901-1950)

Sl. No.	District	Seasonal Average Rainfall(mm)				Total
		Winter Monsoon (Jan-Feb)	Pre-Monsoon (March-May)	South-West Monsoon (June-Sept)	Post Monsoon (Oct-Dec)	Annual Average Rainfall
1	Shahdol	76 (5.4)	58 (4.1)	1184 (84.7)	79 (5.6)	1397
2	Mandla	53 (3.4)	58 (3.7)	1163 (86.8)	86 (5.5)	1570
3	Balaghat	47 (2.9)	47 (2.9)	1447 (89.1)	82 (5.0)	1623
4	Seoni	57 (4.1)	60 (4.3)	1179 (85.1)	89 (6.4)	1385
5	Jabalpur	50 (3.9)	16 (1.2)	1113 (88.8)	67 (5.2)	1274
6	Narsinghpur	33 (2.5)	30 (2.3)	1171 (90.0)	67 (5.1)	1301
7	Sagar	38 (3.1)	24 (1.9)	1113 (90.1)	60 (4.8)	1235
8	Damoh	34 (2.8)	26 (2.1)	1103 (85.6)	61 (5.0)	1224
9	Chhindwara	48 (3.6)	52 (3.9)	11333 (85.6)	91 (6.9)	1324
10	Hoshangabad	23 (1.8)	20 (1.5)	1188 (91.7)	64 (4.9)	1295
11	Betul	35 (3.2)	37 (3.4)	925(85.3)	87 (8.0)	1084
12	Raisen	33 (2.5)	20 (1.5)	1218 (91.6)	58 (4.4)	1330
13	Sehore	19 (1.5)	17 (1.4)	1153 (92.7)	55 (4.4)	1244
14	Khandwa	14 (1.6)	15 (1.7)	786 (89.3)	65 (7.4)	880
15	Khargone	4 (0.5)	13 (1.6)	753 (90.5)	62 (7.4)	832
16	Dewas	13 (1.2)	18 (1.7)	995 (91.9)	57 (5.3)	1083
17	Indore	8 (0.8)	17 (1.7)	887 (91.0)	63 (6.5)	975
18	Dhar	5 (0.6)	12 (1.4)	763 (91.6)	53 (6.4)	833
19	Jhabua	6 (0.7)	12 (1.4)	773 (93.3)	37 (4.5)	825
20	Dhule	8 (1.2)	12 (1.8)	596 (88.4)	58 (8.6)	674
21	Vadodara	5 (0.5)	9 (0.9)	917 (94.6)	38 (3.9)	969
22	Bharuch	5 (0.5)	9 (0.9)	892 (93.9)	44 (4.6)	950

Sl. No.	District	Seasonal Average Rainfall(mm)				Total
		Winter Monsoon (Jan-Feb)	Pre-Monsoon (March-May)	South-West Monsoon (June-Sept)	Post Monsoon (Oct-Dec)	Annual Average Rainfall
	Range	5-76	9-60	596-1363	37-89	674 -1623
		(0.5-5.4)	(0.9-4.3)	(84.7-94.6)	(3.9-8.6)	

Note: Figures in brackets are percentage w.r.t. Annual Rainfall

Source: Basin Sub-basin Inventory of Water Pollution- The Narmada Basin, CPCB, Delhi March 1994

The recent rainfall data for five years from 2006-10 is shown in the table 2.7

Table2-7 Five Year Average Rainfall for the Districts of the Basin (2006-10)

Sl. No.	District	Seasonal Average Rainfall(mm)				Total
		Winter Monsoon (Jan-Feb)	Pre-Monsoon (March-May)	South-West Monsoon (June-Sept)	Post Monsoon (Oct-Dec)	Annual Average Rainfall
1	Shahdol	17	26	858	16	916
2	Mandla	6	16	1192	40	1253
3	Balaghat	10	52	1202	52	1315
4	Seoni	4	36	1007	38	1085
5	Jabalpur	15	31	1058	46	1151
6	Narsingpur	9	31	927	22	990
7	Sagar	7	31	848	57	942
8	Damoh	10	20	890	35	955
9	Chindwara	3	37	922	60	1022
10	Hoshangabad	7	37	1185	66	1295
11	Betul	7	37	1185	66	1295
12	Raisen	4	8	900	42	954
13	Sehore	6	30	872	54	964
14	Khandwa	1	17	730	40	788
15	Khargone	1	11	744	37	792
16	Dewas	0	0	4112	152	4264
17	Indore	11	122	4286	370	4789
18	Dhar	0	5	851	42	897
19	Jhabua	0	3	883	30	915
20	Dhule	0	2	597	66	665
21	Vadodara	0	0	1009	17	1026
22	Bharuch	0	1	780	18	799

Source: Website of Indian Meteorological Department (District rainfall for five years -Hydromet Division)

From the above Table 2-6 and Table2-7 it can be observed that the patternof the precipitation in the basin is almost similar to the past pattern, major portion of the rainfall being taking place during the southwest monsoon.The post monsoon and pre-monsoon account for small parts of the precipitation whereas the winter monsoon has still lesser or no contribution towards the total precipitation. The average rainfall in the basinduring the last five years has decreased at some places (the maximum decrease being about 35% for Shahdol district) while it has increased at other places (the maximum increase being about 391% for Indore district) as compared to the average past rainfall for the period of 1901-1950.This change in average rainfall may be due to climate change and human activities (like land use change).

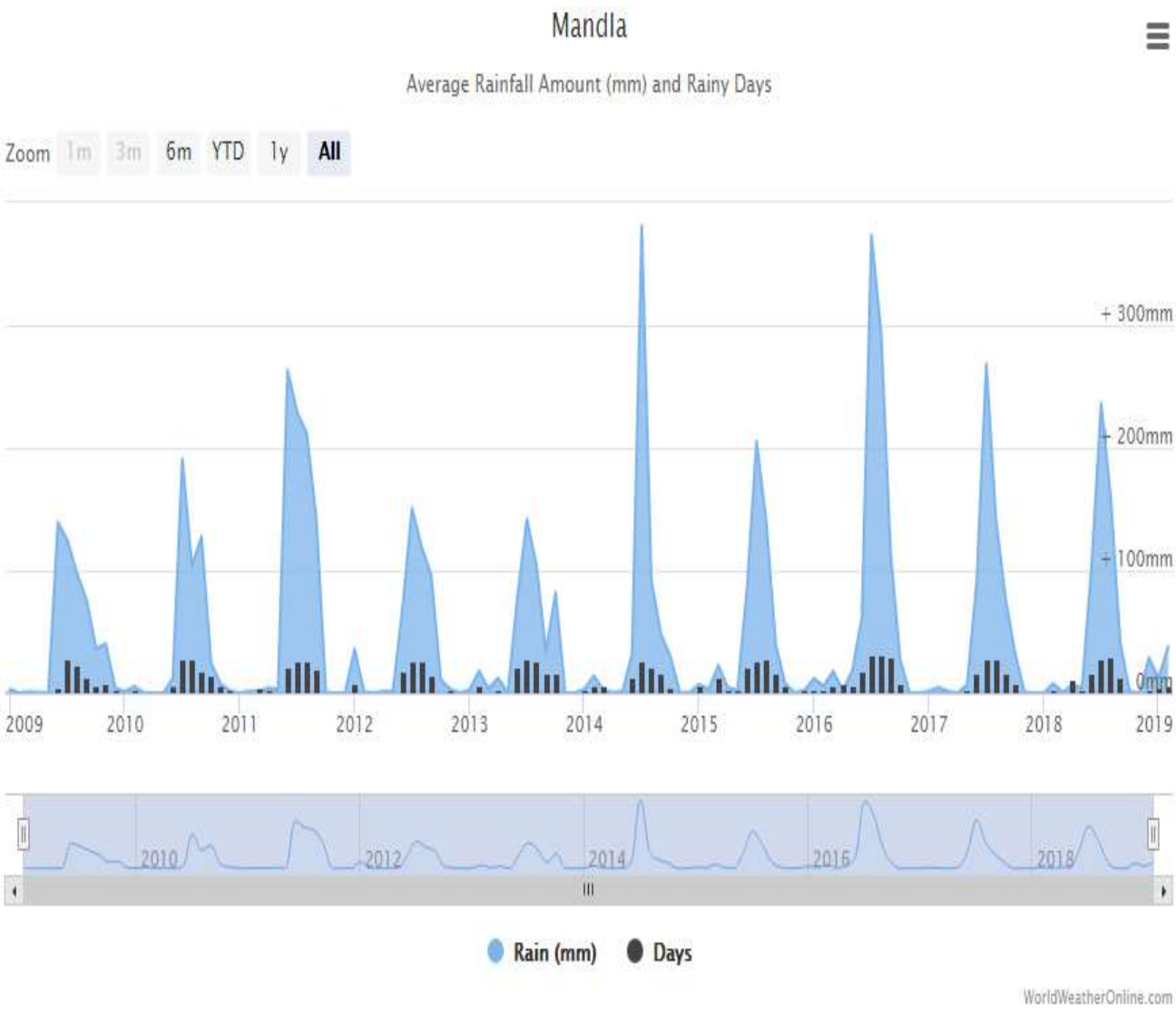
Figure 2-5 gives the isohyets map of the Narmada Basin. The rainfall is higher in the upper and lower basin, but marginally less in the lower middle and middle basin. The general pattern of the basin is that the rainfall increases from west to east.

From the data of fifty years on intensity of rainfall during a 24 hours period as compiled by the Central Water Commission, it can be concluded that the most intense rain occurs in the southern section of the upper Narmada basin, where 24-hour rainfall is about 360 mm. The least intense rainfall is between Jhabua & Dhar where the 24 hours rainfall is less 260 mm. Details are shown in Figure 2-6**.**

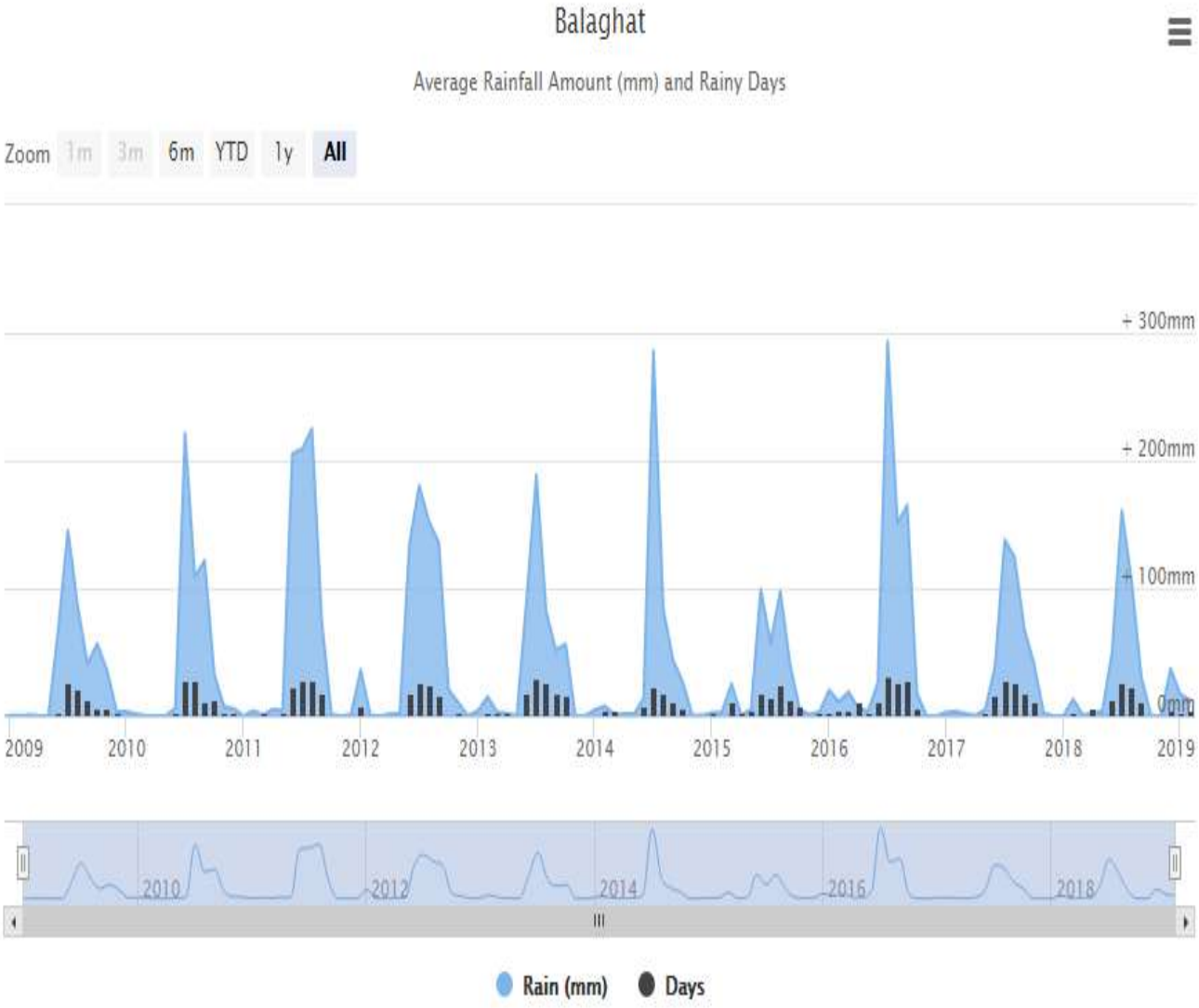
Graph of Average Rainfall

Average Rainfall of Shahdol

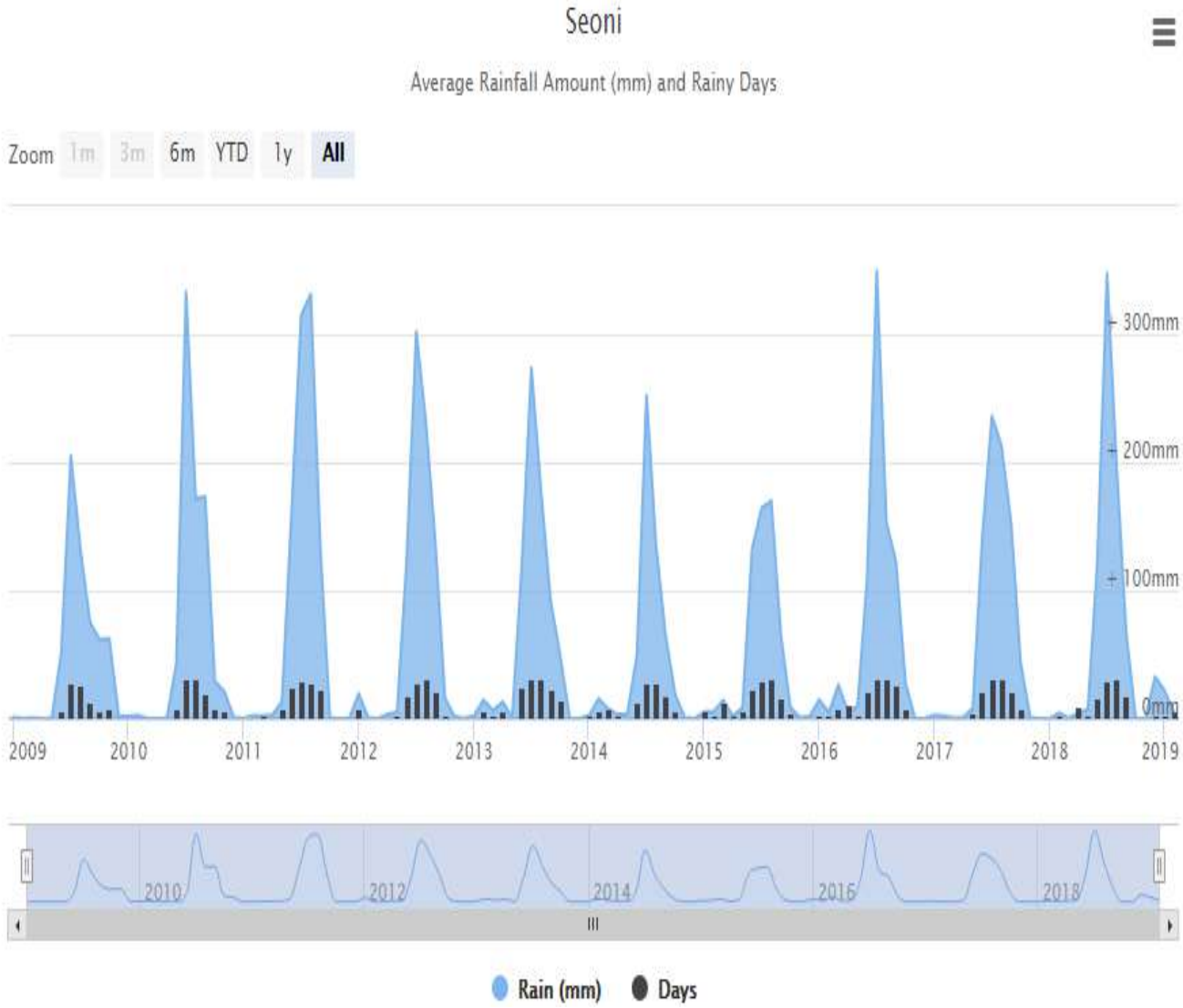
Average Rianfall of Mandla



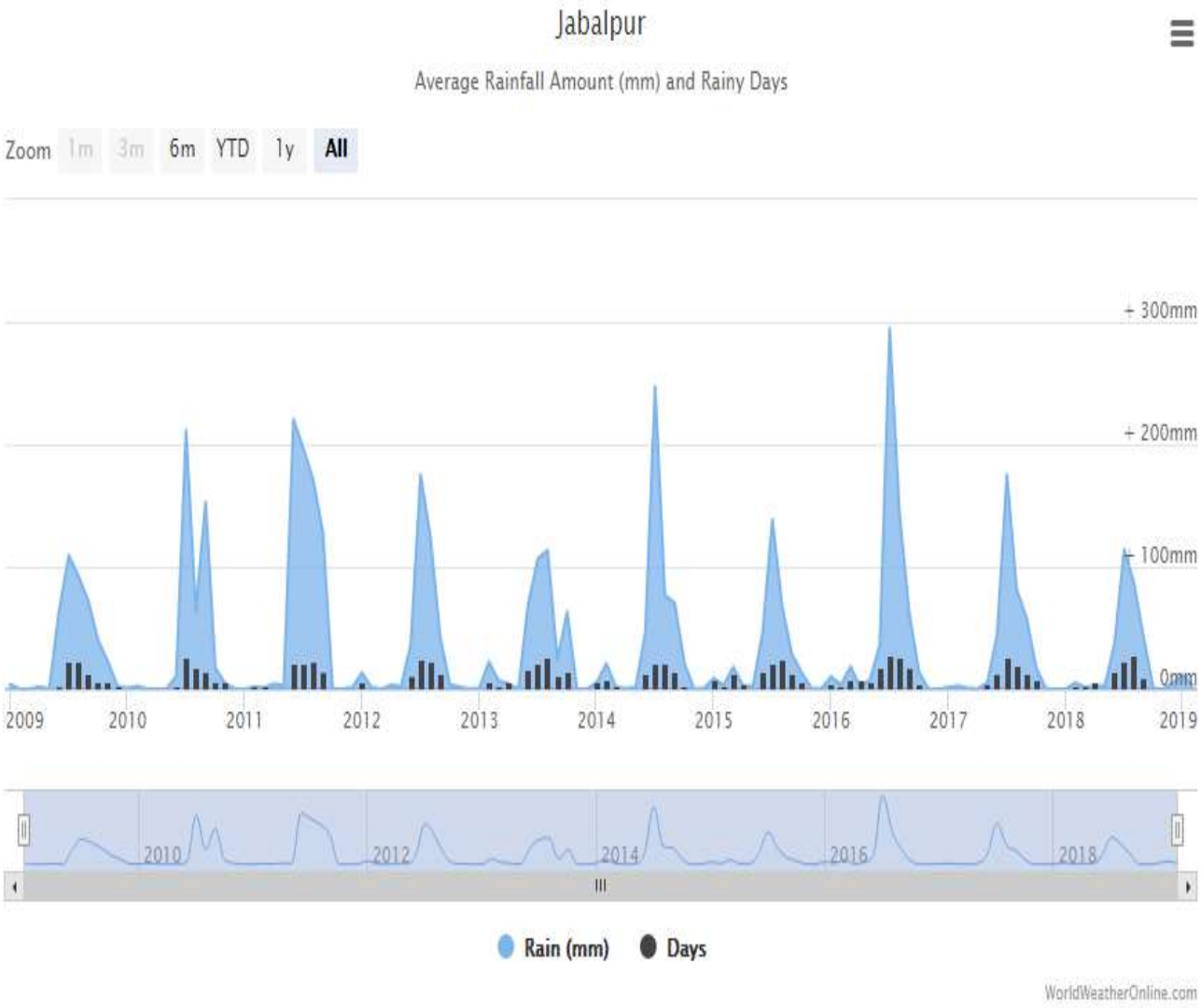
Average Rainfall of Balaghat



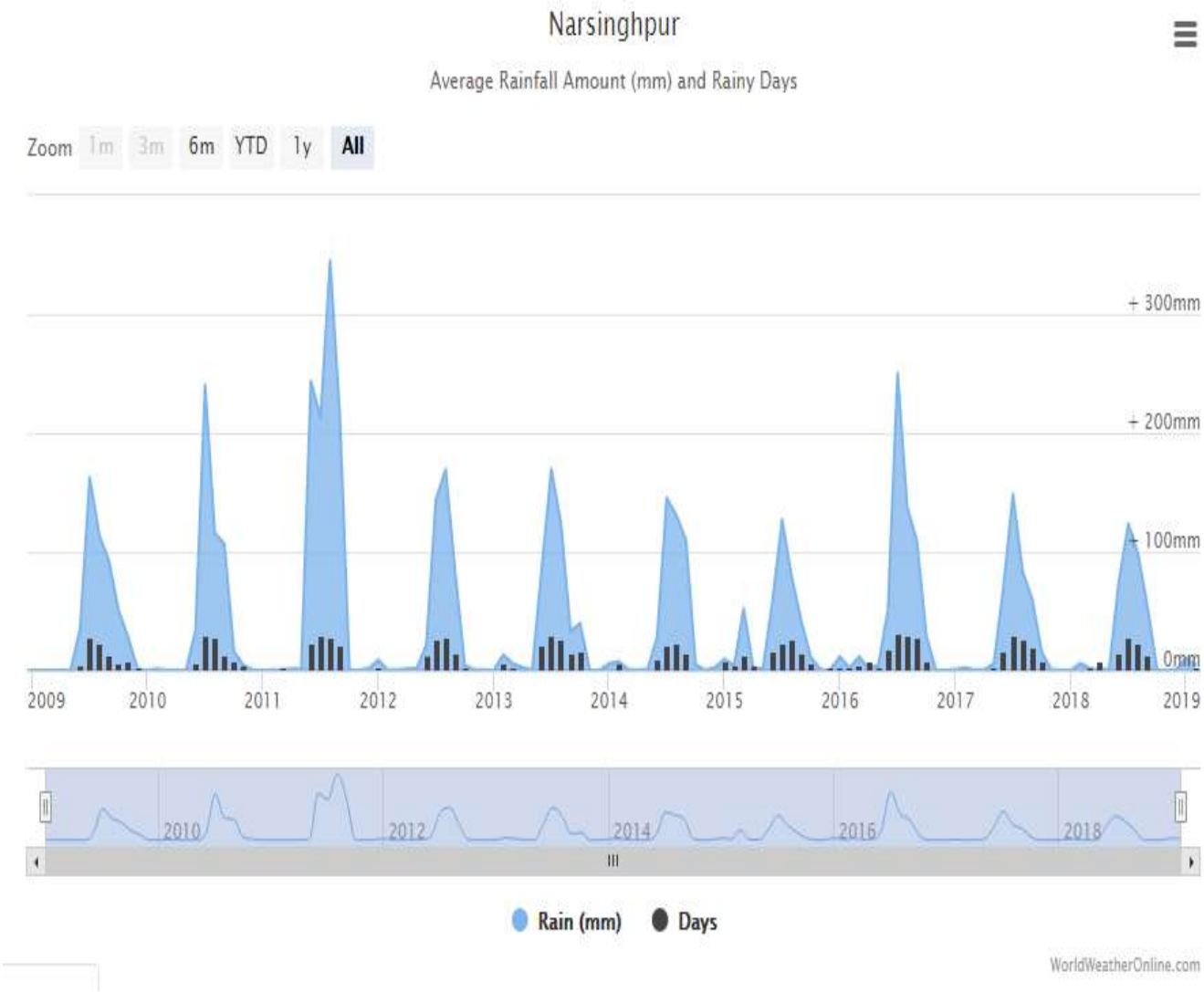
Average Rainfall of Seoni



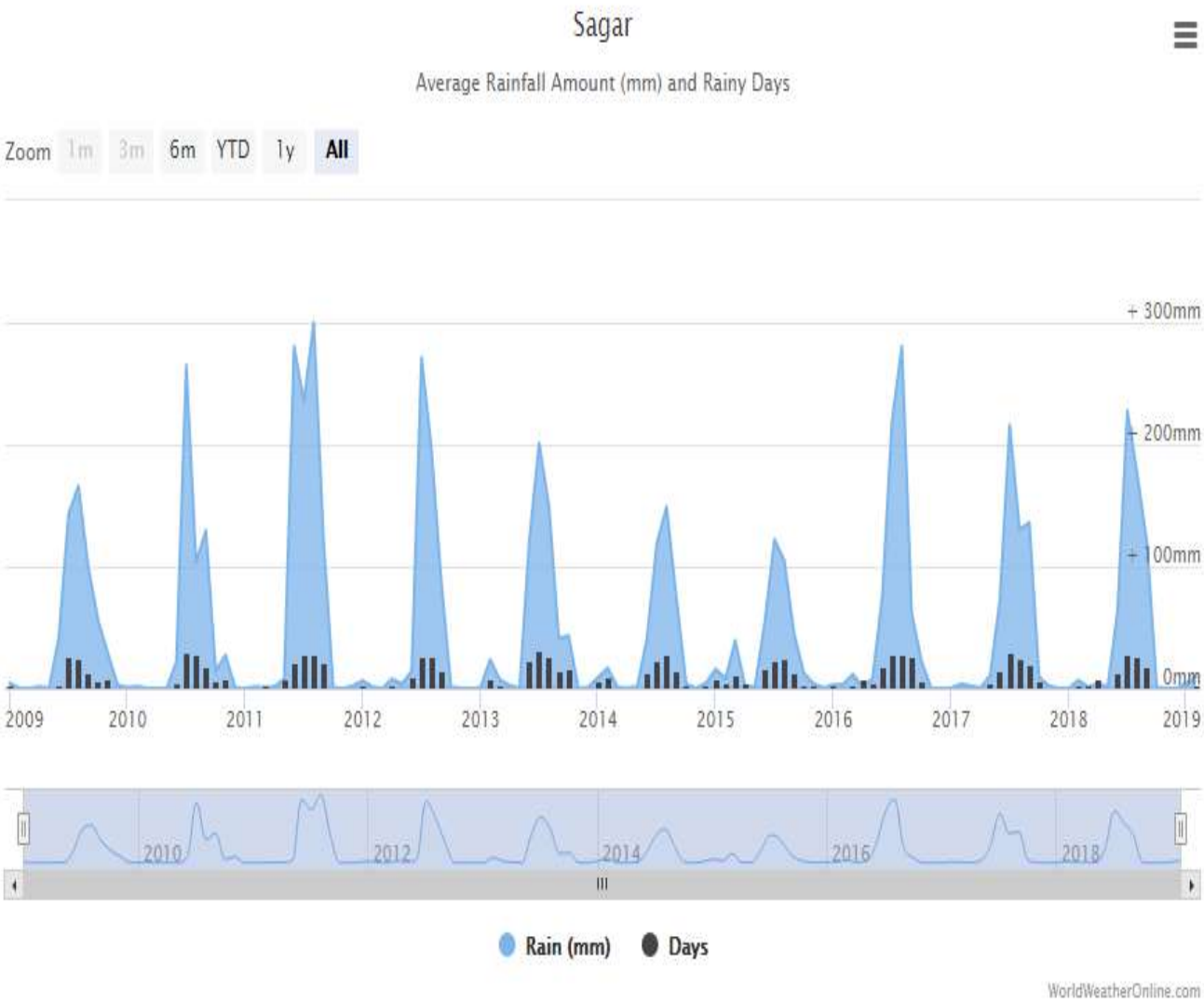
Average Rainfall of Jabalpur



Average Rainfall of Narsinghpur

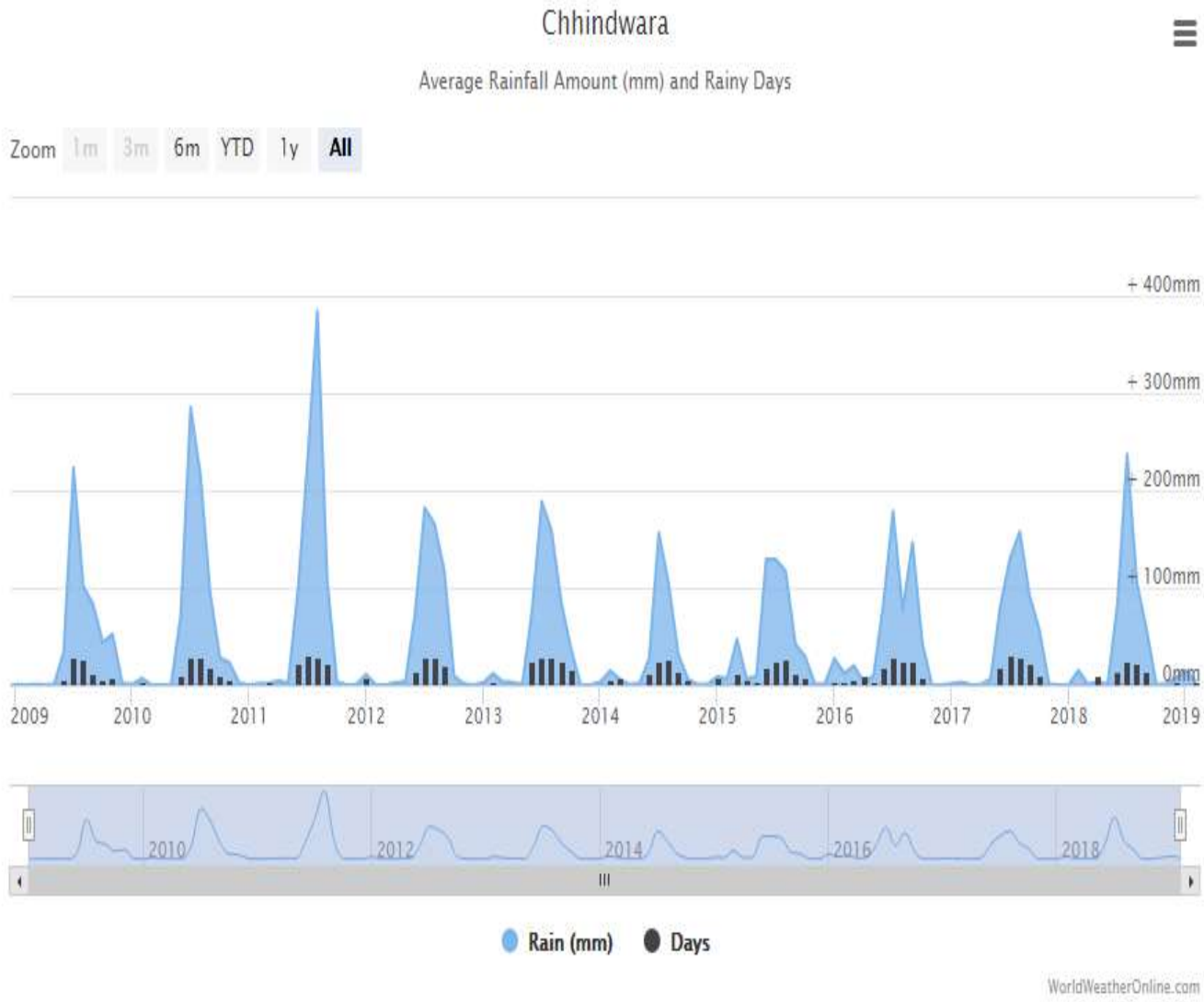


Average Rainfall of Sagar

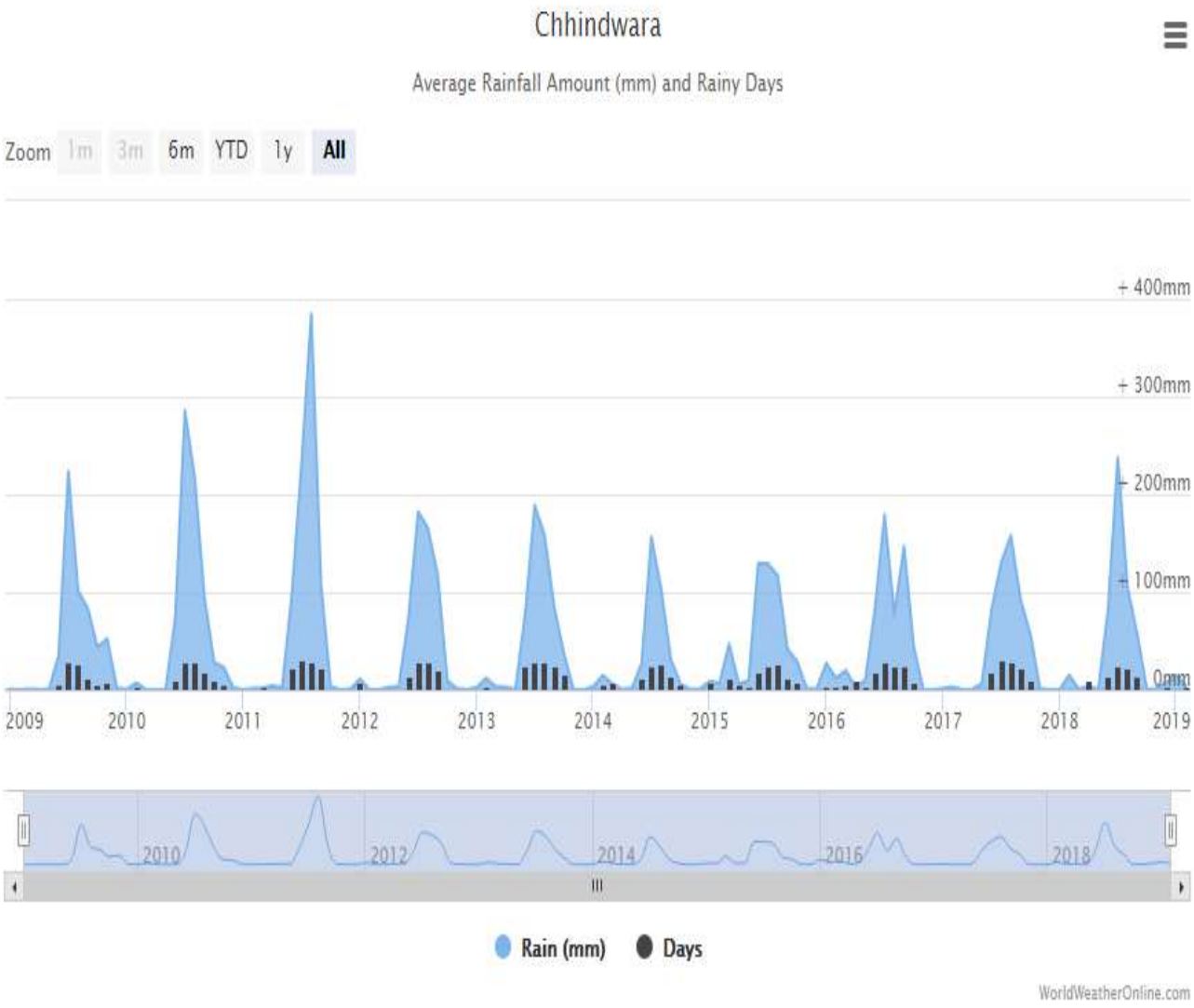


Average Rainfall of Damoh

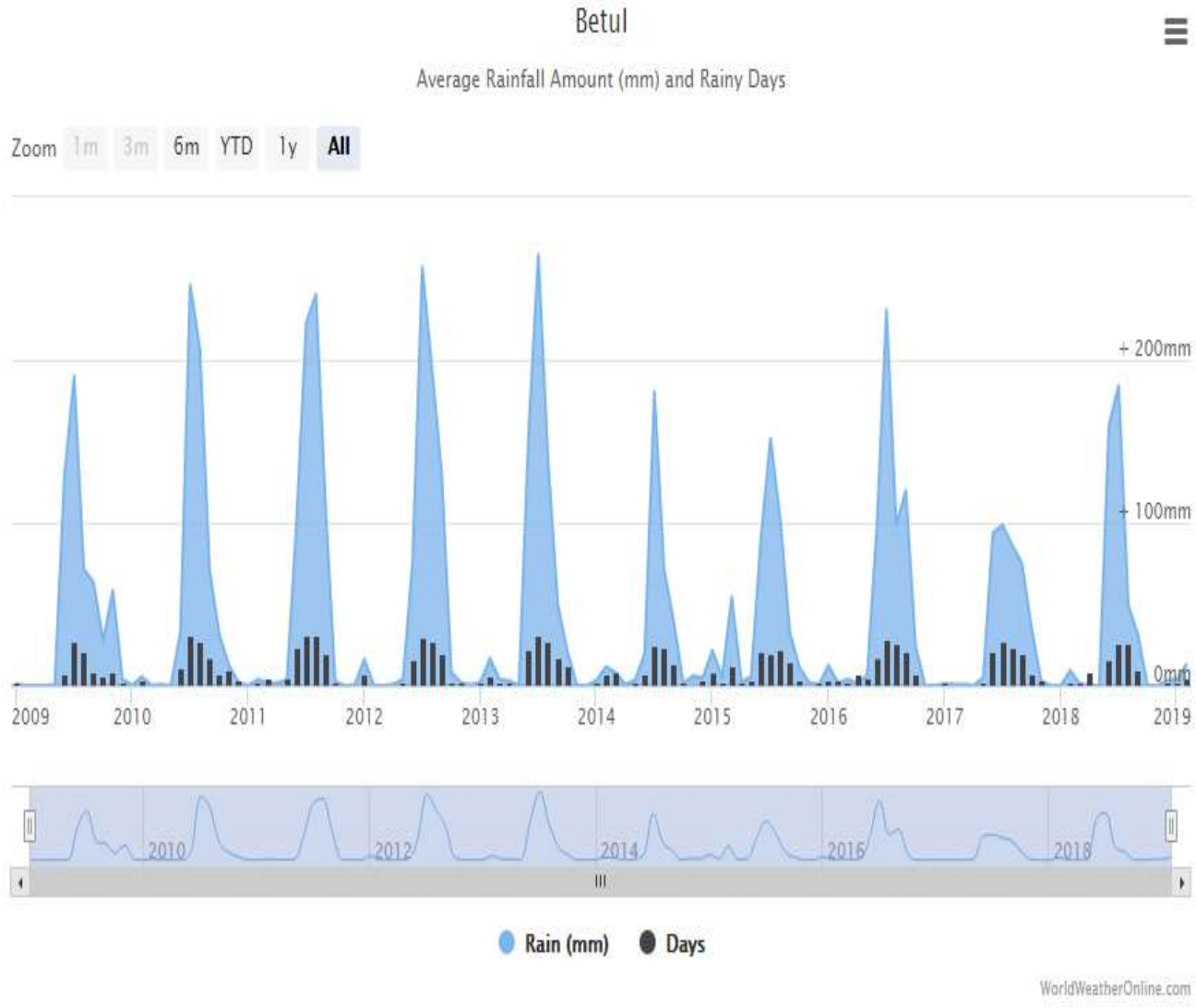
Average Rainfall of Chindwara



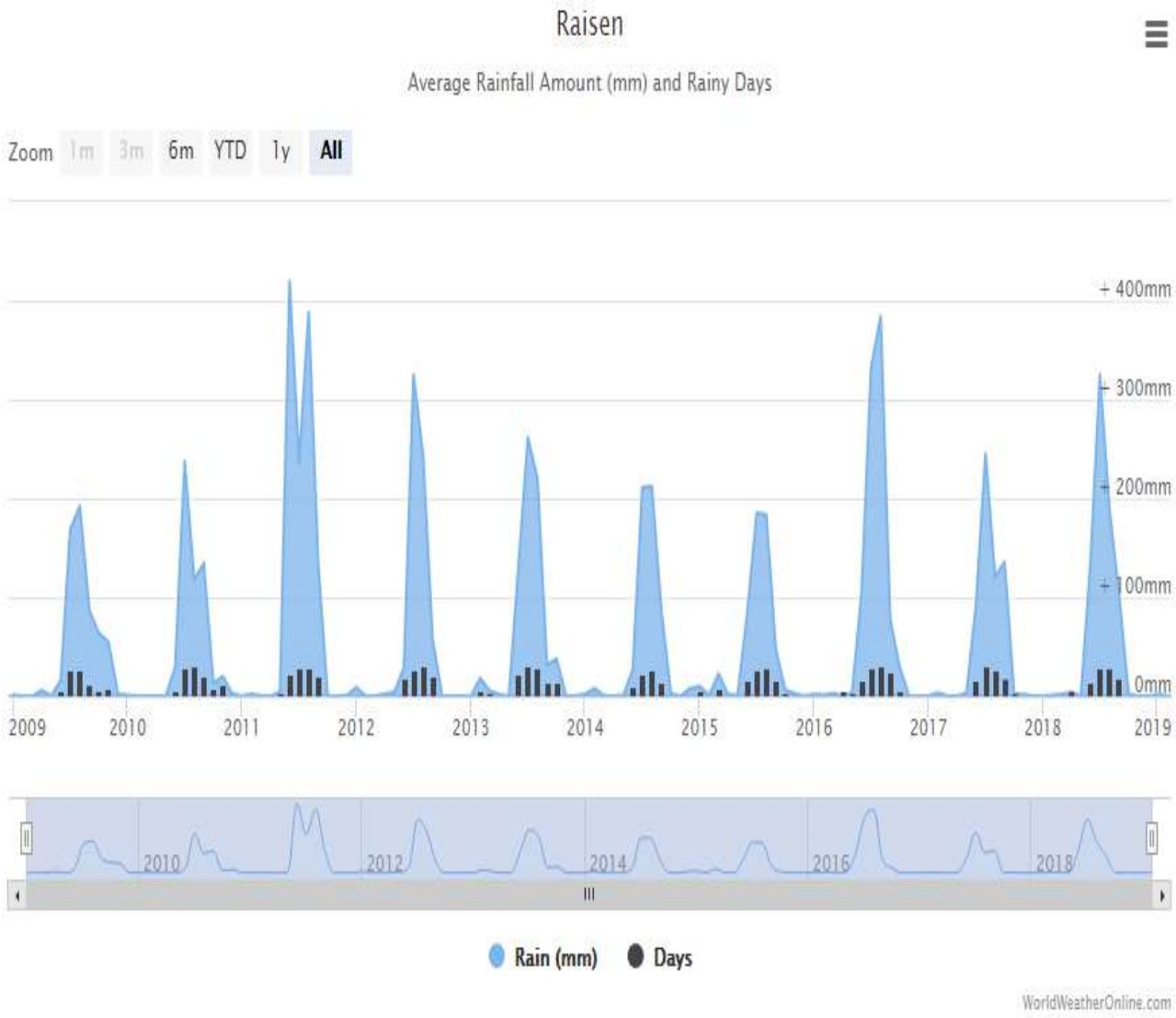
Average Rainfall of Hosangabad



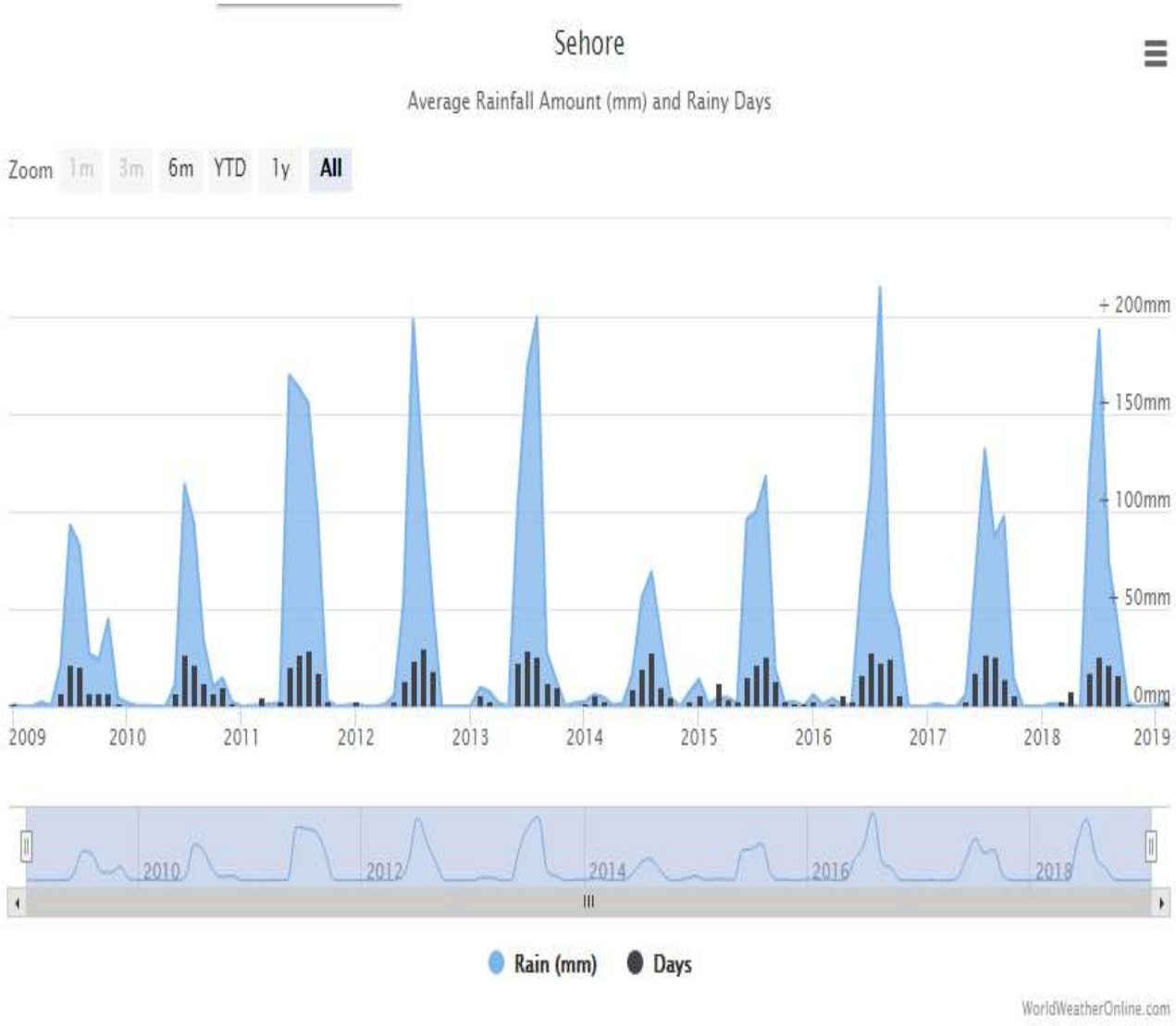
Average Rainfall of Betul



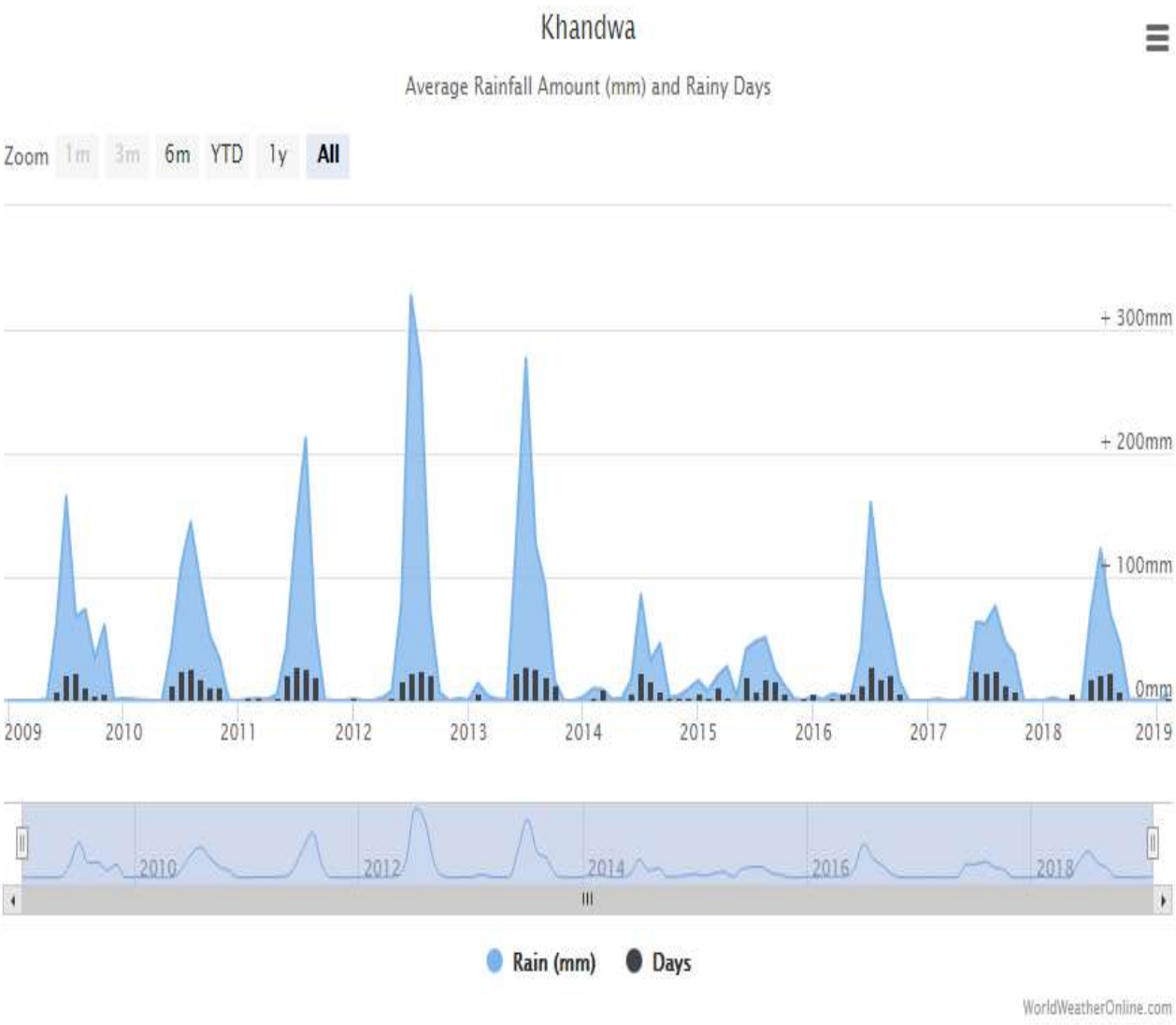
Average Rainfall of Raisen



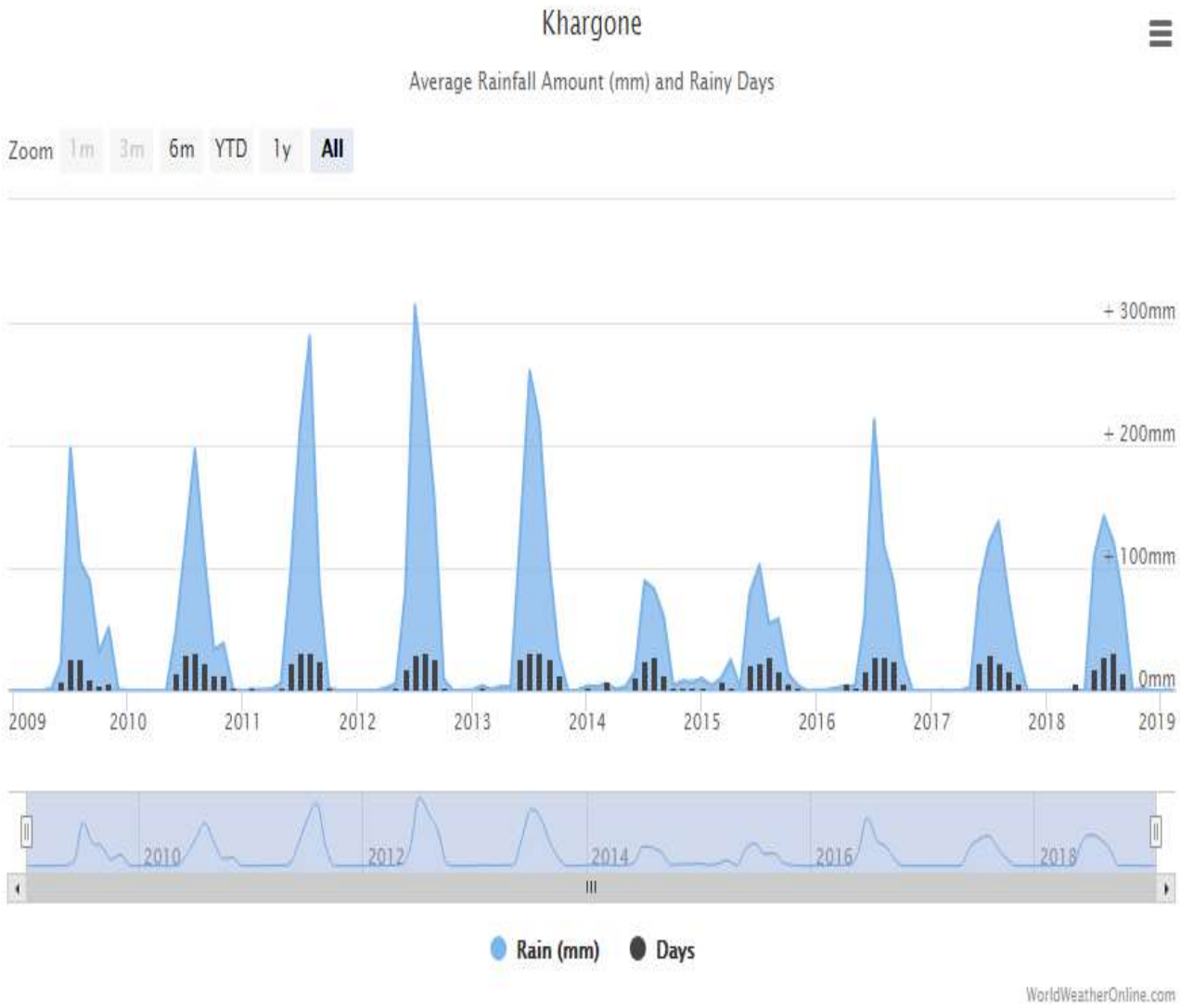
Average Rainfall of Sehore



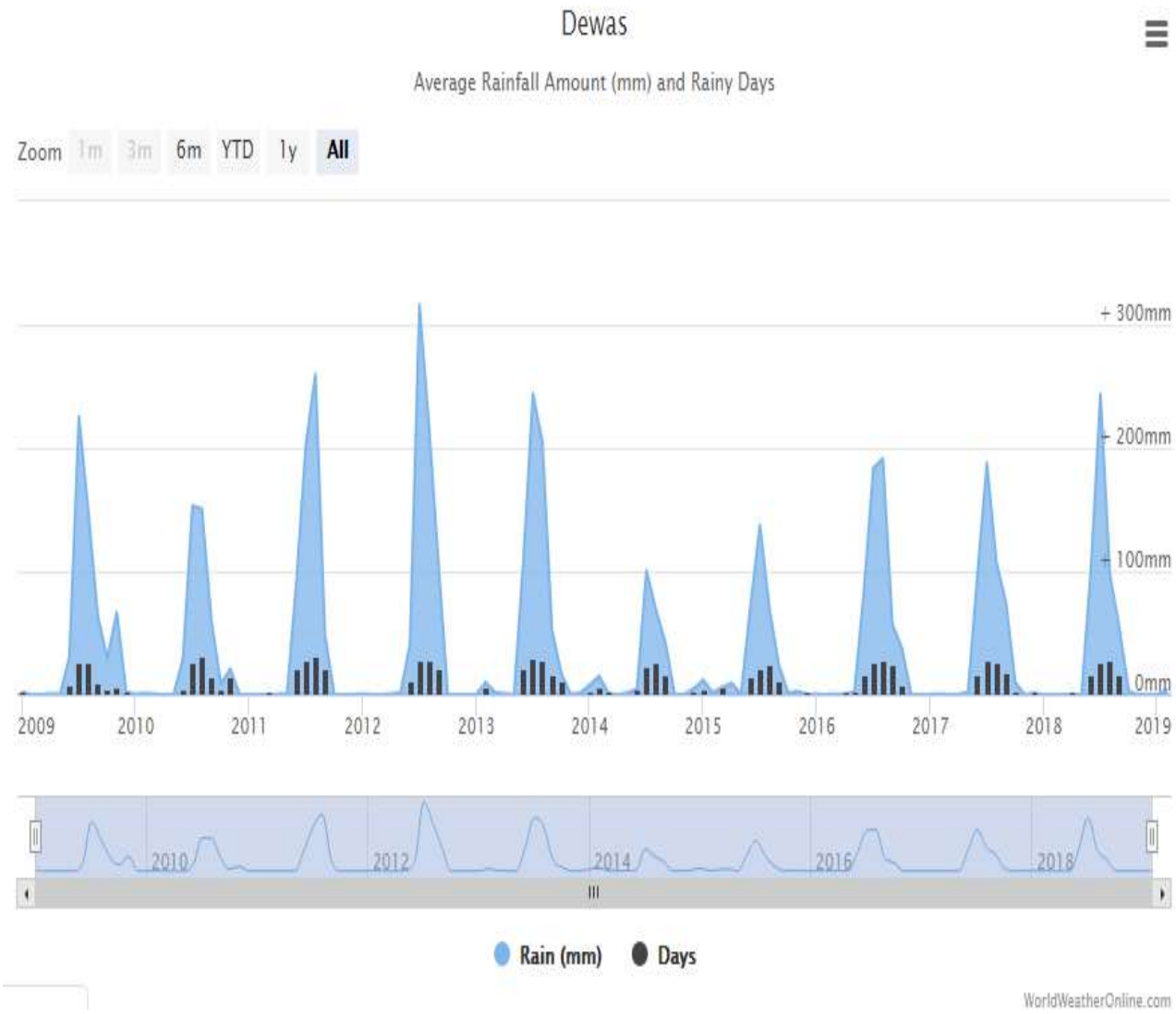
Average Rainfall of Khandwa



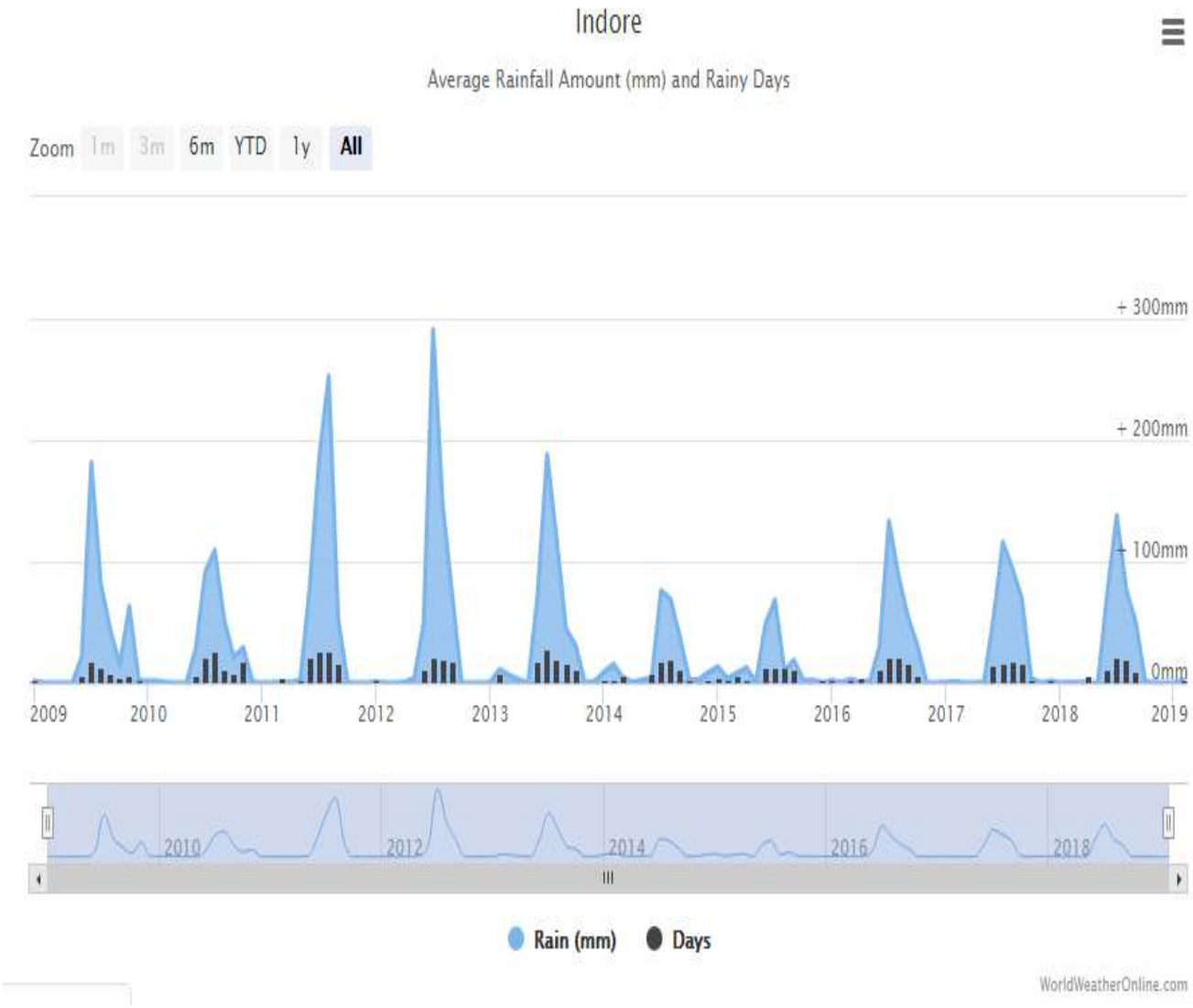
Average Rainfall of Khargone



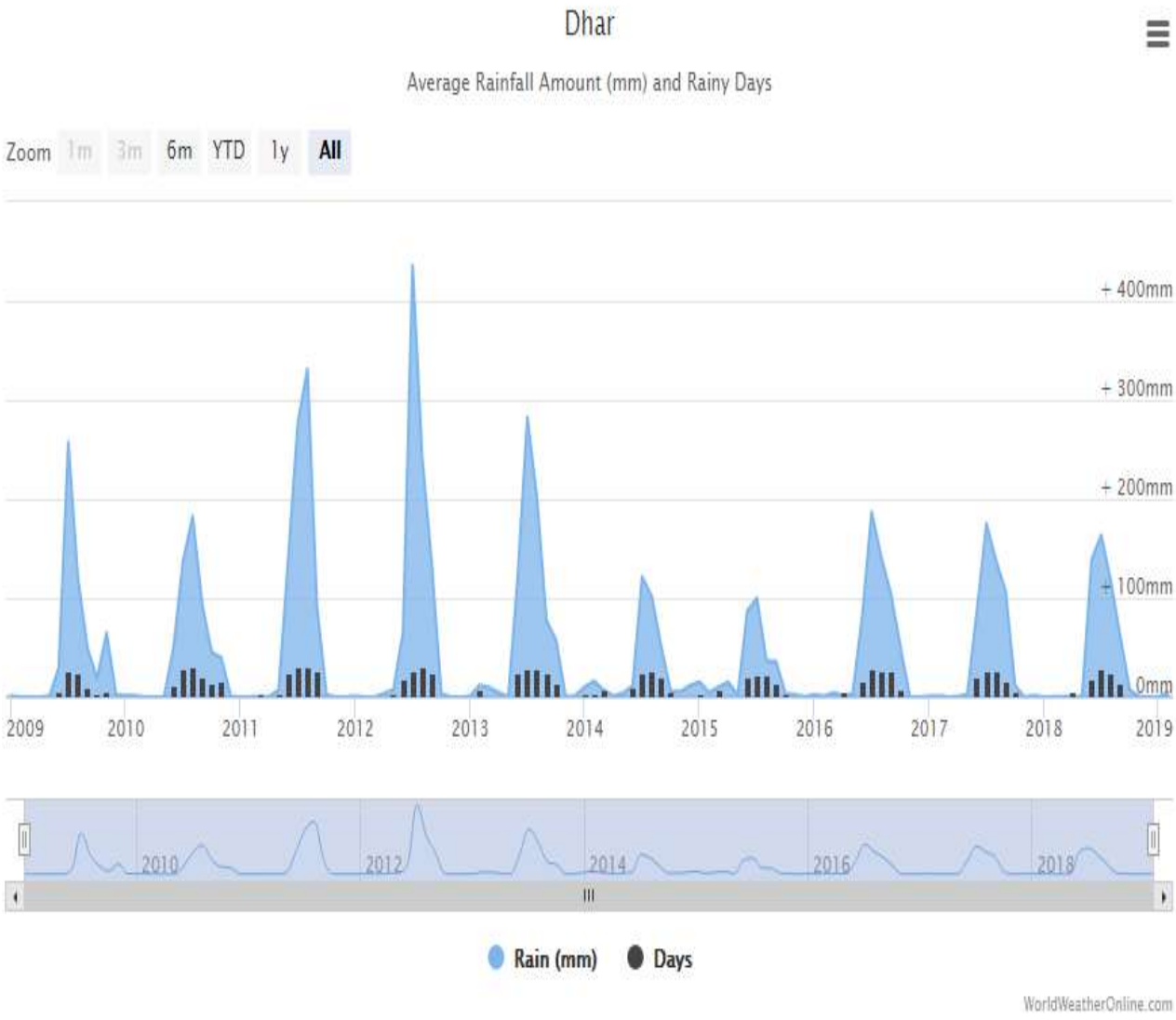
Average Rainfall of Dewas



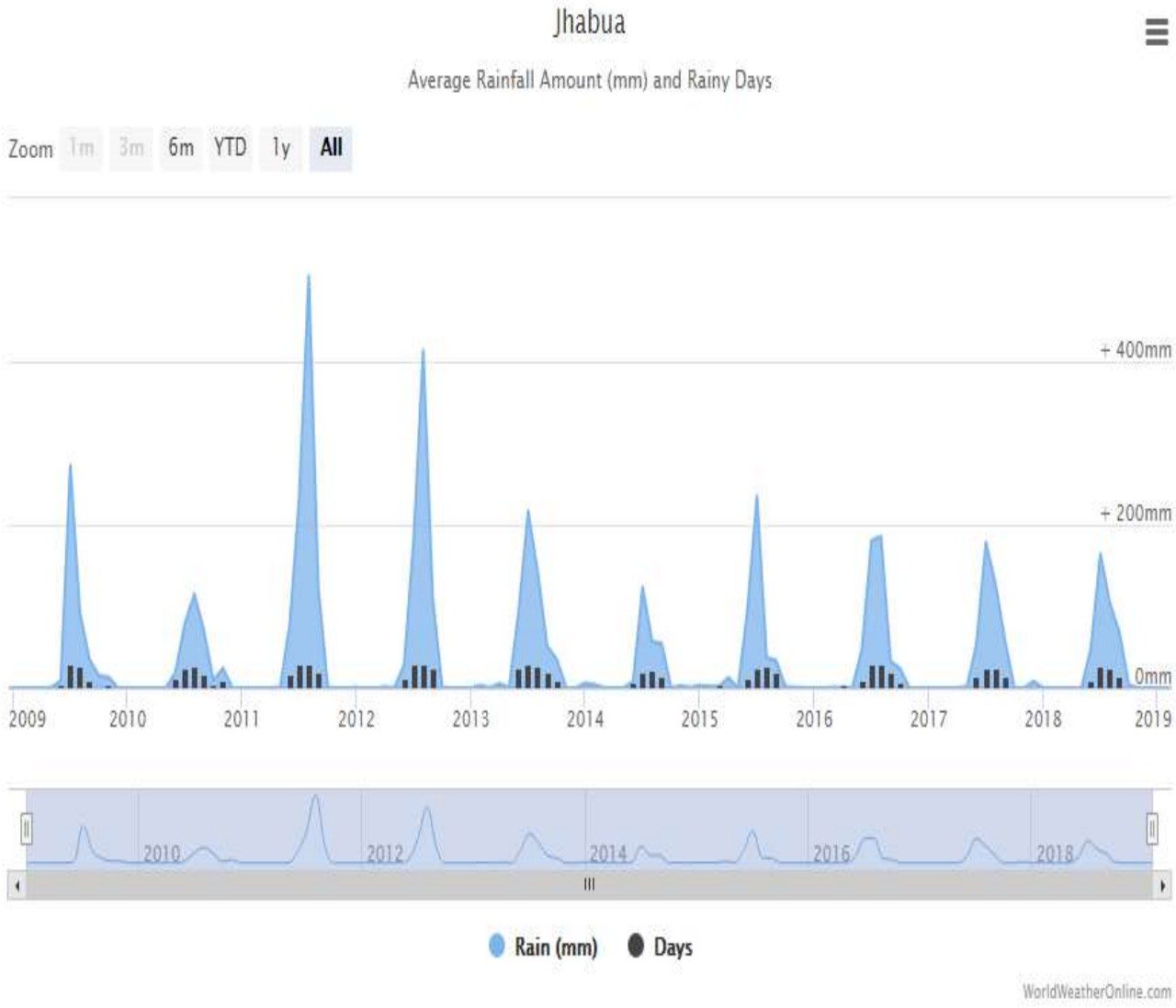
Average Rainfall of Indore



Average Rainfall of Dhar



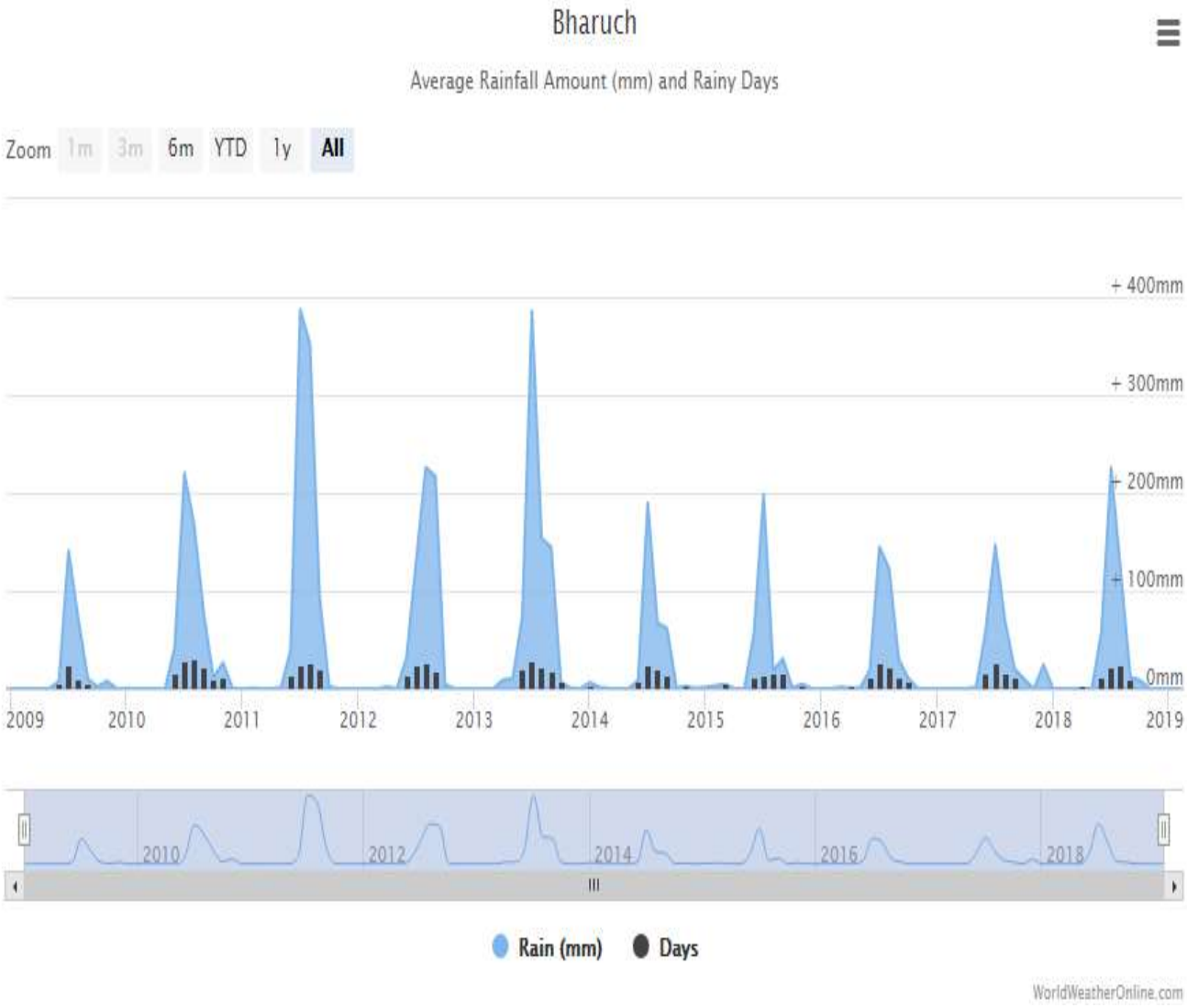
Average Rainfall of Jhabua



Average Rainfall of Dhule

Average Rainfall of Vadodara

Average Rainfall of Bharuch



2.3.3 Wind

The wind speed data of the basin is given in Table 2-8. The average monthly wind speed in the Narmada Basin varies between about 1.4 km/h and 16 km/h in the post - monsoon &pre monsoon seasons, the wind speed is generally higher. The maximum percentage of calm occurs between October & December. The predominant wind direction is NW followed by SW and W.

Table 2-8 Wind Speed and Direction Data for Narmada Basin

Month/	Average Wind Speed km/h)						Calm Period %						Dominant Direction					
Location	HO	PAC	KHN	JA	PEN	VA	HO	PAC	KHN	JA	PEN	VA	HO	PAC	KHN	JA	PEN	VA
January	4.2	3.3	5.7	3.4	5.3	7.1	29	29	22	31	20	17	E/NE/SE	NW/N/N	NE/NW/N	SE/NE/N	N/S	N/NW
February	4.2	4.2	6.4	4.0	6.1	6.5	27	20	21	28	18	13	E/NE	NW/W/N	NW/N/NE	SE/NE/N	N/WW	N/NW
March	4.6	4.5	7.4	4.6	7.0	6.7	31	17	15	23	14	13	E/SW/W	NW/W	NW/W	SE/NW/N	N/WW	N/W/NW
April	5.2	5.1	9.6	5.5	7.5	7.3	31	12	6	20	11	8	W/SW	NW/W	NW/W	SE/NW	N/S/NW	NW/N/SW
May	6.4	6.8	14.1	7.1	9.3	12.1	16	6	1	11	7	2	W/SW	NW/N	NW/N	SW/W/NW	N/S/NW	SW/W
June	6.8	7.2	15.8	8.6	9.5	15.6	14	7	2	9	8	2	W/SW	NW/N	NW/W/SW	SW/W	WES/NW	SW/W/W
July	6.1	9.0	14.0	8.2	8.0	13.0	17	7	2	13	14	2	W/WS	NW/W	W/SW	SW/W	S/SW	SW/S/W
August	5.4	8.3	12.4	7.6	6.8	10.7	23	8	2	14	15	4	W/SW	NW/W	W/SW	SW/W	S/NW	SW/W
September	1.4	6.2	9.6	5.7	5.8	7.9	29	10	4	19	12	8	W/SW	NW/W	W/SW	SW/W	N/S/NW	SW/W
October	3.1	3.6	5.3	3.5	4.1	6.4	44	27	17	29	25	26	E/NE	NE	N/NE	SE/NE	N/NW	N/NE/NW
November	3.0	2.8	4.3	2.8	3.7	6.5	42	36	3	32	31	14	E/NE	NE/N	N/NE	SE/NE	N/NW	N/NE/NW
December	3.5	2.7	4.3	2.7	4.1	6.1	36	38	28	35	29	15	E/NE	NE/N	N/NE	SE/NE	N/NW	N/NE/NW
	4.7	5.3	9.1	5.3	6.4	8.8	28	18	12	22	17	9	EW/SW	NW/W	W/NW	SE/SW/NE	N/S/NW	SW/NW/W

HO: Hoshangabad

PAC: Pachmarhi

KHN: Khandwa

JA: Jabalpur

PEN: Pendra Road

VA: Vadodara

Source: Basin Sub-basin Inventory of Water Pollution- The Narmada Basin, CPCB, Delhi March 1994.

2.3.4 Evaporation

The process of evaporation depends upon wind velocity, altitude, temperature and humidity. In summer, evaporation loss in the upper Zone of Narmada is between 6.0-10.0 mm/d. In Jabalpur region monitored at Jamtara, evaporation loss is considerably less i.e. between 4.0-7.0 mm/d. It is due to increase of humidity level by nearby Bargi Reservoir. Evaporation loss immediately increases at Barmanghat (Narsinghpur region) where it is between 6.0-12.0 mm/d. In middle zone monitored at

Hoshangabad,evaporation loss is also less and is between 4.0-7.0 mm/d. Tawa reservoir and Barna dam are nearer to this place. Evaporation loss is more in lower Zone of Narmada monitored at Rajghat near Barwani. It is between 12.0-28.0 mm/d. In winter, evaporation loss is less in upper and middle Zone of Narmada and is between 1.0-3.0 mm/d. In lower Zone, evaporation loss is between 6.0-9.0 mm/d in winter season.

2.3.5 Humidity

The relative humidity in basin varies between 92% and 27% in the morning and between 88% and 15% in evening, depending upon the season. The relative humidity is naturally maximum during the monsoon months and is around 80% to 90%. In the winter months of December and January, the relative humidity comes down to around 30%. The variation in relative humidity between upper, middle and lower sections of the basin is not very pronounced. The relative humidity at various IMD station representative of the Narmada Basin is given in **Table 2-9**.

Table 2-9 Relative Humidity Data for Narmada Basin

Month/	Relative Humidity in Morning (%)						Relative Humidity in Evening (%)					
Location	HO	PAC	KHN	JA	PEN	VA	HO	PAC	KHN	JA	PEN	VA
January	62	65	56	74	64	60	37	49	29	43	48	31
February	51	54	44	64	55	47	25	37	23	32	38	20
March	37	36	32	44	39	48	17	25	17	23	28	20
April	28	29	29	30	30	46	15	22	16	18	23	17
May	30	33	41	27	31	59	17	23	18	17	24	25
June	62	86	66	57	60	75	44	55	44	45	55	52
July	87	91	83	85	86	87	78	87	71	79	83	74
August	89	92	84	87	87	89	78	88	73	80	85	75
September	85	86	82	82	84	83	70	82	66	71	80	63
October	69	64	64	73	70	68	48	56	41	52	63	43
November	64	58	58	68	57	55	38	50	35	44	49	34
December	62	65	58	723	60	58	37	47	32	43	47	32
Annual Mean	61	62	58	64	60	65	42	52	39	46	52	41

HO: Hoshangabad

PAC: Pachmarhi

KHN: Khandwa

JA: Jabalpur

Month/	Relative Humidity in Morning (%)						Relative Humidity in Evening (%)					
Location	HO	PAC	KHN	JA	PEN	VA	HO	PAC	KHN	JA	PEN	VA

PEN: Pendra Road

VA: Vadodara

Source: Basin Sub-basin Inventory of Water Pollution- The Narmada Basin, CPCB, Delhi March 1994

2.4 Geology

About 270 million years ago, the continents existed in two large masses and India was a part of the southern continental mass commonly known as GondwanaLand. Between the two continents, a large sea, Tethys existed. Presently the Himalayas and the Tibetan Plateau have taken the position of the ancient TethyanSea. The GondwanaLand was intruded by few large marine transgressions. A deep gulf or sea existed along the Sindh-Beluchisthan and the Kutchh. At one time, a marine ravine penetrated the very centre of Peninsular India through a narrow inlet along the present valley of Narmada. During this time India was divided into two halves by narrow strips of marine transgressions and there was no land communication between the Peninsular and northern India.

Along the Narmada Valley, several patches of sediments have been deposited which contains ancient remains of animals. These fossils are similar to those found along the tracts of Tapi river. Such similarity probably suggests that even about 3 million years ago, Narmada and Tapi were confluent and the separate fate of these two rivers was decided by recent earth movements. The Bheraghat falls of Narmada, near Jabalpur, was probably created during one such movement which appears to be a recent one.

The geological sequence in the basin is presented in **Table 2-10.** The Archaean group of rocks in the Narmada basin is represented by the Chilpighat series. These rocks wedge in at the eastern end between the Vindhyans and granitic gneisses and expand in the Narmada valley in strips. The Dharwadian rocks consisting mainly of quartzites, feldspar grits, shales and slates with intercaliated traps occur in Balaghat, Chhindwara, Jabalpur districts of Narmada valley. In Jabalpur area, the series is distinguished by perfectly crystalline dolomatic limestone. The famous "marble rocks" of Jabalpur belong to this series.

Table 2-10 Geological Sequence in Narmada Basin

Major Groups	Dominant Rocks	Age in Million Years.
Recent Alluvium	Alluvium	2-3
Deccan trap	Basalt	60-135
Lametas	Limestone, Sandstone	135-150
Gondwanas	Sandstone, Volcanics	150-400
Vindhyans	Sandstone, Shales	600-4500

Bijawars	Quartsites, Sandstone	600-4500
Archaeans	Quartsites, Shales, Slates	600-4500

On the upturned edges of the Archaeans, the Cuddapahs were deposited and the Narmada Valley is represented by Bijawars. The Bijawars occur in series of out crops extending from Bundelkhand to the south of Narmada and has thickness of less than 240m at some places. These rocks are generally characterised by quartzites, sandstones and sometimes conglomerates. Bijawars are found in Dhar and Jabalpur districts. In Jabalpur, however, Bijawars are represented by somewhat different rock assemblages like phyllites, mica, schists, calcitic and dolomatic marbles. There is, however, some controversy over the age of the rocks and some geologists feel that they are older than Cuddapahs and should be classified along with upper Archaeans i.e. Dharwadian rocks.

The Cuddapahs were succeeded by rocks of Vindhyan system after a time interval marked by earth movement and erosion. The Vindhyan rock characterised by Bhander Sandstones, shales, limestones and Ganurgarh shales are exposed in the north of Hoshangabad town and extends upto Bhopal. Between Dewas and Khandwa in Parnakheri, thick Vindyans are exposed along the banks of Narmada mainly characterised by Bhander group of rocks and unclassified upper Vindhyans.

After the deposition of Vindhyan rocks and their uplift, there was a great hiatus in the stratigraphical history of the peninsula. At the end of Palaeozoic era, a series of changes took place which were also responsible for the mountain building movements called the Hereynian or Variscan orogeny. Due to this movement, the continents separated to the present configuration. The deposits during this period are called Gondwana and is exposed in the south of Hoshangabad. Thick Gondwana sediments are also found near Jabalpur, Rewa, Pachmarhi etc. The Gondwana formation ended in Cretaceous era i.e. about 135 million years ago. The end of cretaceous was marked by enormous lava flows which spread over vast areas of central and eastern India. These lavas of basaltic composition are found in the Khandwa, Khargone, Dhar, Dhule areas till practically up to the lower Narmada region. The interesting geological episode in the Narmada valley are the Lameta beds, which occur in Lameta ghats near Jabalpur The Lameta beds represents the fluviatile or esturine deposits just below the trap basalts.The mouth of the Narmada witnesses thick sedimentary deposits of recent age. These sediments are often saline but otherwise supports bumper crops.

2.5 Soils

Although no detailed soil survey has been carried out in the basin, periodically some soil surveys have been carried out in different parts of the basin under different schemes and for different purposes. In 1950, the Central Water Commission conducted soil surveys in the command areas of various projects and produced some maps on a 1:2,50,000 scale. Some of the projects covered are give in **Table 2-11**.

Table 2-11 Soil Surveys carried out by the Central Water Commission in Various Projects in Narmada Basin

S.No.	Project	Districts	Area in lakh ha.

1	Tawa	Hoshangabad	3.70
2	Bargi	Jabalpur, Narsinghpur	3.60
3	Kolar	Sehore	0.75
4	Punasa	Khandwa, Khargone	0.60
5	Barwah	Khargone, Dhar	1.60

As per the demand of Narmada Water Disputes Tribunal, a reconnaissance survey of the Narmada Sagar command area was taken up in 1975. Nearly 256 soil profiles were studied. Again during 1982-83, an area of about 2.8 lakh ha, falling within the Khandwa and Khargone districts, was surveyed by the department of Agriculture, MP to appraise the land irrigability in connection with project. Aerial photo surveys were carried out, and 366 profiles and 2,780 auger bores were examined.

The soil map of the area is given in **Figure 2-7.**In the upper basin, the majority of the soil are characterised by shallow black soils. These soils are erosional products of trap basalts. The black soils are rich in smeclite clays having a high water holding capacity. These clay lattices expand when they absorb water and thus reduce the water drainage. The organic matter is generally less than 5% in black soils. The black soil in the upper basin is generally in-situ kor collovial. These soils are often inter spread with red sandy or laterite soils. The profile is generally shallow and mainly covers the hilltops and plateau regions. The red soils are the result of intense chemical leaching of basalts whereby all the minerals in the rock are leached out except the oxides of silica, iron and aluminium. Due to intense leaching, these soils have a reasonably good drainage but lacking in nutrients essential for plant growth.

The soils in the Vindhyan and Satpura plateau region of the middle basin range from shallow black soils to medium black soils. Around Hoshangabad, recent alluviums with varied thickness can be witnessed. These soils are extremely fertile and supports cotton, Jawar and wheat.

In the lower part of the basin, the major soils of the valley and southern plateau are medium deep black soils. On the other hand mixed red and black soils occur in the northern plateau. In the mouth of the Narmada, Pliocene rocks along with recent alluviums are seen. These alluvial soils are mostly sandy looms with good drainage. They are extremely fertile and support good crops.

2.6 Minerals

The minerals found in the basin are bauxite, clay, coal, dolomite, graphite, iron ore, manganese, talc, limestone etc.The mineral map of Narmada Basin is given in **Figure 2-8**.

2.7 Ground Water

The occurrence of ground water generally depends upon the rainfall, drainage, topography and the geological conditions of the area. The ground water in upper, middle and lower basin occurs in distinct horizons with characteristic aquifers.

In the upper basin, the geological formation is mainly the older rocks belonging to the Archaeans and Vindhyans and are characterised by good water potential. The ground water within part of the basin occurs mainly in the weathered zones of the rocks. The quality and quantity of the ground water is reasonably good.

In the middle part of the basin where Gondwana rocks are predominant, the ground water occurs in varied quantities in the pores of sandstones. The occurrence mainly depends on the grain size of the rocks. In the coarse grained rocks, the ground water availability is substantial. However, in the sections of the basin where the trap rocks are exposed, the ground water conditions are rather erratic. In the trap basalts, ground water occurs in patchy aquifers and often these aquifers are not interconnected.

A significant part of the lower basin is occupied by trap basalts where the ground water occurs in patchy aquifers. However, near the mouth of the river, the coastal alluvials are predominant. The coastal alluvials contain highly permeable aquifers with good quantities of water. Their yield is generally excellent, with good recharge characteristics. The ground water in this area occurs mainly in unconfined aquifers with varying depths. However, ground water in alluvials is susceptible to seasonal water table fluctuations. In thickly populated areas, these aquifers are often contaminated.

Table 2-12 gives the ground water recharge and draft characteristics. The data suggests that the average ground water utilisation in the Narmada basin is about 45%. The draft in Sehore, Khandwa, Damoh, Dhar, Dewas, Raisen, Sagar, and Khargone is above 50%. In fact, these districts account for major ground water draft in the basin. In the rest of the area, the ground water remains under-utilised, and there is scope for further ground water development.

Table 2-12 Ground Water Recharge and Draft Characteristics in the Districts of Narmada Basin

Sl. No.	District	Net Ground Water availability (ham)	Total Annual Ground Water Draft (ham)	Net Ground Water availability for Future Irrigation (ham)
1	Sehore	77172	57394	18664
2	Hoshangabad	201888	35617	164889
3	Rajnandagaon	1123.84	50.1	1073.74
4	Shahdol	63909	4083	59067
5	Mandla	53779	8205	44658
6	Chhindwara	138594	71239	65615
7	Balaghat	91248	13361	77083
8	Betul	113970	53622	59227
9	Khandwa	76949	47583	27417
10	Raisen	75209	38165	35863
11	Sagar	112807	66079	44859
12	Damoh	36385	22000	13305
13	Dhar	97163	80451	15212
14	Seoni	79239	20456	57784
15	Khargone	77219	55848	19999
16	Dewas	79141	63383	14849
17	Jhabua	20134	9305	10051

Source:Dynamic Ground Water Resources of Madhya Pradesh (As on March 2009) published by State Ground Water Survey and Central Ground Water Board North Central Region, February 2012

2.8 Description of Water Storage / Diversion Projects

A Master Plan of the Narmada basin has been prepared for the development of water resources of the Narmada basin. The Master Plan envisages the construction of 30 major dams, 135 medium dams and 3000 minor dams to irrigate about 46.3 lakh ha of land in Madhya Pradesh (27.55 lakh ha), Gujarat (18 lakh ha), and Rajasthan (0.75 lakh ha). The major and important medium projects are listed in **Table 2-13** and **Table 2-14** respectively. **Figure 2-2** gives location of important projects along with their utilisation (withdrawls).

At present, there are four major hydroelectric cum irrigation project namely *Bargi, Indira Sagar, Omkareshwar & Sardar Sarovar* Projects on main Narmada river which are almost completed and eight completed projects on different tributaries namely Matiyari, Barna, Tawa, Kolar, Sukta, Man, Jobat and Karjan. The salient features of these projects are given below:

PROJECTS ON MAIN RIVER

Rani Awanti Bai Sagar Project (Bargi): This project is located on the main river Narmada near Jabalpur. The project was constructed at a cost of Rs 98,361 lakh. It is a multipurpose project. The total catchment area of the project is 14,556 Sq km. The gross and dead storage of the reservoir is 3920 hm^3 and 740 hm^3 respectively. The 135.00 km length of left bank canal of this project irrigate 1.92 lakh ha. This project has 2 units of 45 MW each on its left bank and other 2 units of 7.5 MW each on right bank. The project was initially started during the year 1985 and Head Works were completed in the year 1987.

Indira Sagar Project: The Indira Sagar Project is a multipurpose river valley project across river Narmada in Khandwa Distt. of Madhya Pradesh at a distance of 200 km from Bhopal. It has a CCA of 1,69,000 ha at 138% intensity on the left bank of Narmada river and generate 1000 MW of hydropower. The project also envisage supply of 74 MCM of drinking water to rural areas. The revised cost of the project at 1998 price level is Rs. 5150 crores.

Omkareshwar Project: The Omkareshwar multipurpose project is constructed across river Narmada near village Mandhata of Khandwa distt. in Madhya Pradesh. The dam site is located at a distance of 77 km from Indore. The project envisage construction of 73 m high concrete dam with a gated spillway to irrigate 1,46,800 ha CCA and to generate 520 MW power. The estimated cost of project is Rs. 1846.77 crores as in 2001.

Sardar Sarovar Project: The Sardar Sarovar dam is constructed across river Narmada and is located at 170 km U/S from Gulf of Khambat in Gujarat State. It is 1210 m long and 129.5 m high dam from river bed level. SSP proposes to irrigate a command area of 1.8 million ha of Gujarat and Rajasthan States and have an installed power generation capacity of 1450 MW. The project also provide the domestic water supply to 2.35 million people of Gujarat state. Almost 90% of the work at dam site has been completed. The revised estimated cost for the project was Rs. 39240.44 crores as in 2008-09 P.L.

Table 2-13 Major Projects (Completed, On-going & Proposed) in Narmada Basin

Sl. No	Name of Project	River	Status	Capacity Gross/ Live (hm^3)	Utilisation (hm^3)
1	Karjan	Karjan	Completed	630	NA
2	Sardar Sarovar	Narmada	Completed *	9460/5740	7475.4
3	Jobat	Hathni	Completed *	77.84/70.04	47.77
4	Lower Goi	Goi	Ongoing	-	-
5	Man	Man	Completed *	145.03/125.87	153.24
6	Upper Beda	Beda	Ongoing	91.82/76.24	13.00
7	Maheshwar	Narmada	Ongoing	-	-
8	Omkareshwar	Narmada	Completed *	987/299	395.34
9	Indira Sagar	Narmada	Completed *	12220/9750	661.07
10	Sukta	Sukta	Completed	89.30/78.06	79.19
11	Ganjal	Ganjal	Proposed	-	-
12	Morand	Morand	Proposed	-	-
13	Kolar	Kolar	Completed	270/265	167.28
14	Tawa	Tawa	Completed	2311.54/1943.96	1810.69
15	Barna	Barna	Completed	539/455.78	380.95
16	Dudhi	Dudhi	Proposed	-	-
17	Sitareva	Sitareva	Proposed	-	-
18	Sakkar	Sakkar	Proposed	-	-
19	Machreva	Machreva	Proposed	-	-
20	Sher	Sher	Proposed	-	-
21	Chinki	Narmada	Proposed	-	-
22	Ataria	Hiran	Proposed	-	-
23	Rani Awanti Bai Sagar (Bargi)	Narmada	Completed	3920/3180	949.73
24	Matiyari	Matiyari	Completed	56.8/51.12	57.66
25	Basania	Narmada	Proposed	-	-
26	Halon	Halon	Proposed	-	-
27	Upper Burner	Burner	Proposed	-	-
28	Roosira	Narmada	Proposed	-	-
29	Raghavpur	Narmada	Proposed	-	-
30	Upper Narmada	Narmada	Proposed	-	-

Sl. No	Name of Project	River	Status	Capacity Gross/ Live (hm^3)	Utilisation (hm^3)
* : Though the Head work in project(s) is(are) complete, Fully Designed irrigation potential is yet to be developed. As the reservoir is ready, the projects are stated as complete for water year book purpose.					

Source: Annual Water Account of Narmada Basin up to Sardar Sarovar Dam site, Water Year 2015-16, Published by NCA.

PROJECTS ON TRIBUTARIES

Matiyari Project: This project is located on river Matiyari, a sub-tributary of Narmada near village Simariya in Mandla District. The project is constructed at a cost of Rs. 1558.40 lakh. It is mainly an irrigation project. The total catchment area of the project is 158.75 sq km. The gross and dead storage of the reservoir is 58.80 hm^3 and 5.68 hm^3 respectively. About 10120 ha of land is being irrigated through 78 km length of canal.

Barna Project: This project is located on river Barna, a tributary of river Narmada about 20 km from Bareli in Raisen District. The project is constructed at a cost of Rs. 153.7 lakh. It is mainly an irrigation project. The total catchment area of the project is 1,176 sq km. The gross and dead storage of the reservoir are 538.3 hm^3 and 83.15 hm^3 respectively. About 54,915 ha of land is being irrigated through 39.05 km length of canal. The project was commissioned during 1973.

Tawa Project: This project is located on river Tawa, a tributary of river Narmada, 9 km from Bagra Tawa railway station in Hoshangabad District. The project is constructed at a cost of Rs. 9,142 lakh. It is mainly an irrigation project. The total catchment area of the project is 5,983 km^2. The gross and dead storage of the reservoir is 2,248.8 hm^3 and 255.6 hm^3 respectively. About 2.47 lakh ha of land is being irrigated through 187 km length of canal. The project was commissioned during 1977.

Kolar Project: This project is located on river Kolar a tributary of river Narmada near village Lavakhedi (Birpur) about 32 km southwest of Bhopal. The estimated cost of the project is Rs 139.14 Crore as approved by TAC. Catchment area up to the dam site is 508 sq km. GCA, CCA and annual irrigation of the project are 62,752 ha, 45,087 ha and 60,868 ha respectively. In addition to irrigational facilities, the project also provides 56.75 hm^3 (34 MGD) drinking water to the Bhopal city. Gross and live storage capacities of the project are 270 hm^3 and 265 hm^3 respectively.

Sukta Project: This project is located on river Sukta, a tributary of river Narmada near village Khirala about 40 km from Khandwa (in Khandwa District). The project is constructed at a cost of Rs. 1,189.65 lakh. It is mainly irrigation cum domestic water supply project. The total catchment area of the project is 469 sq km. The gross and dead storage of reservoir is 96.85 hm^3 and 11.30 hm^3 respectively. About 16,599 ha of land is being irrigated through 23.48 km length of canal. The project was commissioned during 1980 and finally completed during 1984.

Man Project: Man Irrigation Project in Dhar Distt. of Madhya Pradesh envisage construction of a composite dam across river Man (a tributary of river Narmada) near village Jeerabad of Gandhwani Tehsil. It is located on Dhar – Manawar state highway at a distance of 60 km from Dhar and 320 km from Bhopal. The project has partially lined canal system taking off from both flanks of the dam to provide irrigation in a

CCA of 15,000 ha with annual irrigation of 19,200 ha. The estimated cost of project was 176.75 crores in 2004.

Jobat Project: Jobat irrigation project in Madhya Pradesh envisage construction of a composite dam across river Hathni (a tributary of river Narmada) near village Waskal, 24 km away from Kukshi town and 400 km from Bhopal. A 29.73 km long main canal is proposed with distribution network to provide irrigation to 9,848 ha of CCA on the left bank of river Hathani to benefit 27 villages of Kukshi Tehsil in Dhar Distt. Work pertains to Head works is completed in all respect and at an average 90% work pertains to canal system is also completed.

Karjan Project: This project is located on river Karjan a tributary of river Narmada near village Jitgadh in district Bharuch (Rajpipla narrow gauge Railway station is 10 km from dam site). The project is constructed at a cost of Rs. 13,861.3 lakh. It is a major irrigation project. The catchment area of the project is 1,403.78 sq km. The gross and dead storage of the reservoir is 630.0 hm^3 and 49.0 hm^3 respectively. About 56,200 ha of land is being irrigated through 63.605 km length of canal. The project was commissioned during June 1987.

Table 2-14 Medium Projects in Narmada Basin (Completed & On-going & Proposed)

Sl. No.	Name of project	River/Tributary	Status	Capacity Gross/Live (hm^3)	Utilisation (hm^3)
1	Jalgaon	Banjar/Local Nalla	Completed	0.3/0.30	5.09
2	Banjar	Banjar/Gahra Nalla	Completed	14.76/13.71	5.63
3	Bohribund tank	Bhuta Nalla/Hiran	Completed	36.93/34..52	13.88
4	Bichhia tank	Kolar Nalla/Banjar	-do-	7.87/7.23	6.37
5	Dhuandhar tank	Dhuandhar Nalla/Banjar	-do-	5.25/5.11	2.95
6	Mehgaontola tank	Bidri Nalla/Gour	-do-	11.62/10.51	9.00
7	Barnoo tank	Barnoo Nalla	-do-	9.90/9.51	2.08
8	Madai tank	Madai Nall	-do-	8.21/7.92	2.46
9	Pariyat tank	Pariyat Nalla	-do-	20.30/18.47	19.33
10	Dukrikheda tank	Ghogra Nalla/ Sukhri	-do-	13.37/12.64	5.63
11	Chandra Keshar tank	Chandra Keshar	-do-	30.06/28.48	24.37
12	Paras tank	Paras	-do-	7.53/6.10	5.75
13	Sampna tank	Sampna	-do-	16.92/14.32	14.31
14	Upper Beda	Beda	Ongoing	91.82/76.24	13.00

Sl. No.	Name of project	River/Tributary	Status	Capacity Gross/Live (hm^3)	Utilisation (hm^3)
15	Choral Nakheri tank (Choral)	Choral Nakheri	-do-	23.92/19.23	19.20
16	Choral Nakheri tank (Nakheri)	Choral Nakheri	-do-	Feeder Tank	-
17	Segwal tank	Sazar Nalla/Borad	Completed	8.62/8.12	8.12
18	Satak tank	Satak	Completed	19.79/18.37	14.08
19	Dejla Dewada tank	Kundi	Completed	56.35/50.29	97.53
20	Kunda tank	Buti Nalla	Completed	8.50/8.10	8.10
21	Sukalda tank	Chiri & Khug Nalla	Completed	15.56/12.69	11.68

Source: Annual Water Account of Narmada Basin up to Sardar Sarovar Dam site, Water Year 2015-16, Published by NCA.

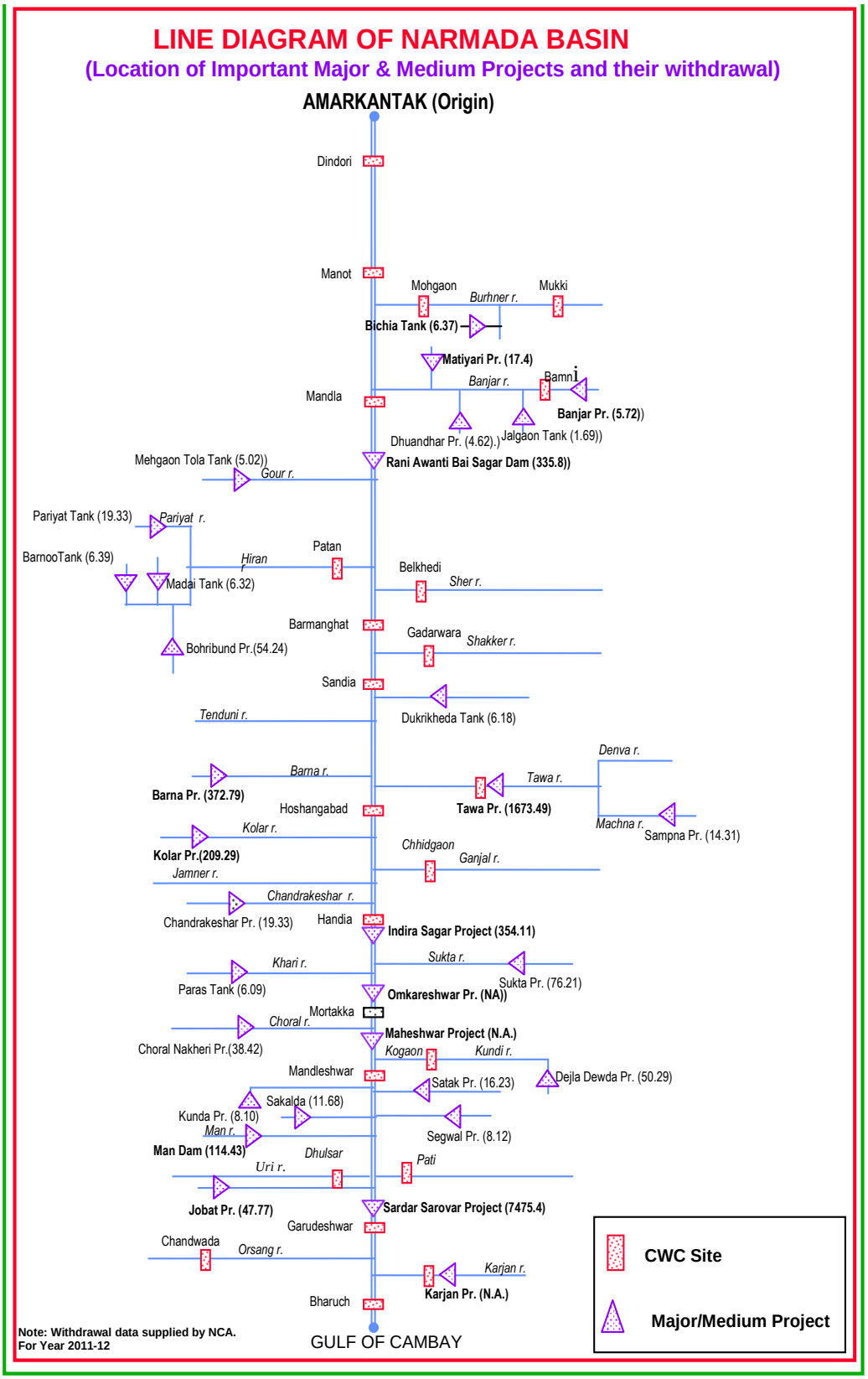


Figure 2-2 Line Diagram of Narmada Basin (Location of Major & Medium Projects and their Withdrawal)

Note: Withdrawal in case of Bargi, I.S.P., O.S.P & S.S.P consists of utilisation for irrigation through canals in addition to spillway/power house release. Figure in the bracket against the project shows the Withdrawal from project in MCM

New Hydrological Observation Stations Under Narmada Basin

S.N.	Name	River	Type - G/GD/GDS/GDSQ/GQ
1	Katangitola	Matiyarai	GD
2	Narayanganj	Balai	G
3	Singaldeep	Hiran	GD
4	Matamar	Pariyat	GD
5	Chargaon	Saner	GD
6	Ghunghara	Belkund	GD
7	Balwada	Gaur	G
8	Maalpur	Narmada	G
9	Gadasarai	Chkrar	GD
10	Gidha	Machrar	G
11	Kotrai	Silgi	GD
12	Baratola	Halon	G
13	Parasatola	Phen	G
14	Gorakhpur	Narmada	G
15	Maheshwar	Tenduni	GD
16	Barna Dam	Barna	G
17	Bakori	Machhrewa	GD
18	Panagar	Dudhi	GD
19	Sohagpur	Palakmati	GD
20	Matkuli	Denva	G
21	Imaliya	Umar	G
22	Naseerabad	Narmada	GD
23	Khapariya	Indra	GD
24	Kacchara	Sher	GD
25	Misrod	Hathed	GD
26	Sandalpur	Jamner	GD
27	Shahpur	Machna	GD
28	Dholpur	Sip	GD
29	Mahgaon	Kolar	GD
30	Awalighat	Narmada	G
31	Dudhwas	Datuni	GD
32	Barangi	Machak	GD

33	Bhamgarh	Chhota Tawa	GD
34	Charuwa	Kalimachak	GD
35	Veerpur	Kolar	G
36	Tawakathi	Tawa	GD
37	Dahiwar	Karam	GD
38	Thikri	Borad	GD
39	Gopalpura	Maan	GD
40	Indirasagar Dam	Narmada	G
41	Khajuri	Deb	GD
42	Khandwa	Abna	GD
43	Barwah	Choral	GD
44	Mendhikheda	Kaner	GD
45	Satwadi	Beda	GD

New Telemetry Stations Under Narmada Basin

S.N.	Name	River	Type - G/GD/GDS/GDSQ/GQ
1	Dindori	Narmada	GD
2	Manot	Narmada	G
3	Mohgaon	Burhner	GD
4	Mukki	Banjar	GD
5	Mandla	Narmada	GD
6	Patan	Hiran	GD
7	Mawai		G
8	Barginagar	Narmada	G
9	Barmanghat	Narmada	GD
10	Sandia	Narmada	G
11	Pachmarhi	Narmada	GD
12	Hoshangabad	Narmada	G
13	Tawa Nagar	Tawa	G

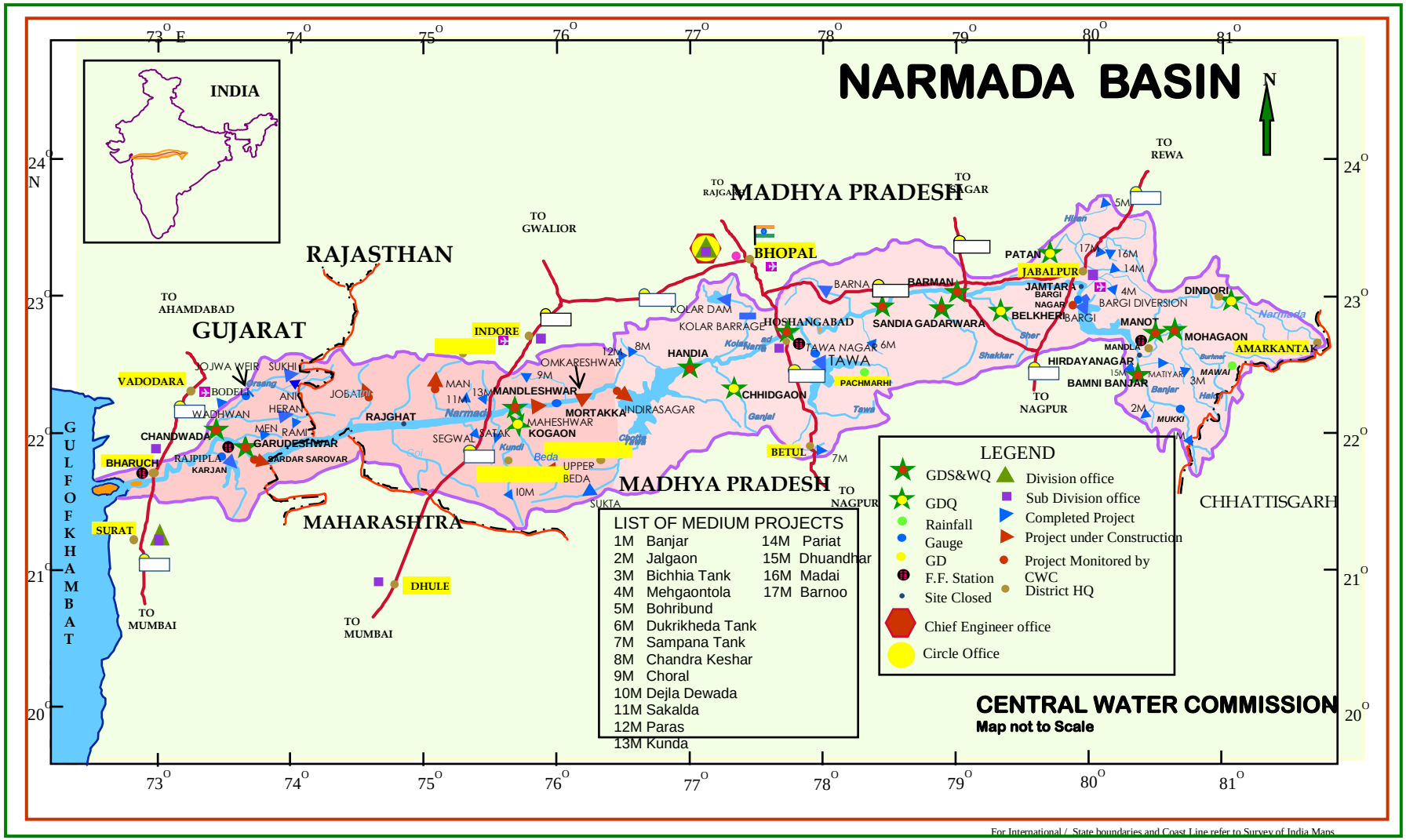


Figure 2-3 Narmada Basin

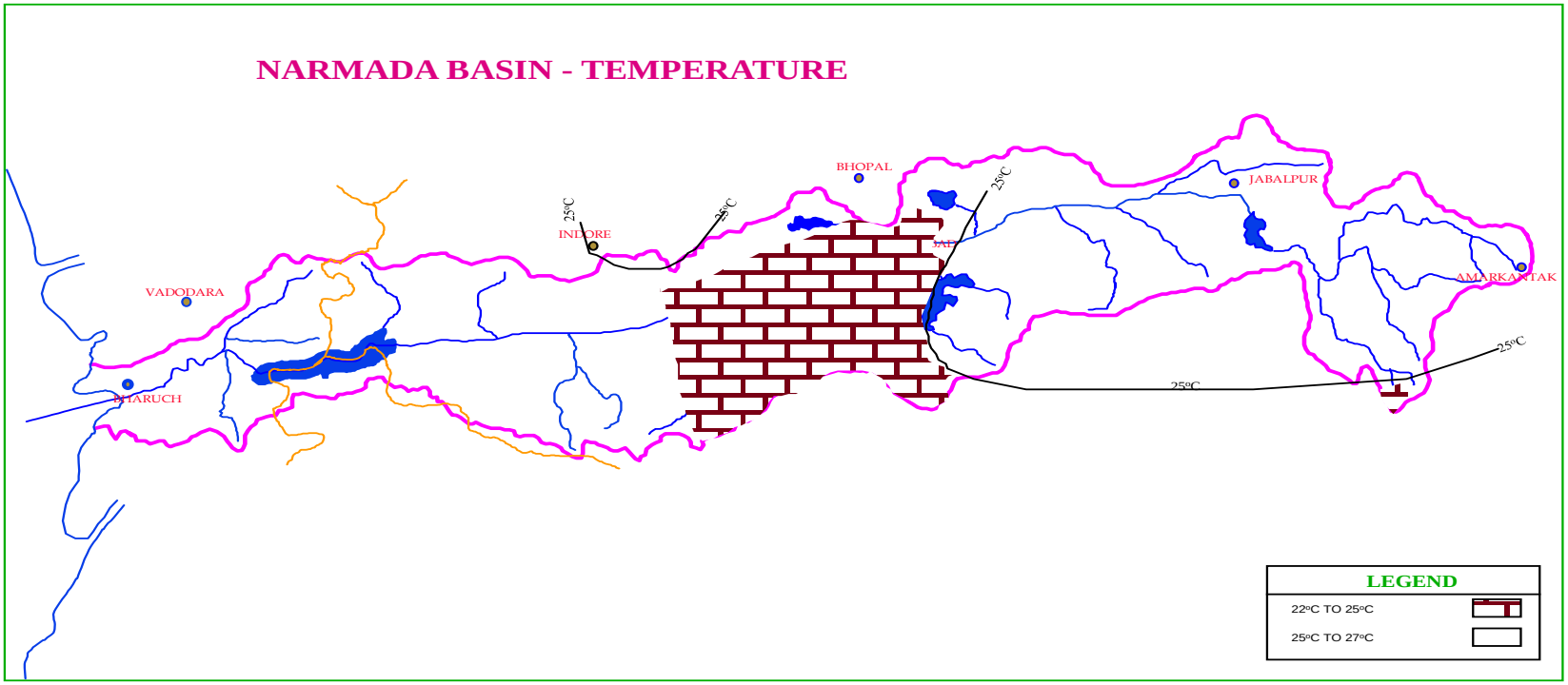


Figure 2-4 Narmada Basin - Temperature

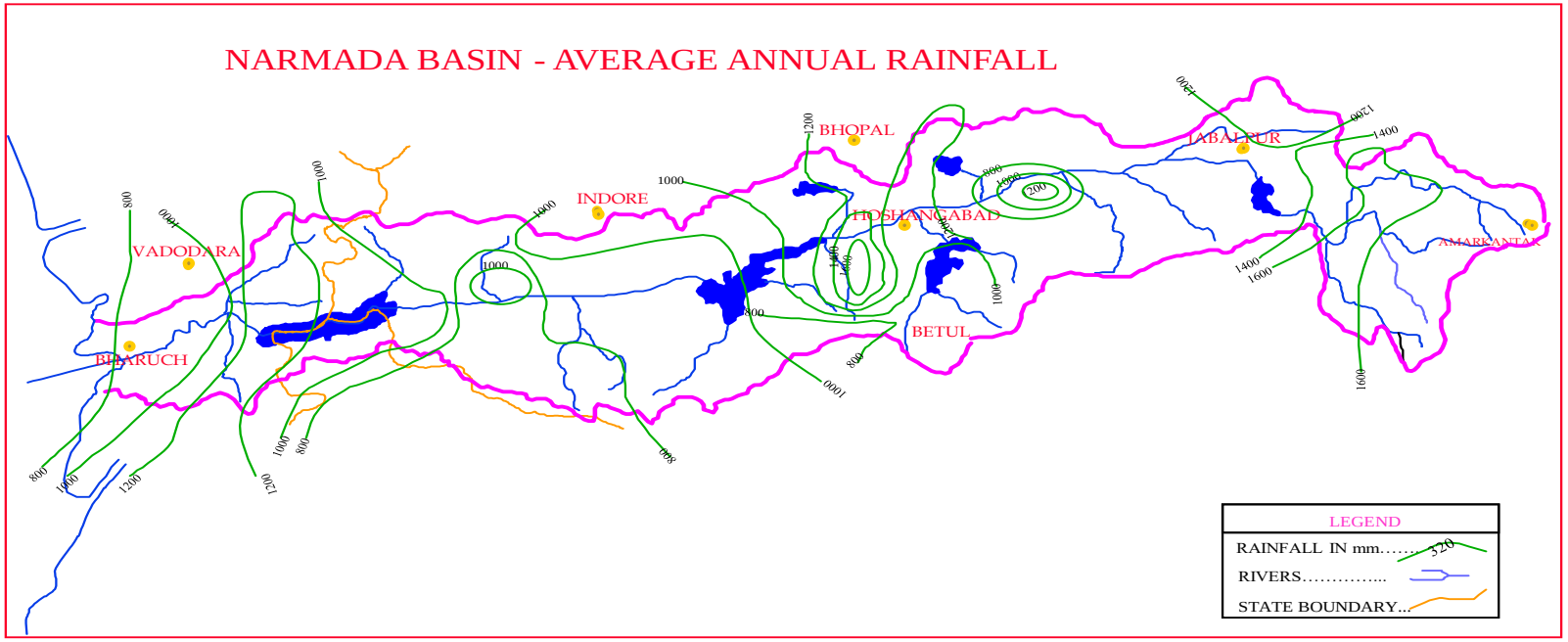


Figure 2-5 Narmada Basin – Average Annual Rainfall

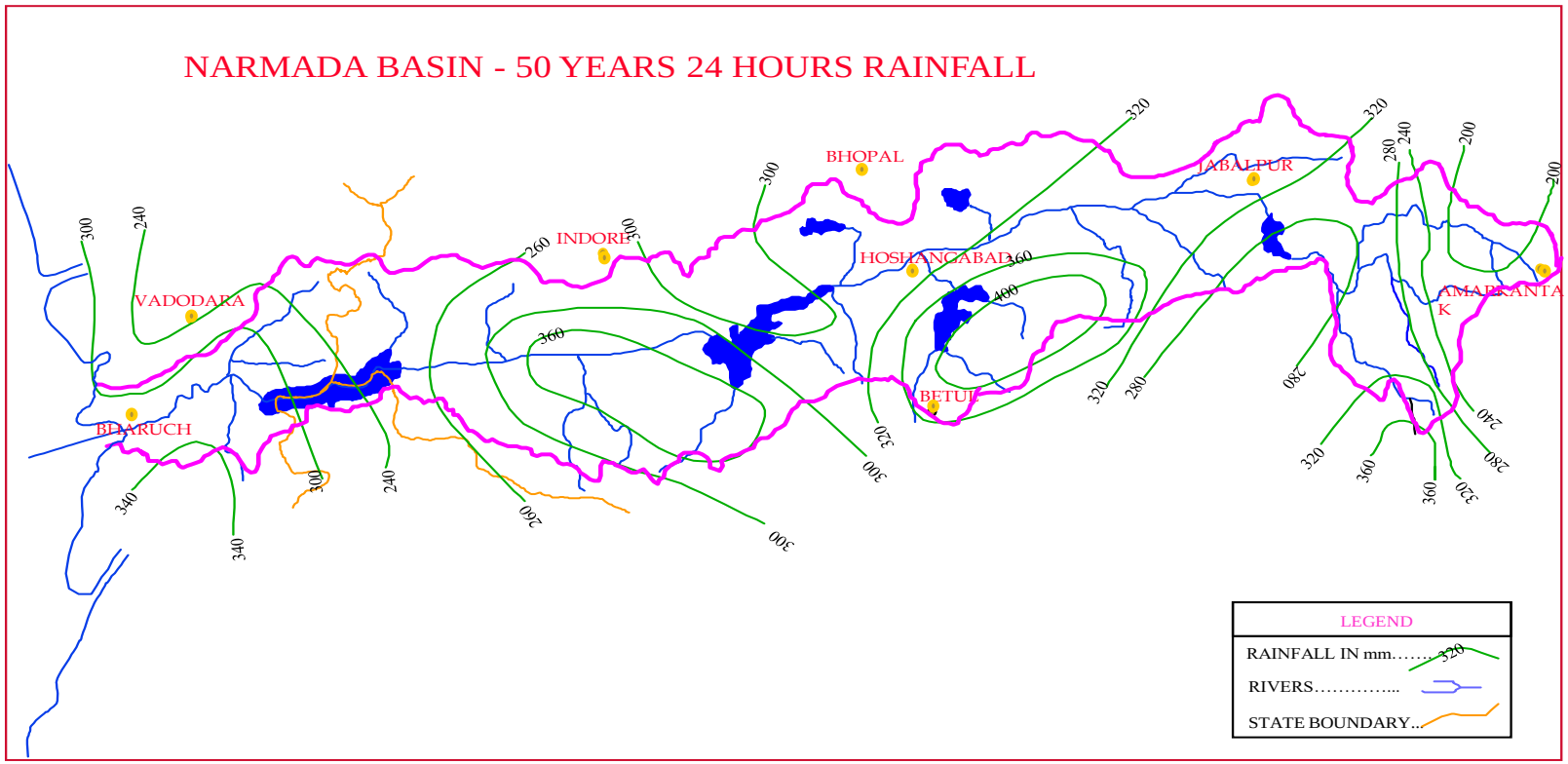


Figure 2-6 Narmada Basin – 50 Years 24 Hours Rainfall

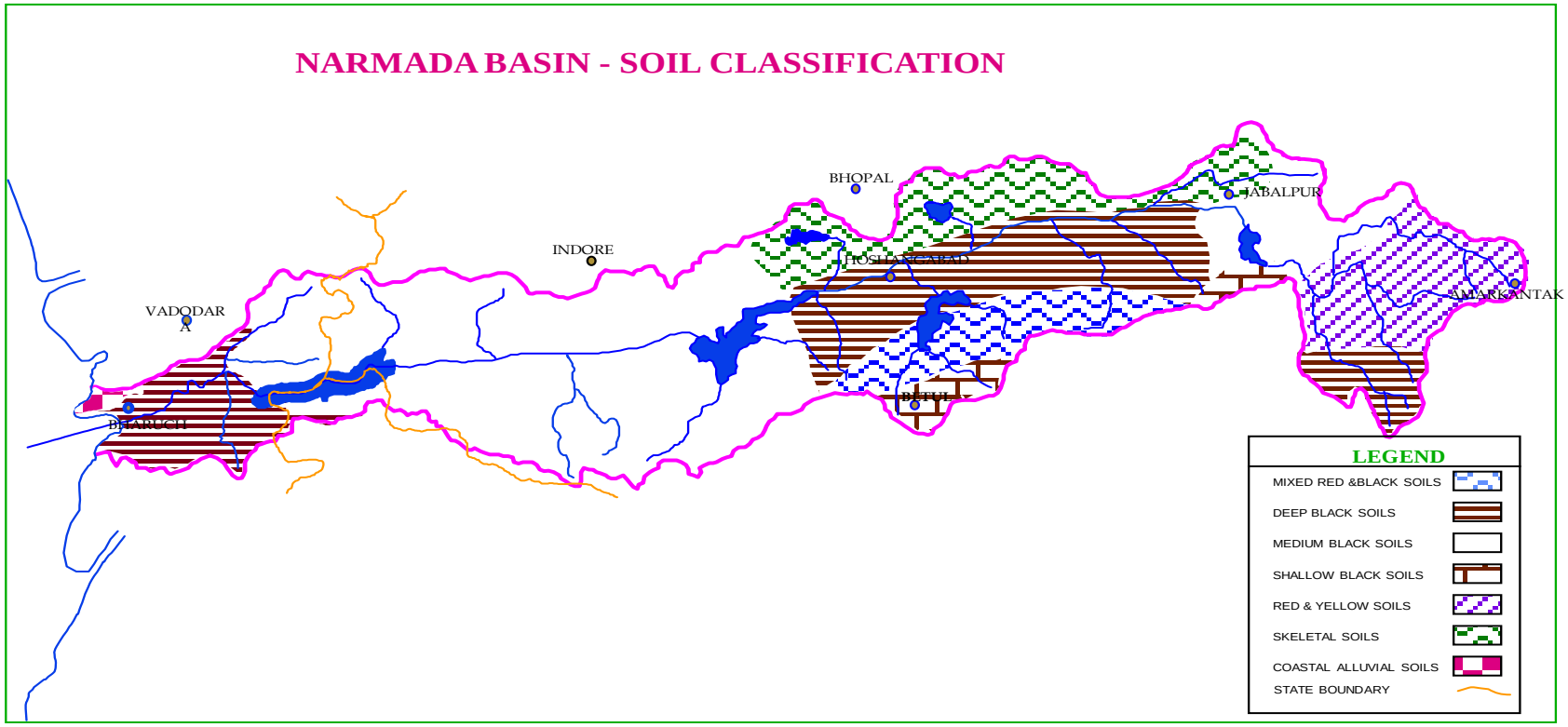


Figure 2-7 Narmada Basin – Soil Classification

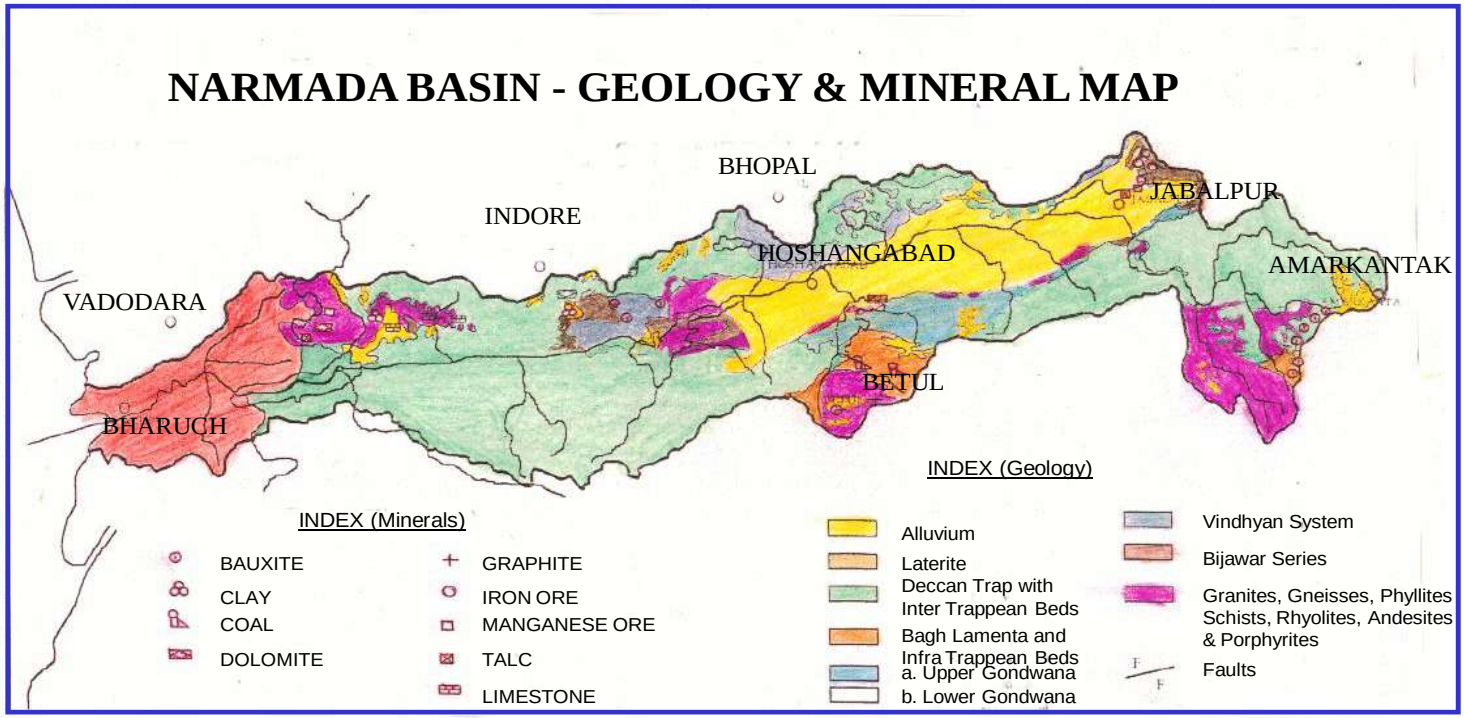


Figure 2-8 Narmada Basin – Geology & Mineral Map

3 Stream Flow Data

3.1 Methodology

3.1.1 Gauge Measurement

Water level or stage of river is measured as its elevation above the G.T.S. datum. Water level measurement is conducted by reading non-recording gauges as specified in IS 4080-1967. Series of vertical staff gauges have been fixed at three sections at every site. The gauge posts are generally of wood or concrete with cut and ease water arrangement and fixed securely in vertical position by anchoring them in M-15 concrete base of suitable size. Enamelled vertical gauge plates with metric markings are fixed on the gauge posts so that the gauges can be read up to 0.005 m.

Out of the three gauge lines the Central one is used as Station Gauge line and the readings of other two gauge lines are used for calculation of water surface slope. During non-monsoon season, gauges are read thrice daily (0800, 1300 and 1800 hrs) and during monsoon, gauges are read hourly at the station gauge line.

3.1.2 Discharge Observations

Discharge is observed once a day starting from 0800 hrs at all the sites by area velocity method except on Sundays and holidays. For non-observation days, the discharge values are computed from the Stage and Discharge relation prepared from the observed data for the water year 2017-18.

The stream width is divided into 15 to 25 segments based on the degree of accuracy as outlined in IS 1192-1981. The width of the river is measured by steel tape/ metallic tape or wire/nylon rope stretched across the river with markings indicated there on, when the river width and depth permitted wading. For large width and deep flow conditions segmentation is done using simple trigonometric method for which pivot point and segment blocks have been constructed at each site.

The depth is measured by using sounding rod 3 to 6 metre long adopting specifications given in IS 3912-1966. When the river flow is very deep and swift, lead lines/ echo sounders are used. Necessary Airline correction and Wet line corrections are made to the sounding observation as provided in IS 1192-1981. The velocity is measured as per IS 3918-1966 by using a cup type current meter conforming to specifications given in IS 3910-1966. The current meter is lowered at the requisite depth (0.6d) vertically at every segment by suspension arrangement as specified in IS 6064-1971. In high velocities, boats fitted with power engines or motor launches are used. Drift is measured and correction for the same is made. Where observations by boat or launch are not possible, measurement of velocity is conducted from bridge or cableway.

When the above procedures are not possible then velocity is measured by float observations. The observations are recorded in a standard format for calculation of total river flow.

3.2 Data Availability

Data availability at various sites in Narmada basin is given in **Table 3-1**.

Table 3-1 Data Availability at CWC Sites

Sl. No.	Station Name	Type	Data Available		Station code No.
			From (Year)	To (Year)	
1	Narmada at Dindori	G/D/Q	88/88/90	2018	01 02 15 001
2	Narmada at Manot	G/D/S/Q	76/76/79/80	2018	01 02 15 002
3	Narmada at Aamgaon	G/D	99/01	2006	NCA
3	Burhner at Mohgaon	G/D/S/Q	77/77/92/86	2018	01 02 15 004
4	Banjar at Bamni	G/D	99/99	2018	-
5	Banjar at Mukki	G	88	2018	01 02 15 005
6	Banjar at Hirdayanagar	G/D/S/Q	76/76/92/86	2002	01 02 15 006
7	Narmada at Mandla	G	75	2018	01 02 15 007
8	Narmada at Jamtara	G/D/S/Q	71/72/72/79	2001	01 02 15 008
9	Hiran at Patan	G/D/Q	79/79/86	2018	01 02 15 009
10	Sher at Belkheri	G/D/Q	77/77/86	2018	01 02 15 010
11	Narmada at Barmanghat	G/D/S/Q	70/71/72/79	2018	01 02 15 011
12	Shakkar at Gadarwara	GDSQ	77/77/78/79	2018	01 02 15 012
13	Narmada at Sandia	G/D/S/Q/R	78/78/78/79	2018	01 02 15 013
14	Tendoni at Maheshwar	G/D	84/84	1993	01 02 15 014
15	Barna at Bareli	G/D	84/84	1993	01 02 15 015
16	Tawa at Tawa Dam	G	74	2018	01 02 15 017
17	Tawa at Manegaon	G/D/Q	76 /76/76	1991	01 02 15 018
18	Tawa at Tawakati	G/D	99/01	2006	NCA
19	Machna at Shahpur	G/D	99/00	2006	NCA
20	Narmada at Hoshangabad	G/D/S/Q	72/72/72/79	2018	01 02 15 019
21	Ganjal at Chhidgaon	G/D/Q	76/76/86	2018	01 02 15 020
22	Jamner at Sandalpur	G/D	87/87	1993	01 02 15 021
23	Narmada at Handia	G/D/S/Q	77/77/77/79	2018	01 02 15 022

Sl. No.	Station Name	Type	Data Available		Station code No.
			From (Year)	To (Year)	
24	Chhota tawa at Ginnore	G/D/Q	71/71/72/79	1999	01 02 15 023
25	Narmada at Mortakka	G/D/Q	99/99/99	2015/2007/2007	01 02 15 024
26	Kundi at Kogaon	G/D/Q	78/78/86	2018	01 02 15 025
27	Narmada at Mandleshwar	G/D/S/Q	70/71/72/79	2018	01 02 15 026
28	Man at Ajandiman	G/D	84/84	1993	01 02 15 027
29	Narmada at Rajghat	G/D/S/Q	71/72/72/79	2007	01 02 15 028
30	Uri at Dhulsar	G/D	99/99	2017	NCA
31	Goi at Pati	G/D	99/99	2017	NCA
32	Hathni at Jobat	G/D	2000	2006	NCA
33	Hathni at Tikola	G/D	84/84	2002	01 02 15 029
34	Narmada at Garudeshwar	G/D/S/Q	71/72/73/77	2018	01 02 15 030
35	Orsang at Chandwada	G/D/S/Q	79/79/88/80	2018	01 02 15 032

3.2.1 Explanatory Notes

The explanatory notes given here under are designed to assist in the interpretation of hydrological parameters contained in the data presented. The notes are therefore applicable in so far as the data presented in this book.

1. Water year covers the period from June 1st of one calendar year to May 31st of the next calendar year and covers one complete hydrological cycle.

2. Discharge is given in cubic metre per second.

3. Discharges given are actual observed/computed discharges.

4. The zero of gauge is datum level/R.L. fixed for a given site, which is kept 1 m or 2 m lower than the lowest water level recorded in a perennial stream. In a non-perennial stream it is kept 1 or 2 m lower than the lowest bed level of the stream.

5. Maximum and minimum discharges are taken from the daily observed flows.

6. Runoff in "mm" is the notional depth of water in millimetres over the catchment area equivalent to annual runoff calculated at the discharge measurement station. It is computed using the relation.

$$Runoff\ (mm) = \frac{Annual\ flow\ (hm^3)}{Catchment\ area\ (km^2)}\ X\ 100$$

7. Peak and lowest flow correspond to the highest and lowest water levels recorded during the period of record.

8. Measuring authority refers to the field Division responsible for the operation of the gauging station.

9. The gauging station code number is a unique nine column numeric reference number which facilitates storage and retrieval of flow data in data banks. The first two columns are identifier of measuring authority. Third and fourth columns are for zone/basin. Fifth and sixth columns are for independent river and last three i.e. seventh, eighth and ninth columns are for station numbers.

10. The month and the year from which data are available in the data bank is indicated in **Table 3-1**. .

3.2.2 Method of Presentation

The data presented in this book are processed discharge data obtained from application of SWDES and e-SWIS.

In the following pages, station wise hydrological data are presented comprising history sheet, daily flow table and pictorial summary. The sequence of hydrological stations is arranged from its origin to its outfall giving inter-priority to an intermediate tributary station in a similar fashion.

History sheets give concise description of the hydrological station. The flow tables present daily observed flows together with 10 daily, monthly and annual summaries. The pictorial summary shows monthly hydrograph of the current year for each individual gauging station which is superimposed on the corresponding maximum, minimum and mean values for the period of record i.e. up to the previous year. Thus maximum represents monthly maximum average discharge, minimum represents monthly minimum average discharge and mean represents mean of the 10 daily average discharges for the period of past record. The period of data considered is from inception of the site to the previous water year. Flow below 0.1 cumec is not represented in the pictorial summary because log scale has been used for plotting hydrographs.

The hydrological data presented here mainly consists of the following :

1 **History sheet**: It mainly consists of some salient features of the particular site as its location ,its drainage area, tributary, opening dates and the maximum and minimum discharge values and their corresponding water levels with the exact dates of their occurrence.

2 **Stage discharge curve**: It gives a relationship between the stage of the river at agiven time and the coresponding discharge.

3 **Stage discharge sheet**: It consists of the stage-dischargedata (both observed and that calculated from the stage discharge curve) for all the days of the current water year, peak observed and computed discharge, lowest observed discharge and the total runoff for the current water year.

4 **Histogram hydrograph**: It is a discharge –time graph which shows the mean monthly discharge based on the historical data ,mean monthly discharge for the current water year, minimum and maximum discharge base on the historical data.

5 **Annual Runoff**: It gives the values of the annual runoff (in MCM) for all the years from the opening of the site upto the current year.

6 **Monthly Average Runoff:** This chart shows the monthwise distribution of runoff based on the historical data of the site.

7 **Monthly Runoff:** This chart shows the monthwise distribution of runoff for the current water year.

8 **Pre-Monsoon & Post-Monsoon X-Section for Water Year :** It gives the pre-monsoon & post-monsoon cross sectional profile of the river ,maximum and minimum water levels occurred during the current year with the date of their occurrence.

9 **Water Level vs. Time - Graph** of Highest Flood Peak during the current Year

10 **Water Level vs. Time - Graph** of 2ndHighest Flood Peak during the current Year

11 **Water Level vs. Time - Graph** of 3rdHighest Flood Peak during the current Year

4 Hydrological Data

In the following pages, station wise hydrological data are presented comprising history sheet, daily flow table and pictorial summary. The sequence of hydrological stations is arranged from its outfall to its origin giving inter-priority to an intermediate tributary station in a similar fashion. Data of following stations are given in the following pages

- **Orsang at Chandwada**
- **Narmada at Garudeshwar**
- **Goi at Pati**
- **Uri at Dhulsar**
- **Narmada at Mandleshwar**
- **Kundi at Kogaon**
- **Narmada at Handia**
- **Ganjal at Chhidgaon**
- **Narmada at Hoshangabad**
- **Narmada at Sandia**
- **Shakkar at Gadarwara**
- **Narmada at Barmanghat**
- **Sher at Belkheri**
- **Hiran at Patan**
- **Banjar at Bamni**
- **Burhner at Mohgaon**
- **Narmada at Manot**
- **Narmada at Dindori**
- **Narmada at Bijora**

4.1 Orsang at Chandwada

History Sheet

HISTORY SHEET (DISCHARGE AND WATER LEVEL)

			Water Year	:	2017 - 2018
Site	:	CHANWADA	**Code**	:	006-TDSURAT
State	:	Gujarat	**District**	:	Vadodara
Basin	:	NARMADA	**Independent River**	:	Narmada
Tributary	:	Orsang	**Sub Tributary**	:	-
Sub-Sub Tributary	:	-	**Local River**	:	Orsang
Division	:	Executive Engineer, Tapi Division, Surat	**Sub-Division**	:	Lower Narmada Sub-Division, Bharuch
Drainage Area	:	3846.0 Sq. Km.	**Bank**	:	
Latitude	:	22°3'0''	**Longitude**	:	73°27'55''
Current Zero of Gauge (m)	:	18			

CATEGORY		Opening Date	Closing Date
Gauge	:		
Discharge	:		
Sediment	:		
Water Quality	:		

Reduced Level	Opening Date	Closing Date
18.0	29/12/2016	-
18.0	03/06/2014	29/12/2016
18.0	10/01/1979	03/06/2014

Annual Maximum / Minimum discharge with corresponding Water Level (m.s.l)

	Maximum			Minimum		
Year	Q (cumecs)	WL (m)	Date	Q (cumecs)	WL (m)	Date
1979-1980	63.6	21.785	22/11/1979	0	0	03/07/1979
1980-1981	1128	23.35	23/08/1980	0.1	20.02	28/01/1981
1981-1982	7824	29.2	10/08/1981	0.1	19.47	30/03/1982
1982-1983	1210.1	23.585	17/08/1982	0.1	19.55	07/06/1982
1983-1984	4080	27.6	18/08/1983	0.1	19.89	16/03/1984
1984-1985	5000	28.86	20/08/1984	0.1	19.945	10/03/1985
1985-1986	970	23.165	06/08/1985	0.1	20.02	04/10/1985
1986-1987	585	25.2	16/08/1986	0.1	20.058	23/07/1986
1987-1988	750	23.5	25/08/1987	0.02	20.145	01/08/1987
1988-1989	4650	27.2	04/08/1988	0.1	0	15/06/1988
1989-1990	4100	26.95	20/08/1989	0.05	0	31/10/1989
1990-1991	8900	33.45	24/08/1990	0	19.605	30/06/1990
1991-1992	1890	24.3	31/07/1991	0.05	19.57	10/07/1991
1992-1993	1600	24	07/09/1992	0.28	19.44	30/11/1992
1993-1994	2475	25.5	17/07/1993	0.01	19.285	09/11/1993
1994-1995	9070	33.55	07/09/1994	0.05	19.18	07/03/1995
1995-1996	1265	23.6	03/09/1995	0.1	19.29	06/11/1995
1996-1997	4600	29	27/07/1996	0	18.99	04/01/1997
1997-1998	4360	28.9	01/08/1997	0	18.92	08/02/1998
1998-1999	2600	30	16/09/1998	0	18.95	02/02/1999
1999-2000	1675	25.94	22/09/1999	0.03	18.63	04/09/1999
2000-2001	255	20.4	14/07/2000	0.01	18.8	31/08/2000
2001-2002	2790	23.8	05/08/2001	0.02	18.56	05/10/2001
2002-2003	2420	26.8	04/09/2002	0.01	18.64	29/10/2002
2003-2004	2050	25.5	25/06/2003	0.25	18.85	09/12/2003
2004-2005	4800	28.8	14/08/2004	0.36	18.65	03/07/2004
2005-2006	2379.72	23.2	04/07/2005	1.61	18.17	29/06/2005
2006-2007	6125.55	31.2	07/08/2006	0.92	18.655	03/07/2006
2007-2008	4085.92	27	02/07/2007	1.61	18.17	29/06/2007
2008-2009	2135.29	23.2	12/08/2008	1.27	18.43	25/07/2008
2009-2010	779.8	20.8	30/08/2009	0	18.28	04/11/2009
2010-2011	2068.97	23.35	05/08/2010	0	0	28/12/2010
2011-2012	979.68	22.325	09/08/2011	0	0	20/06/2011
2012-2013	2726.26	25	07/09/2012	0	0	22/06/2012
2013-2014	3665.13	26.8	24/09/2013	0.81	18.04	31/05/2014
2014-2015	1425.74	22.8	09/09/2014	0	0	25/06/2014
2015-2016	470.64	20.7	28/07/2015	0	0	04/02/2016
2016-2017	475.18	19.6	11/08/2016	0	18.01	03/01/2017
2017-2018	172.82	18.95	30/08/2017	0	0	01/06/2017

Stage Discharge Sheet for Orsang at Chandwada for the period 2017-18

Day	June		July		August		September		October		November	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	0	0	0.00	17.64	25.04	18.3	115.51	18.3	0	0	0.00	17.64
2	0	0	0.00	17.65	24.4	18.17	114.45	18.10	0	0	0.00	17.65
3	0	0	6.38	17.64	39.37	18.13	113.10	18.50	0	0	6.38	17.64
4	0	0	7.78	18.26	35.99	18.1	112.46	18.25	0	0	7.78	18.26
5	0	0	0.00	18.1	35.91	18.09	94.08	18.24	0	0	0.00	18.1
6	0	0	0.00	18.02	35.45	18.04	102.84	18.23	0	0	0.00	18.02
7	0	0	0.00	18.01	32.18	18.03	50.87	18.22	0	0	0.00	18.01
8	0	0	0.00	18.00	31.24	18.02	51.25	18.22	0	0	0.00	18.00
9	0	0	0.00	18.00	30.32	18.01	47.39	18.18	0	0	0.00	18.00
10	0	0	0.00	18.00	29.59	36	46.25	18.10	0	0	0.00	18.00
11	0	0	0.00	18.00	29.45	36	50.05	18.2	0	0	0.00	18.00
12	2.3	18.28	0.00	18.00	29.45	36	51.3	18.21	2.3	18.28	0.00	18.00
13	2.3	18.28	0.00	18.00	29.45	36.00	52.6	18.17	2.3	18.28	0.00	18.00
14	2.43	18.28	0.00	18.02	19.46	35.98	135.04	18.38	2.43	18.28	0.00	18.02
15	1.81	18.14	0.00	18.20	18.29	35.97	131.61	18.4	1.81	18.14	0.00	18.20
16	1.74	17.75	0.00	18.37	18.89	35.97	60.8	18.27	1.74	17.75	0.00	18.37
17	1.64	17.72	15.67	18.25	16.6	35.97	55.45	18.30	1.64	17.72	15.67	18.25
18	1.23	17.29	22.05	18.5	15.43	35.95	51.92	18.22	1.23	17.29	22.05	18.5
19	1.23	17.29	14.79	18.18	15.06	35.94	59.18	18.26	1.23	17.29	14.79	18.18
20	1.58	17.65	13.76	18.11	29.88	36.00	55.37	18.24	1.58	17.65	13.76	18.11
21	1.26	17.37	12.94	18.05	29.88	36	54.4	18.23	1.26	17.37	12.94	18.05
22	0	17.37	15.28	18.22	141.05	36.95	59.57	18.27	0	17.37	15.28	18.22
23	0	17.38	15.95	18.34	51.88	18.25	53.08	18.22	0	17.38	15.95	18.34
24	0	17.37	24.30	18.55	45.14	18.18	42.05	18.19	0	17.37	24.30	18.55
25	0	17.37	20.81	18.14	37.78	18.06	38.6	18.16	0	17.37	20.81	18.14
26	0	17.86	23.39	18.42	37.78	18.06	36.65	18.14	0	17.86	23.39	18.42
27	0	17.75	24.28	18.46	100.15	18.07	32.69	18.15	0	17.75	24.28	18.46
28	0	17.7	23.14	18.41	136.88	18.8	33.43	18.16	0	17.7	23.14	18.41
29	0	17.66	27.24	18.6	127.45	18.5	21.73	18.14	0	17.66	27.24	18.6
30	0	17.65	27.10	18.40	172.82	18.95	21.73	18.14	0	17.65	27.10	18.40
31			27.57	18.33	123.7	18.35					27.57	18.33
Ten-Daily Mean												
I Ten-Daily	0	0	1.05	3.64	28.4	18.09	57.44	12.76	0	0	1.05	3.64
II Ten-Daily	1.5	14.34	7.41	7.3	14.43	25.18	64.79	16.43	1.5	14.34	7.41	7.3
III Ten-Daily	0.13	17.55	19.95	15.02	78.78	18.37	33.02	14.55	0.13	17.55	19.95	15.02
Min.												
Max.	0	0	4.75	18.05	15.06	18.01	21.73	18.14	0	0	4.75	18.05
Mean	2.43	18.28	30.94	18.6	172.82	36.95	135.04	18.4	2.43	18.28	30.94	18.6

Annual Runoff in MCM :

Peak Observed Discharge = 172.82 cumecs on 30/8/2017 Corres. Water Level 18.95 m

Lowest Observed Discharge = 0cumecs on 1/6/2017 Corres. Water Level 0 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m
***:Computed Discharge**
#:Discarded Discharge (values changed as per rating curve)

Stage Discharge Sheet for Orsang at Chandwada for the period 2017-18

Day	December		January		February		March		April		May	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	1.57	18.08	0	18.01	0	0	0	0	0	0	0	0
2	1.56	18.08	0	18.01	0	0	0	0	0	0	0	0
3	1.56	18.08	0	18.01	0	0	0	0	0	0	0	0
4	1.15	18.08	0	0	0	0	0	0	0	0	0	0
5	0.76	18.07	0	0	0	0	0	0	0	0	0	0
6	0.75	18.07	0	0	0	0	0	0	0	0	0	0
7	0.75	18.07	0	0	0	0	0	0	0	0	0	0
8	0.74	18.07	0	0	0	0	0	0	0	0	0	0
9	0.74	18.07	0	0	0	0	0	0	0	0	0	0
10	0.72	18.07	0	0	0	0	0	0	0	0	0	0
11	0.72	18.07	0	0	0	0	0	0	0	0	0	0
12	0.72	18.07	0	0	0	0	0	0	0	0	0	0
13	0.73	18.07	0	0	0	0	0	0	0	0	0	0
14	0.73	18.07	0	0	0	0	0	0	0	0	0	0
15	0.73	18.07	0	0	0	0	0	0	0	0	0	0
16	0.73	18.07	0	0	0	0	0	0	0	0	0	0
17	0.75	18.06	0	0	0	0	0	0	0	0	0	0
18	0.72	18.06	0	0	0	0	0	0	0	0	0	0
19	0.7	18.04	0	0	0	0	0	0	0	0	0	0
20	0.69	18.04	0	0	0	0	0	0	0	0	0	0
21	0.68	18.03	0	0	0	0	0	0	0	0	0	0
22	0.68	18.03	0	0	0	0	0	0	0	0	0	0
23	0.07	18.03	0	0	0	0	0	0	0	0	0	0
24	0	18.02	0	0	0	0	0	0	0	0	0	0
25	0	18.02	0	0	0	0	0	0	0	0	0	0
26	0	18.02	0	0	0	0	0	0	0	0	0	0
27	0	18.02	0	0	0	0	0	0	0	0	0	0
28	0	18.02	0	0	0	0	0	0	0	0	0	0
29	0	18.02	0	0	0	0	0	0	0	0	0	0
30	0	18.02	0	0	0	0	0	0	0	0	0	0
31	0	18.02	0	0	0	0	0	0	0	0	0	0
Ten-Daily Mean												
I Ten-Daily	0.92	18.07	0	5.4	0	0	0	0	0	0	0	0
II Ten-Daily	0.51	18.06	0	0	0	0	0	0	0	0	0	0
III Ten-Daily	0.13	18.02	0	0	0	0	0	0	0	0	0	0
Monthly												
Min.	0.07	18.02	0	18.01	0	0	0	0	0	0	0	0
Max.	1.57	18.02	0	18.01	0	0	0	0	0	0	0	0
Mean	0.52	18.05	0	1.8	0	0	0	0	0	0	0	0

Annual Runoff in mm : 75.56

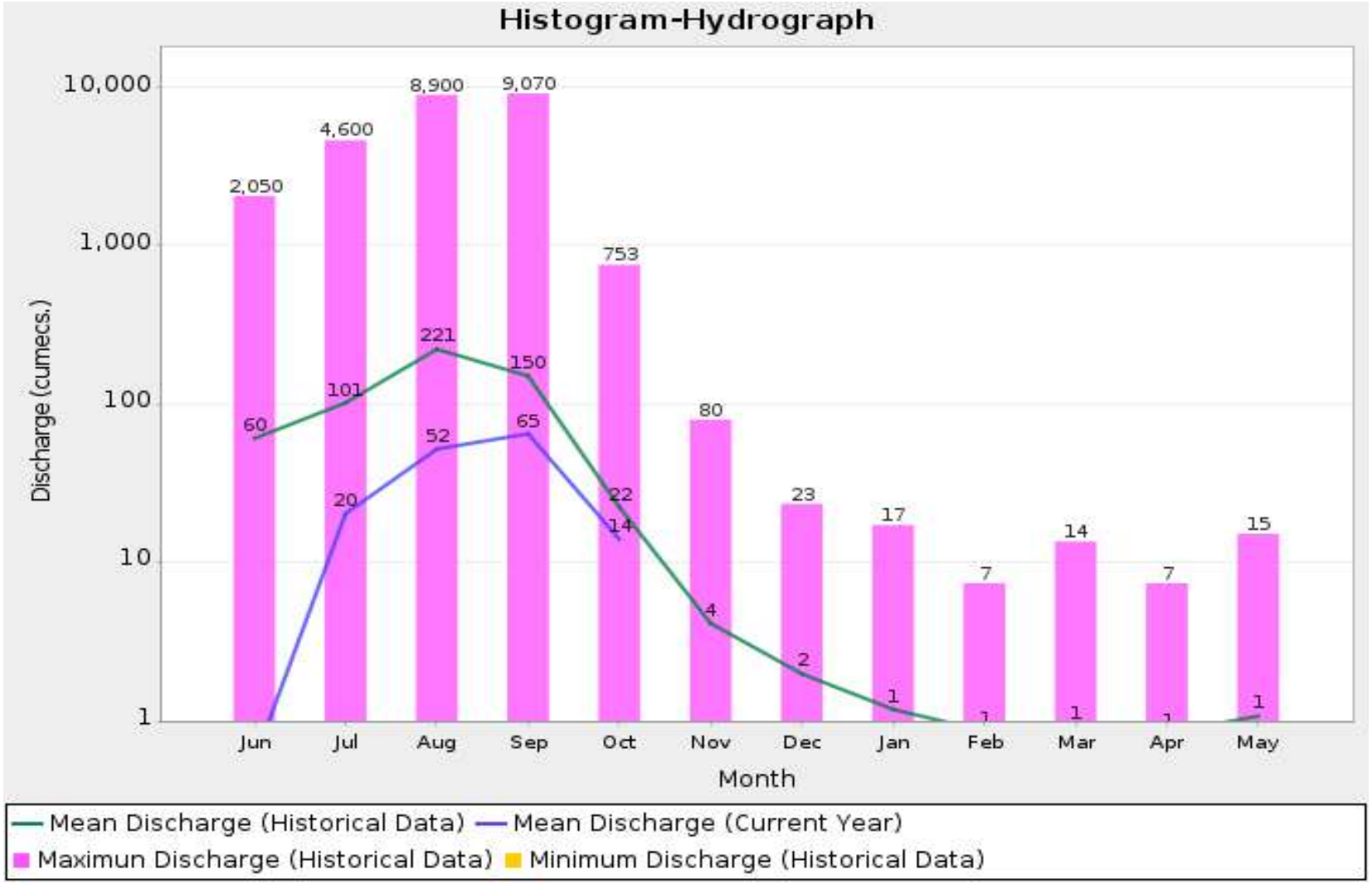
Peak Computed Discharge = 0 cumecs Corres. Water Level 0 m

Lowest Computed Discharge = 1000000cumecs Corres. Water Level 0 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge #:Discarded Discharge (values changed as per rating curve)

Note:Missing values ignored while arriving at Annual Runoff

Histogram - Hydrograph for Water Year: 2015-2016 (Data considered: 1981-2017)



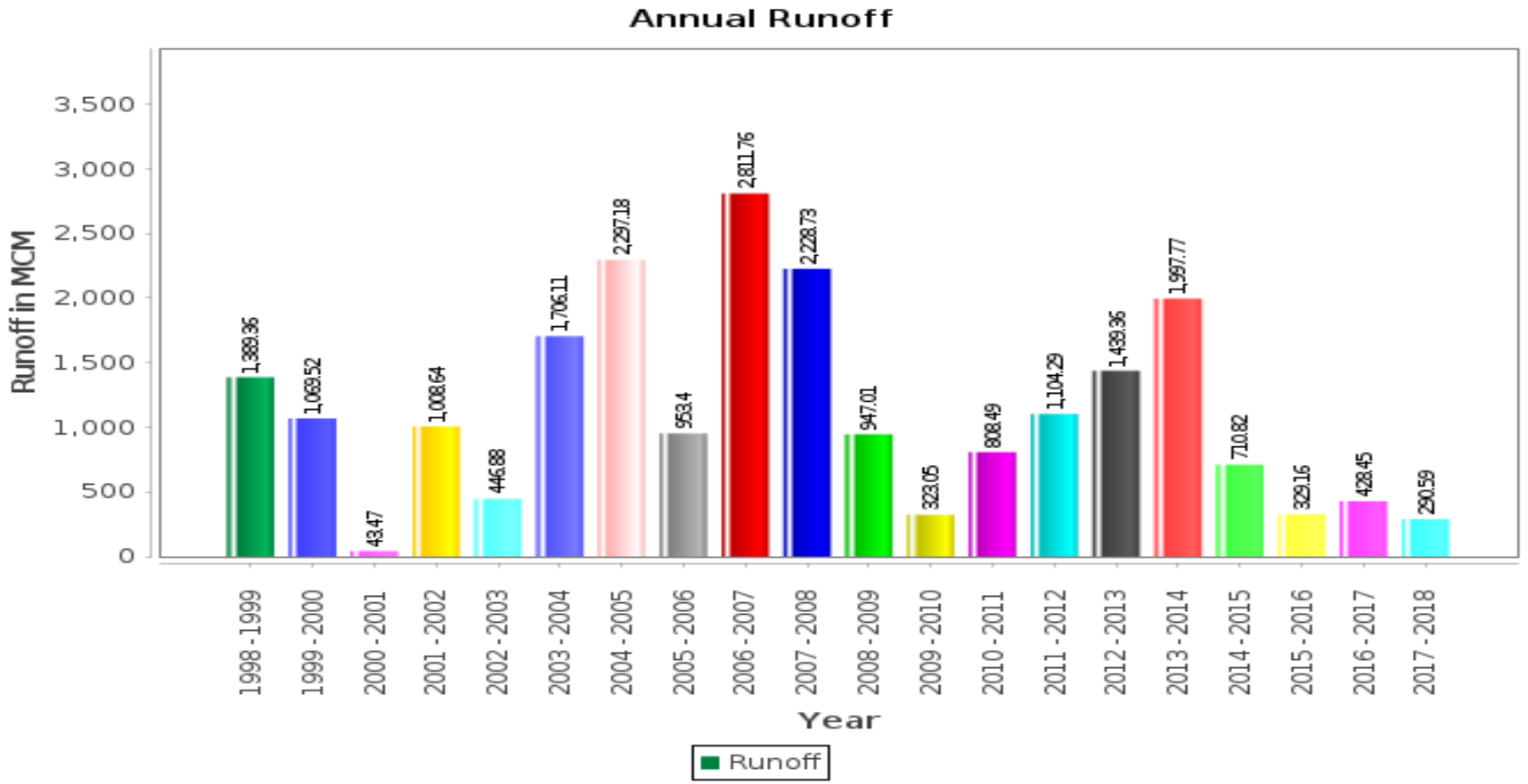
Annual Runoff Values for the period (1981 – 2018)

Station Name: Orsang at Chandwada (01 02 15 032)

Division: Tapi Division, Surat

Local River: Orsang

Sub-Division: LNSD, CWC Bharuch

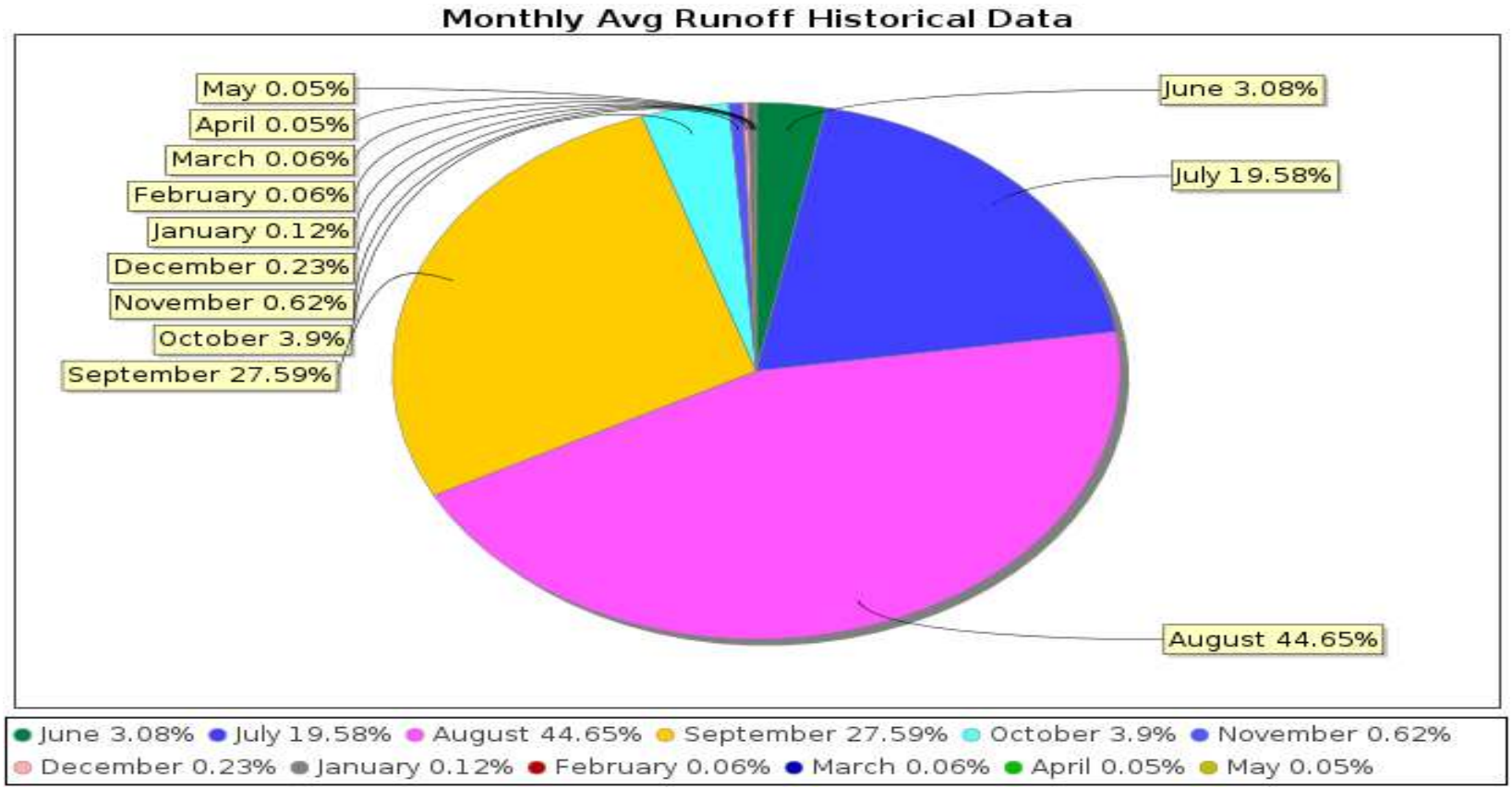


Note: Missing values have not been considered while arriving at Annual Runoff

Monthly Average Runoff based on period (1981 – 2018)

Station Name: Orsang at Chandwada (01 02 15 032) Division: Tapi Division, Surat

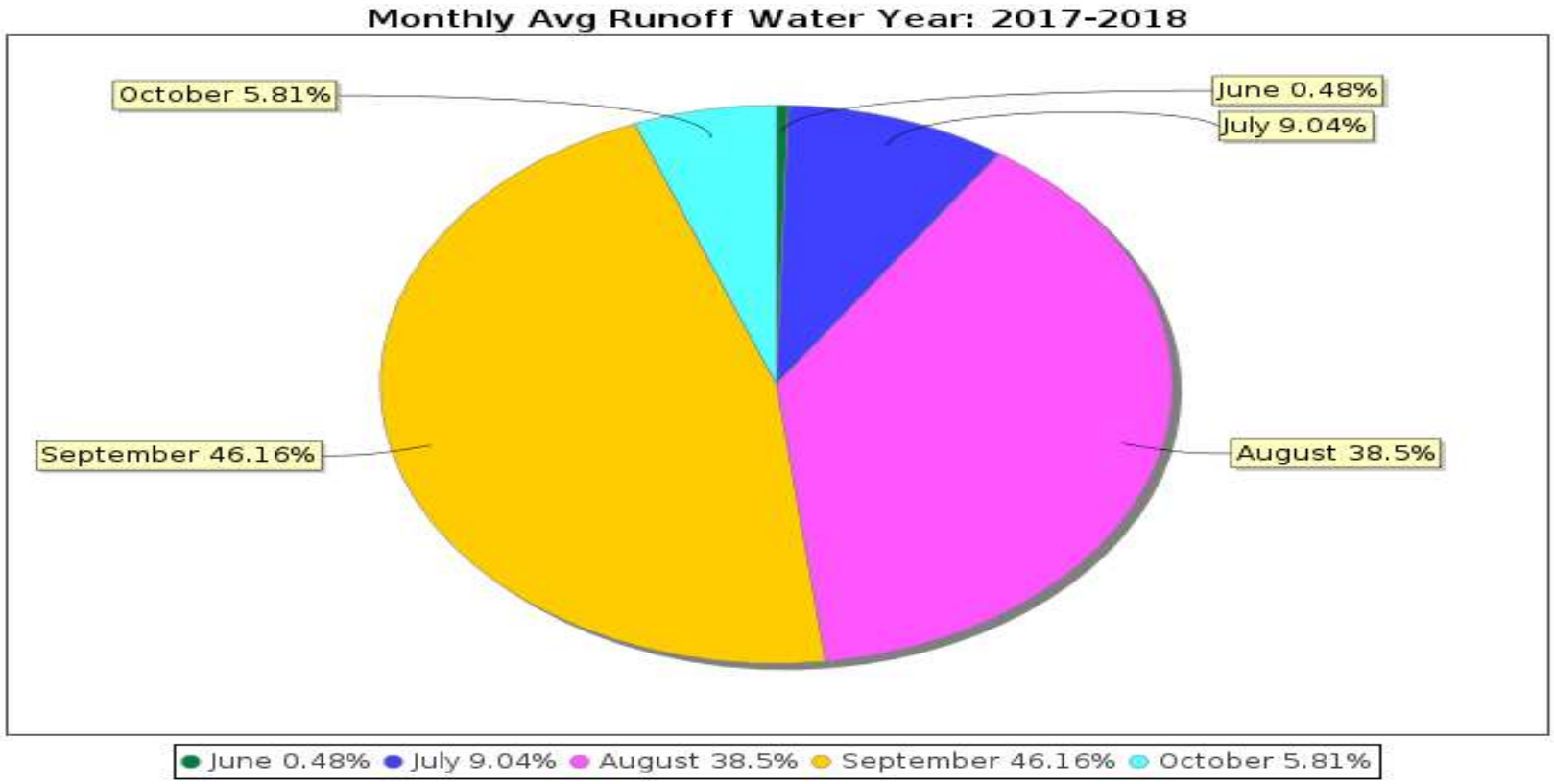
Local River: Orsang Sub-Division: LNSD, CWC Bharuch



Monthly Runoff for the Year (2016-2018)

Station Name: Orsang at Chandwada (01 02 15 032) Division: Tapi Division, Surat

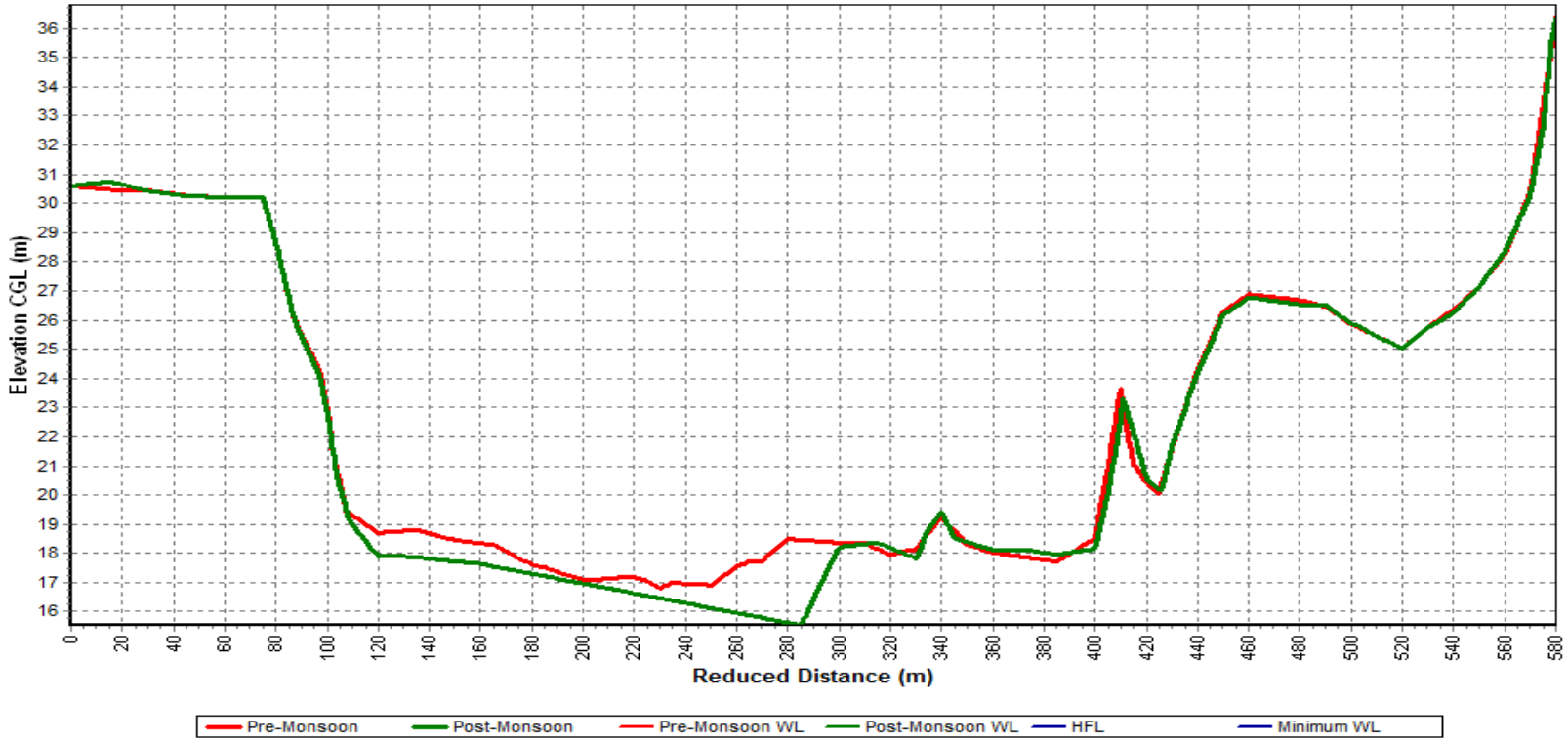
Local River: Orsang Sub-Division: LNSD, CWC Bharuch



Pre-Monsoon & Post-Monsoon X-Section for Water Year (2016-2018)

Station Name: Orsang at Chandwada (01 02 15 032) Division: Tapi Division, Surat

Local River: Orsang Sub-Division: LNSD, CWC Bharuch



4.2 Narmada at Garudeshwar

History Sheet

HISTORY SHEET (DISCHARGE AND WATER LEVEL)

			Water Year	:	2017 - 2018
Site	:	Garudeshwar	**Code**	:	003-TDSURAT
State	:	Gujarat	**District**	:	Narmada
Basin	:	NARMADA	**Independent River**	:	Narmada
Tributary	:	-	**Sub Tributary**	:	-
Sub-Sub Tributary	:	-	**Local River**	:	Narmada
Division	:	Executive Engineer, Tapi Division, Surat	**Sub-Division**	:	Lower Narmada Sub-Division, Bharuch
Drainage Area	:	null Sq. Km.	**Bank**	:	
Latitude	:	21°53'10''	**Longitude**	:	73°39'16''
Current Zero of Gauge (m)	:	10			

CATEGORY		Opening Date	Closing Date
Gauge	:		
Discharge	:		
Sediment	:		
Water Quality	:		

Reduced Level	Opening Date	Closing Date
10.0	22/12/1971	04/06/2014
10.0	31/05/2015	-
10.0	04/06/2014	31/05/2015

Annual Maximum / Minimum discharge with corresponding Water Level (m.s.l)						
	Maximum			Minimum		
Year	Q (cumecs)	WL (m)	Date	Q (cumecs)	WL (m)	Date
1971-1972	122.5	14.26	22/03/1972	24.5	14.145	24/05/1972
1972-1973	1085	16.625	24/09/1972	22.3	14.37	31/05/1973
1973-1974	40428.2	39.625	31/08/1973	21.7	14.365	04/06/1973
1974-1975	29904.8	32.195	21/08/1974	24	14.265	31/05/1975
1975-1976	30476.9	31.025	13/09/1975	23.2	14.273	03/06/1975
1976-1977	16374.5	26.49	05/08/1976	35.5	13.95	24/05/1977
1977-1978	24700	27.6	08/08/1977	30.3	14	09/06/1977
1978-1979	40745	34.212	30/08/1978	32.6	14.1	07/06/1978
1979-1980	27475	31.245	11/08/1979	14.6	14.3	31/05/1980
1980-1981	23138	28.1	31/08/1980	14.5	14.31	03/06/1980
1981-1982	22883.4	29.85	11/08/1981	24.7	14.305	16/06/1981
1982-1983	15722.4	25.803	24/08/1982	19.9	14.18	28/05/1983
1983-1984	18150	27.18	12/09/1983	19.1	14.15	01/06/1983
1984-1985	49500	35.88	20/08/1984	21.7	14.185	01/06/1984
1985-1986	14500	24.74	11/08/1985	11.5	14.45	22/03/1986
1986-1987	34700	31.01	16/08/1986	22	14.235	08/06/1986
1987-1988	10800	21.63	29/08/1987	16.2	14.01	24/05/1988
1988-1989	22600	27.27	05/08/1988	26.6	14.07	31/05/1989
1989-1990	14200	23.63	09/08/1989	26	14.02	04/06/1989
1990-1991	52000	36.1	24/08/1990	122	14.17	17/06/1990
1991-1992	22500	27.12	31/07/1991	66	13.73	27/04/1992
1992-1993	10150	22.1	19/08/1992	63.5	13.73	13/06/1992
1993-1994	20973	29.77	17/07/1993	19.17	13.62	25/02/1994
1994-1995	60642	39.78	07/09/1994	88	13.92	31/05/1995
1995-1996	11168	24.1	04/09/1995	44.21	13.81	29/06/1995
1996-1997	28200	33.1	28/07/1996	23.18	13.5	17/10/1996
1997-1998	21849	31.16	27/07/1997	107.2	13.84	23/06/1997
1998-1999	25600	33.8	16/09/1998	54.71	13.48	29/12/1998
1999-2000	23400	30.97	21/09/1999	85.23	13.78	14/06/1999
2000-2001	4460	18.68	01/08/2000	1.84	13.21	16/03/2001
2001-2002	8200	22.16	17/08/2001	5.98	13.58	29/04/2002
2002-2003	18250	29.39	04/09/2002	3.44	13.31	31/05/2003
2003-2004	9850	22.54	30/07/2003	2.88	13.35	27/12/2003
2004-2005	10550	23.5	26/08/2004	3.73	13.4	25/10/2004
2005-2006	7549.75	20.82	06/08/2005	5.54	13.51	11/06/2005
2006-2007	22226.45	31.2	07/08/2006	25.76	13.8	30/01/2007

2007-2008	10600.78	21.7	09/08/2007	1.28	13.64	03/02/2008
2008-2009	741.14	15.6	16/06/2008	16.92	13.71	16/10/2008
2009-2010	10684.21	22.97	12/09/2009	11.42	13.7	27/12/2009
2010-2011	4542.92	18.83	10/09/2010	2.15	13.72	29/06/2010
2011-2012	11631.56	25.6	28/08/2011	30.36	13.61	30/10/2011
2012-2013	26586.36	29.35	09/08/2012	17.38	13.44	03/03/2013
2013-2014	32056.75	34.56	25/08/2013	38.44	13.57	03/06/2013
2014-2015	10016.13	23.145	09/09/2014	0	13.2	04/11/2014
2015-2016	4804.96	18.74	07/08/2015	0	13.65	03/07/2015
2016-2017	8995.63	21.975	10/08/2016	0	13.68	28/01/2017
2017-2018	503.51	15.405	24/06/2017	18.88	13.71	15/05/2018

Stage Discharge Sheet for Narmada at Garudeshwar for the period 2017-18

Day	June		July		August		September		October		November	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	31.37	13.88	30.6	13.88	55.18	13.93	53	13.9	39.85	13.72	32.22	13.63
2	58.37	14.07	25.00	13.70	52.98	13.91	52.18	13.89	37.20	13.71	31.14	13.62
3	249.84	14.48	22.78	13.65	36.65	13.89	52.00	13.88	37.12	13.71	32.24	13.63
4	255.83	14.50	29.97	13.85	36.55	13.86	50.25	13.88	37.74	13.72	32.20	13.63
5	261.94	14.59	23.64	13.76	37.12	13.86	48.48	13.86	31.09	13.65	31.58	13.62
6	268.49	14.6	44.85	15.2	38.00	13.85	49.96	13.84	31.8	13.65	30.17	13.61
7	271.57	14.71	23.37	13.76	38.04	13.85	48.39	13.86	35.19	13.69	29.69	13.61
8	59.64	13.98	23.92	13.79	36.92	13.84	46.06	13.83	33.95	13.68	30.7	13.61
9	25.32	13.79	23.92	13.79	38	13.86	42.48	13.75	30.81	13.67	30.57	13.61
10	51.97	13.92	27.33	13.76	37.61	13.85	40.12	13.73	40.9	13.72	29.38	13.6
11	51.55	13.91	26.31	13.77	37.56	13.84	37.78	13.72	40.51	13.71	30.98	13.61
12	50.23	13.9	26.87	13.79	33.74	13.83	38.89	13.75	30.62	13.65	30.88	13.61
13	51.76	13.99	26.6	13.74	33.50	13.70	39.14	13.75	30.54	13.65	30.88	13.61
14	461.96	14.97	27.49	13.81	33.5	13.67	39.44	13.76	30.54	13.65	30.7	13.61
15	323.87	14.64	28.01	13.81	32.80	13.66	40.18	13.74	30.44	13.65	39.6	13.71
16	57.39	14.06	28.01	13.80	32.81	13.66	40.14	13.75	30.54	13.65	30.44	13.61
17	345.87	14.73	32.2	13.79	35.7	13.68	40.10	13.75	30.39	13.64	30.33	13.61
18	250.15	14.53	32.62	13.8	34.1	13.64	41.48	13.75	30.28	13.65	30.75	13.61
19	116.7	14.23	31.09	13.79	33.58	13.64	41.33	13.75	30.12	13.65	30.70	13.61
20	64.3	14.41	32.1	13.8	33.45	13.60	39.47	13.73	30.12	13.65	30.5	13.61
21	50.61	13.88	32.04	13.8	43.18	13.74	41.47	13.75	30.12	13.65	30.29	13.61
22	23.65	13.66	36.29	13.9	42.32	13.7	40.67	13.73	30.12	13.65	29.05	13.6
23	198.86	14.6	36.25	13.90	38.4	13.72	40.48	13.74	34.45	13.66	30.22	13.61
24	503.51	15.4	45.68	13.92	55.92	13.86	40.90	13.74	33.89	13.64	29.3	13.6
25	450.55	14.95	45.03	13.91	56.13	13.75	40.95	13.74	33.59	13.64	29.71	13.6
26	400.13	14.80	47.27	13.94	57.22	13.94	40.67	13.74	33.58	13.64	29.71	30.60
27	361.21	14.77	47.1	13.95	10065.00	14.10	39.18	13.73	32.7	13.63	30.45	13.6
28	300.13	14.45	46.05	13.92	124.23	14.22	40.57	13.74	33.72	13.64	29.96	13.61
29	129.98	14.19	55.13	13.98	67.58	13.99	40.29	13.73	32.65	13.63	29.1	8.6
30	24.14	13.79	55.10	13.98	64.43	13.98	40.28	13.73	32.67	13.63	29.05	13.61
31			62.28	13.96	62.7	13.94			32.44	13.63		
Ten-Daily Mean												
I Ten-Daily	127.85	12.8	22.65	11.16	36.91	12.49	33.86	9.69	24.47	9.58	24.61	10.89
II Ten-Daily	147.21	11.49	26.33	12.41	24.1	9.6	35.78	12.37	25.35	10.92	25.42	10.9
III Ten-Daily	159.21	11.47	37.9	11.39	50.54	11.37	32.43	10.99	27.02	11.16	26.71	11.74
Monthly												
Min.	23.65	13.66	22.78	13.65	32.81	13.64	37.78	13.72	30.12	13.63	29.05	8.6
Max.	503.51	15.4	62.28	15.2	124.23	14.22	53	13.9	40.9	13.72	39.6	13.71
Mean	144.76	11.92	28.96	11.65	37.18	11.15	34.03	11.02	25.61	10.56	25.58	11.18

Annual Runoff in MCM : 1168.18
Peak Observed Discharge = 503.51 cumecs on 24/6/2017 Corres. Water Level 15.4 m
Lowest Observed Discharge = 18.88cumecs on 15/5/2018 Corres. Water Level 13.71 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge #:Discarded Discharge (values changed as per rating curve)
Note:Missing values ignored while arriving at Annual Ru

Stage Discharge Sheet for Narmada at Garudeshwar for the period 2017-18

Day	December		January		February		March		April		May	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	28.76	13.6	31.65	13.65	38.65	13.72	36.21	13.82	35.34	13.86	23.03	13.79
2	28.70	13.60	32.01	13.66	34.54	13.72	36.20	13.82	35.34	13.86	22.12	13.78
3	29.00	13.61	31.16	13.64	35.05	13.72	36.25	13.82	34.07	13.87	22.81	13.77
4	29.45	13.61	33.76	13.62	36.10	13.74	36.47	13.83	33.7	13.87	21	13.77
5	31.43	13.62	33.26	13.62	36.47	13.76	36.47	13.83	30.94	13.87	21.28	13.77
6	30.72	13.63	32.23	13.61	38.13	13.79	41.54	13.85	28.18	13.86	21.45	13.76
7	31.52	13.62	32.25	13.61	36.84	13.77	39.18	13.85	29.79	13.87	21.46	13.76
8	29.64	13.62	33.77	13.61	46.86	13.9	38.5	13.85	28.90	13.85	20.43	21.7
9	29.64	13.62	36.87	13.63	45.99	13.89	38.89	13.85	27.59	13.84	20.09	13.74
10	30.00	13.62	35.11	13.63	44.1	13.86	35.06	13.83	28.9	13.85	20.18	13.74
11	30.21	13.62	36.14	13.62	45.50	13.87	37.00	13.85	25.99	13.84	20.14	13.73
12	29.45	13.61	36.32	13.63	45.94	13.89	38.7	13.86	27.35	13.85	20.96	13.74
13	29.99	13.61	36.27	13.62	44.38	13.88	35.34	13.82	27.95	13.85	19.50	13.71
14	31.55	13.63	35.35	13.60	40.48	13.83	32.84	13.78	27.95	13.85	19.28	13.71
15	31.81	13.64	35.33	13.6	42.75	13.85	37.47	13.86	26.85	13.84	18.88	13.71
16	31.48	13.64	36.24	13.63	43.02	13.85	36.2	13.85	25.44	13.84	20.52	13.73
17	31.48	13.63	36.82	13.63	41.91	13.81	38.96	13.87	32.05	13.85	20.85	13.75
18	31.28	13.63	36.29	13.63	40.78	13.79	36.85	13.87	27.42	13.84	21.02	13.78
19	30.82	13.63	36.37	13.63	36.82	13.77	36.82	21.85	25.61	13.82	20.54	13.77
20	30.84	13.63	36.59	13.64	36.93	13.77	37.57	13.86	24.2	13.82	20.50	13.76
21	30.88	13.63	37.50	13.67	25.72	13.66	38.86	13.87	26.34	13.84	20.49	13.78
22	30.01	13.62	37.75	13.7	39.33	13.82	38.7	13.86	25.95	13.84	20.33	13.77
23	30.01	13.62	38.47	13.72	41.04	13.84	38.95	13.87	25.95	13.84	20.23	13.77
24	30.15	13.63	37.25	13.7	39.61	13.83	37.72	13.86	25.44	13.84	20.43	13.77
25	30.64	13.63	37.47	13.71	43.90	13.85	36.50	13.84	24.87	13.84	19.84	13.76
26	30.64	13.63	37.45	13.71	44	13.85	36.16	13.84	24.96	13.83	20.04	13.77
27	28.83	13.62	37.33	13.71	39.37	13.83	35.63	13.87	25.55	13.84	19.50	13.76
28	30.53	13.62	37.10	13.70	36.85	13.83	36.36	8.88	25.55	13.84	19.5	13.76
29	31.22	13.64	36.08	13.69			13.36	13.85	25.50	13.84	19.56	13.76
30	31.22	13.64	36.91	13.7			36.45	13.86	25.47	13.84	21.51	13.78
31			37.8	13.72			36.45	13.86			19.79	13.77
Ten-Daily Mean												
I Ten-Daily	18.15	8.17	29.98	12.27	35.66	12.41	26.58	9.69	24.85	11.09	19.24	13.18
II Ten-Daily	27.74	12.26	32.64	12.26	33.22	11.07	29.39	11.87	21.6	11.07	14.13	9.62
III Ten-Daily	16.56	7.43	27.19	9.97	33.24	12.08	23.85	8.37	17.87	9.69	18.34	12.52
Monthly												
Min.	28.76	13.6	31.16	13.6	25.72	13.66	32.84	8.88	24.2	13.82	18.88	13.71
Max.	31.81	13.64	38.47	13.72	46.86	13.9	41.54	21.85	35.34	13.87	23.03	21.7
Mean	20.82	9.29	29.94	11.5	34.04	11.85	26.61	9.98	21.44	10.62	17.24	11.77

Annual Runoff in mm : 1168182.95

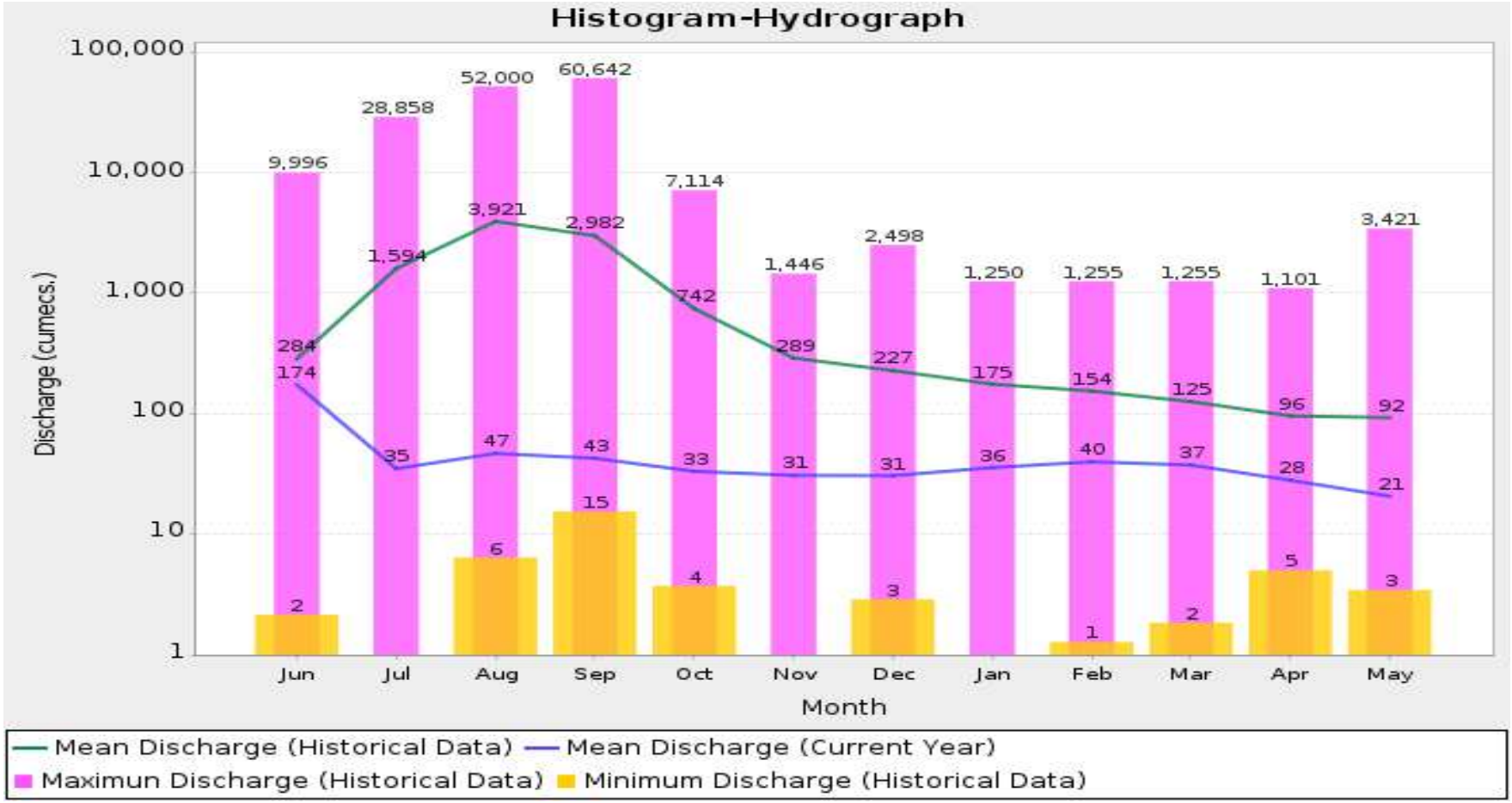
Peak Computed Discharge = 0 cumecs Corres. Water Level 0 m

Lowest Computed Discharge = 1000000cumecs Corres. Water Level 0 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge #:Discarded Discharge (values changed as per rating curve)

Note:Missing values ignored while arriving at Annual Runoff

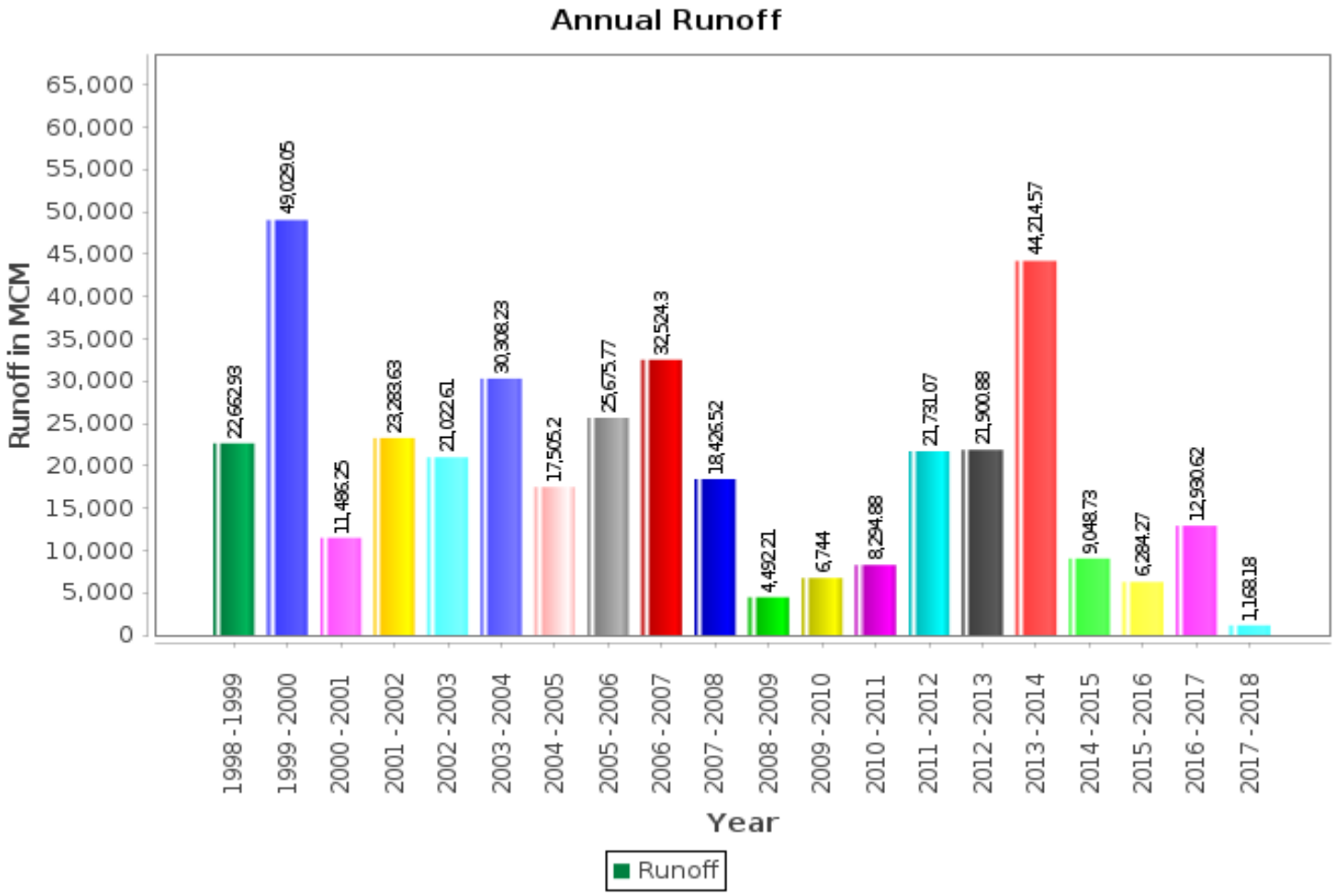
Histogram - Hydrograph for Water Year: 2017-2018 (Data considered: 1972-2018)



Annual Runoff Values for the period (1972 – 2018)

Station Name: Narmada at Garudeshwar (01 02 15 030) Division: Tapi Division, Surat

Local River: Narmada Sub-Division:LNSD,CWBharuch



Note: Missing values have not been considered while arriving at Annual Runoff

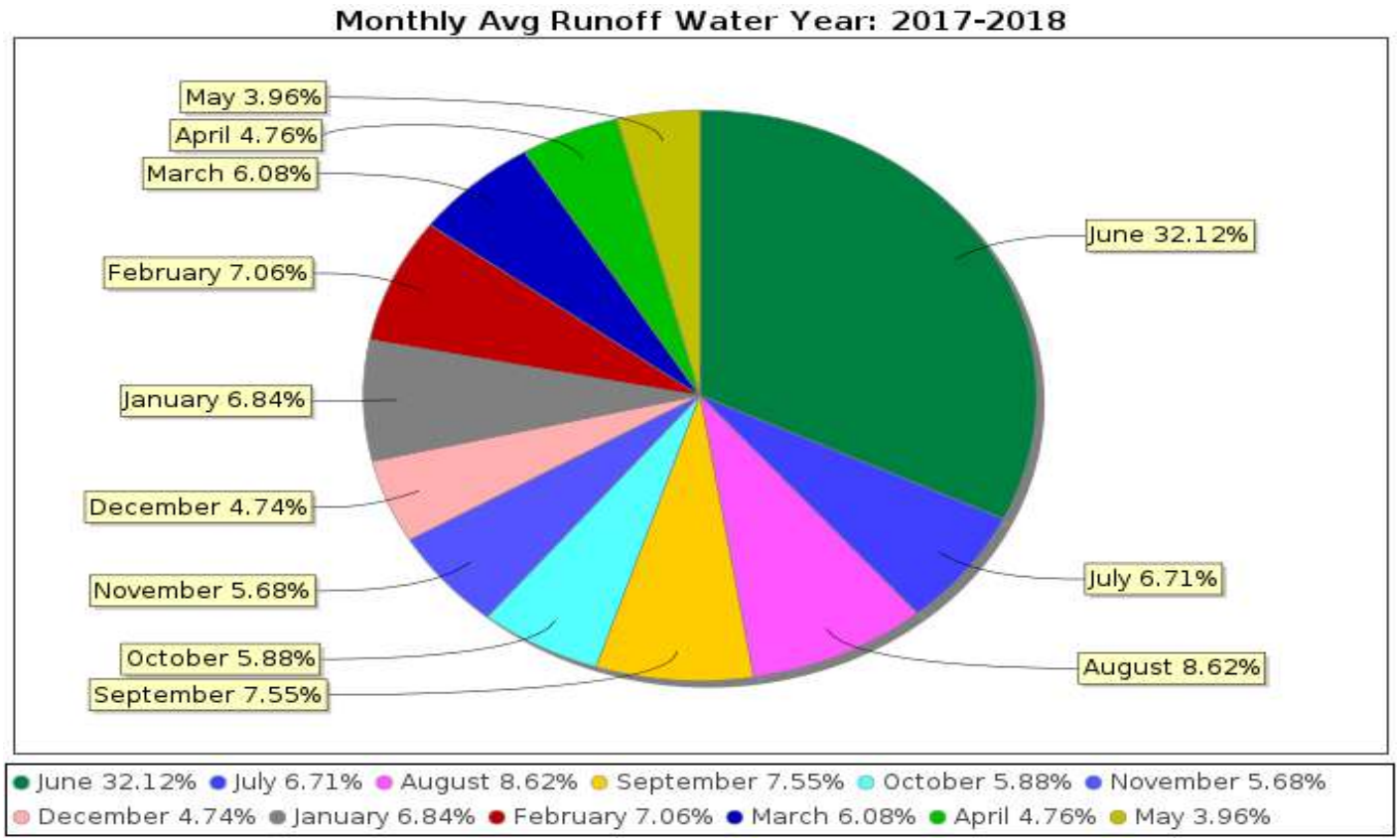
Monthly Average Runoff based on period (1972 – 2018)

Station Name: Narmada at Garudeshwar (01 02 15 030)

Division: Tapi Division, Surat

Local River: Narmada

Sub-Division: LNSD, CWC Bharuch



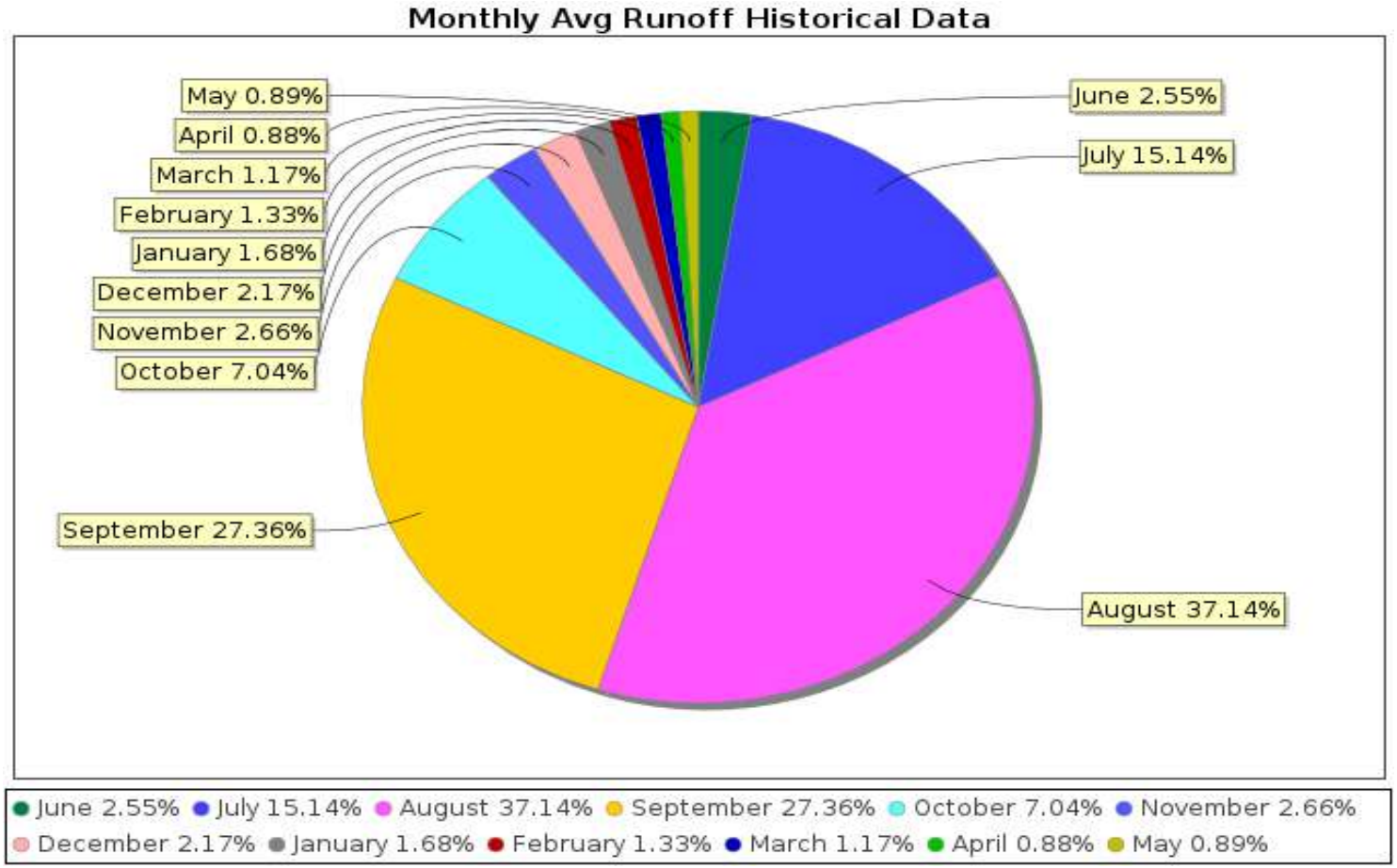
Monthly Runoff for the Year(2017-18)

Station Name : Narmada at Garudeshwar (01 02 15 030)

Division : Tapi Division, Surat

Local River : Narmada

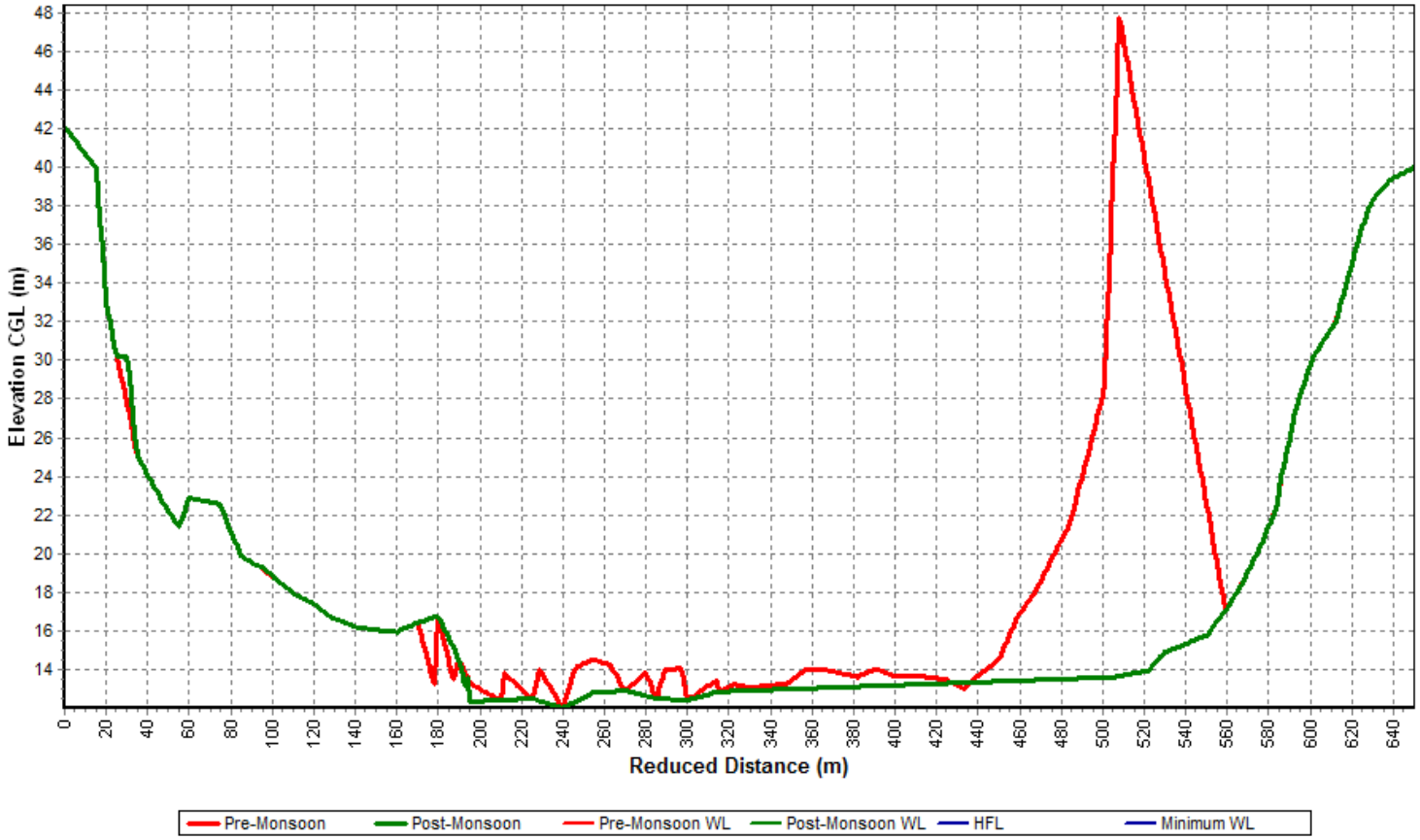
Sub-Division : LNSD, CWC Bharuch



Pre-Monsoon & Post-Monsoon X-Section for Water Year (2017-2018)

Station Name: Narmada at Garudeshwar (01 02 15 030) Division: Tapi Division, Surat

Local River: Narmada Sub-Division: LNSD, CWC Bharuch



4.3 Narmada at Mandleshwar

History Sheet

HISTORY SHEET (DISCHARGE AND WATER LEVEL)

			Water Year	:	2017 - 2018
Site	:	Mandleshwar	**Code**	:	017-NDBHP
State	:	Madhya Pradesh	**District**	:	Khargone
Basin	:	NARMADA	**Independent River**	:	Narmada
Tributary	:	-	**Sub Tributary**	:	-
Sub-Sub Tributary	:	-	**Local River**	:	Narmada
Division	:	Narmada Division(ND), Bhopal	**Sub-Division**	:	Middle Narmada Sub-Division-III, Indore
Drainage Area	:	72809.0 Sq. Km.	**Bank**	:	Right
Latitude	:	22°10'18''	**Longitude**	:	75°39'39''
Current Zero of Gauge (m)	:	138			

CATEGORY		Opening Date	Closing Date
Gauge	:	16/12/1970	
Discharge	:	28/08/1971	
Sediment	:	14/04/1972	
Water Quality	:		

Reduced Level	Opening Date	Closing Date
138.0	14/10/2016	05/01/2017
138.0	05/01/2017	-
138.0	16/12/1970	14/10/2016

Annual Maximum / Minimum discharge with corresponding Water Level (m.s.l)						
	Maximum			Minimum		
Year	Q (cumecs)	WL (m)	Date	Q (cumecs)	WL (m)	Date
1970-1971	0	139.235	23/05/1971	0	139.235	23/05/1971
1971-1972	13019	148.61	07/09/1971	30.9	139.185	30/05/1972
1972-1973	18973.7	149.713	02/09/1972	26.5	139.135	28/05/1973
1973-1974	44900	157.1	31/08/1973	28.2	139.225	25/05/1974
1974-1975	31454	153.215	20/08/1974	32.4	139.14	30/05/1975
1975-1976	32213.6	152.685	12/09/1975	19.1	139.186	16/06/1975
1976-1977	12927.9	147.073	06/08/1976	11	139.505	30/12/1976
1977-1978	24844	150.1	15/09/1977	55.4	139.245	26/05/1978
1978-1979	27373.4	150.575	30/08/1978	49.9	139.215	08/06/1978
1979-1980	32084.3	151.6	10/08/1979	34.5	139.09	26/05/1980
1980-1981	21843.6	149.75	30/08/1980	37.5	139.26	02/06/1980
1981-1982	27983.8	151.905	10/08/1981	39.2	139.275	17/05/1982
1982-1983	17050	147.935	23/08/1982	36.3	139.235	28/05/1983
1983-1984	19420	148.97	11/09/1983	24.6	139.16	10/06/1983
1984-1985	46000	155.55	19/08/1984	33.9	139.19	31/05/1985
1985-1986	13850	147.71	10/08/1985	30.2	139.235	26/05/1986
1986-1987	32600	152.55	15/08/1986	31.8	139.22	11/06/1986
1987-1988	21313	149.19	28/08/1987	16.43	139.12	31/05/1988
1988-1989	21400	149.2	05/08/1988	11.92	139.08	06/06/1988
1989-1990	13650	147.07	08/08/1989	16	139.1	04/06/1989
1990-1991	37750	153.2	23/08/1990	108	139.5	14/06/1990
1991-1992	21750	149.2	31/07/1991	22.6	139.77	08/06/1991
1992-1993	9900	145.68	18/08/1992	40	139.4	09/06/1992
1993-1994	29000	151.8	17/07/1993	47.15	139.29	14/06/1993
1994-1995	48200	157.23	06/09/1994	118.2	139.66	19/05/1995
1995-1996	12500	147	25/07/1995	58	139.37	26/05/1996
1996-1997	31025	152	28/07/1996	69.48	139.42	26/06/1996
1997-1998	33500	153.15	26/07/1997	70	139.37	12/06/1997
1998-1999	27900	151.15	15/09/1998	54.14	139.29	31/05/1999
1999-2000	30150	151.66	21/09/1999	39.91	139.29	10/06/1999
2000-2001	5790	143.98	31/07/2000	55.15	139.39	05/05/2001
2001-2002	11725	146	16/08/2001	51.69	139.36	04/06/2001
2002-2003	14950	147.98	03/09/2002	57	139.42	25/05/2003
2003-2004	11905	146.66	29/07/2003	3.46	138.82	27/11/2003
2004-2005	12100	146.74	25/08/2004	12	139.03	14/04/2005
2005-2006	8793.7	145.3	04/08/2005	51.53	139.38	30/03/2006

2006-2007	18482.74	148.55	20/08/2006	15.3	139.3	22/04/2007
2007-2008	10691.59	145.82	08/08/2007	69.9	139.4	20/06/2007
2008-2009	1583.65	141.65	20/07/2008	149.81	139.78	09/06/2008
2009-2010	15828.13	147.75	12/09/2009	82.57	139.78	12/11/2009
2010-2011	10257.83	145.99	09/09/2010	84.86	139.52	23/06/2010
2011-2012	17698.74	148.75	27/08/2011	266.55	139.94	08/05/2012
2012-2013	33479.3	153.15	06/09/2012	46.27	139.49	17/02/2013
2013-2014	46398.29	154.575	24/08/2013	214.02	139.575	12/05/2014
2014-2015	10407.92	145.75	08/09/2014	3.17	139.09	11/07/2014
2015-2016	2311.07	142.12	17/08/2015	138.94	139.42	30/05/2016
2016-2017	10200	146.07	09/08/2016	106.3	139.51	29/06/2016
2017-2018	2620.52	142.29	15/09/2017	5.74	139.72	13/12/2017

Stage Discharge Sheet for Narmada at Mandleshwar for the period 2017-18

Day	June		July		August		September		October		November	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	1007.34	140.89	558.32	140.41	315.99	140.02	421.99	140.21	161	139.61	303.55	140
2	1208.3	141.09	1315	141.18	185.19	139.67	237	139.85	164	139.63	295.16	139.98
3	970.26	140.85	713.76	140.59	165.84	139.56	202	139.72	128.75	139.53	425.15	140.23
4	867	140.75	249.18	139.89	178.17	139.6	175.28	139.61	109.49	139.47	430	140.24
5	468.86	140.3	278.35	139.96	179.75	139.6	159.31	139.57	103.76	139.44	419	140.22
6	352.48	140.11	974.76	140.83	172	139.58	264.8	139.93	143.45	139.61	384.5	140.17
7	399.4	140.19	1082.65	140.97	241.22	139.87	430.87	140.25	178.48	139.71	153.8	139.64
8	765.84	140.64	900.26	140.78	237.42	139.86	380.58	140.14	215	139.83	188.53	139.74
9	999.3	140.88	305	140	175.41	139.61	416.23	140.21	202.33	139.79	296.04	139.98
10	921	140.8	305.8	140	106.54	139.38	179	139.65	299.25	139.98	207.38	139.8
11	1617	141.45	309.55	140.01	92.45	139.32	172.86	139.64	296.56	139.98	223.48	139.83
12	858.37	140.74	671.17	140.54	87.24	139.3	2105.32	142.09	376.39	140.16	145	139.62
13	783.67	140.66	797.45	140.66	71	139.26	2492.54	142.2	275.5	139.94	134.12	139.57
14	475.15	140.31	522.83	140.36	231.6	139.82	2397.1	142.16	228.9	139.84	206.95	139.8
15	990.92	140.87	695.11	140.57	337	140.07	2620.52	142.29	247	139.88	228.32	139.84
16	705.69	140.58	215	139.8	259.63	139.92	1362.51	141.23	182.84	139.73	284.74	139.96
17	605.72	140.47	337.88	140.07	111.12	139.43	245	139.88	269.29	139.93	182.4	139.73
18	653	140.52	520.81	140.58	99.04	139.38	190.43	139.68	328.85	140.05	141.64	139.6
19	695.48	140.57	205.39	139.73	96.25	139.37	544.94	140.39	327.55	140.05	342	140.08
20	536.75	140.38	159.32	139.52	470	140.3	394.96	140.18	300.22	139.99	112.92	139.49
21	679	140.55	109.38	139.41	326	140.05	429.94	140.24	228.82	139.84	101.94	139.4
22	474.73	140.31	113.56	139.44	489.14	140.33	648.92	140.5	222.15	139.8	95.56	139.37
23	1655.24	141.47	210	139.78	342.98	140.08	537.35	140.37	170.43	139.7	84.99	139.33
24	1613.14	141.45	413.68	140.21	179.89	139.65	278	139.96	207.62	139.8	207.26	139.8
25	725	140.6	459.11	140.28	196	139.7	233.57	139.85	270.18	139.93	264.48	139.92
26	176	139.65	326.05	140.05	650.4	140.5	177.68	139.77	384.17	140.17	199	139.78
27	379.81	140.16	412.06	140.21	392	140.18	173.06	139.72	276.71	139.94	228.11	139.84
28	754.33	140.63	263.89	139.93	309.16	140.01	167.31	139.68	256.18	139.94	195.69	139.77
29	585.13	140.42	327.95	139.97	514.36	140.36	169.81	139.69	310.65	140	322.82	140.04
30	703.86	140.58	225	139.82	983.73	140.88	165	139.65	329.23	140.05	246.57	139.88
31			273.36	139.95	976.41	140.85			336.55	140.07		
Ten-Daily Mean												
I Ten-Daily	795.98	140.65	668.31	140.46	195.75	139.68	286.71	139.91	170.55	139.66	310.31	140
II Ten-Daily	792.17	140.66	443.45	140.18	185.53	139.62	1252.62	140.97	283.31	139.96	200.16	139.75
III Ten-Daily	774.62	140.58	284.91	139.91	487.28	140.23	298.06	139.94	272.06	139.93	194.64	139.71
Monthly												
Min.	176	139.65	109.38	139.41	71	139.26	159.31	139.57	103.76	139.44	84.99	139.33
Max.	1655.24	141.47	1315	141.18	983.73	140.88	2620.52	142.29	384.17	140.17	430	140.24
Mean	787.59	140.63	465.56	140.19	289.52	139.84	612.46	140.28	241.97	139.85	235.04	139.82

Annual Runoff in MCM : 9168.24

Peak Observed Discharge = 2620.52 cumecs on 15/9/2017 Corres. Water Level 142.29 m

Lowest Observed Discharge = 5.74cumecs on 13/12/2017 Corres. Water Level 139.72 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge #:Discarded Discharge (values changed as per rating curve)

Stage Discharge Sheet for Narmada at Mandleshwar for the period 2017-18

Day	December		January		February		March		April		May	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	203.1	139.790	107.5	139.390	348.3	140.080	40.58	139.220	84.92	139.410	249.4	139.940
2	190.2	139.700	193.3	139.740	199.6	139.750	55.24	139.300	84.92	139.410	117.6	139.550
3	178.9	139.680	142.8	139.580	209.1	139.780	89.34	139.370	217.3	139.910	166.8	139.740
4	176.4	139.670	117.2	139.450	138.5	139.600	91.25	139.380	206.2	139.860	185.9	139.750
5	166.2	139.680	239.8	139.850	132.2	139.550	91.25	139.380	76.18	139.370	156.2	139.700
6	127.9	139.550	167.9	139.670	173.0	139.680	111.8	139.480	50.42	139.260	140.2	141.000
7	106.1	139.420	291.0	139.960	239.4	139.850	96.62	139.460	32.18	139.190	135.3	141.620
8	244.4	139.880	194.1	139.740	343.1	140.070	71.54	139.340	33.58	139.200	161.5	139.720
9	149.0	139.610	117.5	139.450	409.9	140.190	48.45	139.250	48.11	139.250	185.0	139.800
10	155.8	139.700	79.61	139.300	269.1	139.920	81.66	139.390	34.70	139.200	272.6	139.980
11	180.0	139.720	160.7	139.650	301.0	139.980	100.2	139.400	50.49	139.260	619.8	140.480
12	120.7	139.500	180.2	139.700	306.4	140.000	143.0	139.650	42.67	139.230	124.3	139.580
13	574.0	139.720	199.1	139.750	306.1	140.000	117.2	139.550	32.09	139.190	176.3	139.770
14	175.0	139.690	146.0	139.590	306.1	140.000	144.0	139.650	58.00	139.400	176.3	139.770
15	139.6	139.890	323.4	140.030	267.9	139.920	146.4	139.660	170.1	139.650	262.5	139.960
16	126.6	139.540	328.4	140.040	139.1	139.770	124.9	139.580	205.6	139.860	262.5	139.960
17	110.4	139.400	333.5	140.050	113.0	139.480	347.8	140.110	255.1	139.940	279.2	139.990
18	80.35	139.300	193.1	139.780	120.9	139.530	347.8	140.110	82.68	139.380	130.1	139.590
19	333.4	140.050	136.0	139.560	123.3	139.550	342.6	140.100	100.0	139.470	269.7	139.970
20	279.3	139.940	172.5	139.680	83.77	139.350	316.2	140.040	100.1	139.470	299.2	140.000
21	140.2	139.570	130.2	139.500	81.73	139.340	109.3	139.500	47.78	139.250	299.2	140.000
22	114.1	139.420	109.0	139.400	75.61	139.300	98.61	139.460	47.78	139.250	208.5	139.880
23	102.3	139.370	381.3	140.140	188.1	139.850	120.3	139.560	75.16	139.380	307.1	140.030
24	110.0	139.400	204.7	139.770	127.9	139.580	118.9	139.580	99.13	139.460	549.7	140.450
25	114.4	139.450	323.1	140.030	115.1	139.450	118.9	139.580	124.0	139.580	349.2	140.120
26	120.5	139.500	122.1	139.500	77.61	139.310	100.7	139.470	122.6	139.650	166.0	139.740
27	148.3	139.610	122.1	139.500	38.01	139.210	120.7	139.560	142.7	139.650	385.0	140.000
28	140.3	139.570	107.0	139.500	32.89	139.190	166.1	139.800	138.6	139.570	423.0	140.240
29	119.6	139.500	106.7	139.390			140.2	139.600	180.0	139.600	163.2	139.730
30	116.8	139.400	85.22	139.320			83.00	139.400	220.9	139.850	436.4	140.260
31	116.8	139.400	106.5	132.390			82.76	139.400			580.5	140.500
Ten-Daily Mean												
I Ten-Daily	117.3	97.76	165.07	139.61	232.36	125.89	63.12	111.49	75.01	111.54	163.03	125.98
II Ten-Daily	154.06	125.74	217.29	139.78	134.85	97.81	168.22	111.83	76.87	97.63	186.2	97.93
III Ten-Daily	91.1	101.45	163.43	139.58	77.73	121.97	83.39	101.48	74.98	97.65	316.62	127.36
Monthly												
Min.	5.74	139.3	79.61	139.3	32.89	139.19	40.58	139.22	32.09	139.19	117.6	139.55
Max.	333.35	140.05	381.33	140.14	409.94	140.19	347.78	140.11	255.14	139.94	619.77	141.62
Mean	120.82	108.31	181.93	139.66	148.31	115.22	104.91	108.27	75.62	102.28	221.95	117.09

Annual Runoff in MCM = 9587 Annual Runoff in mm = 132

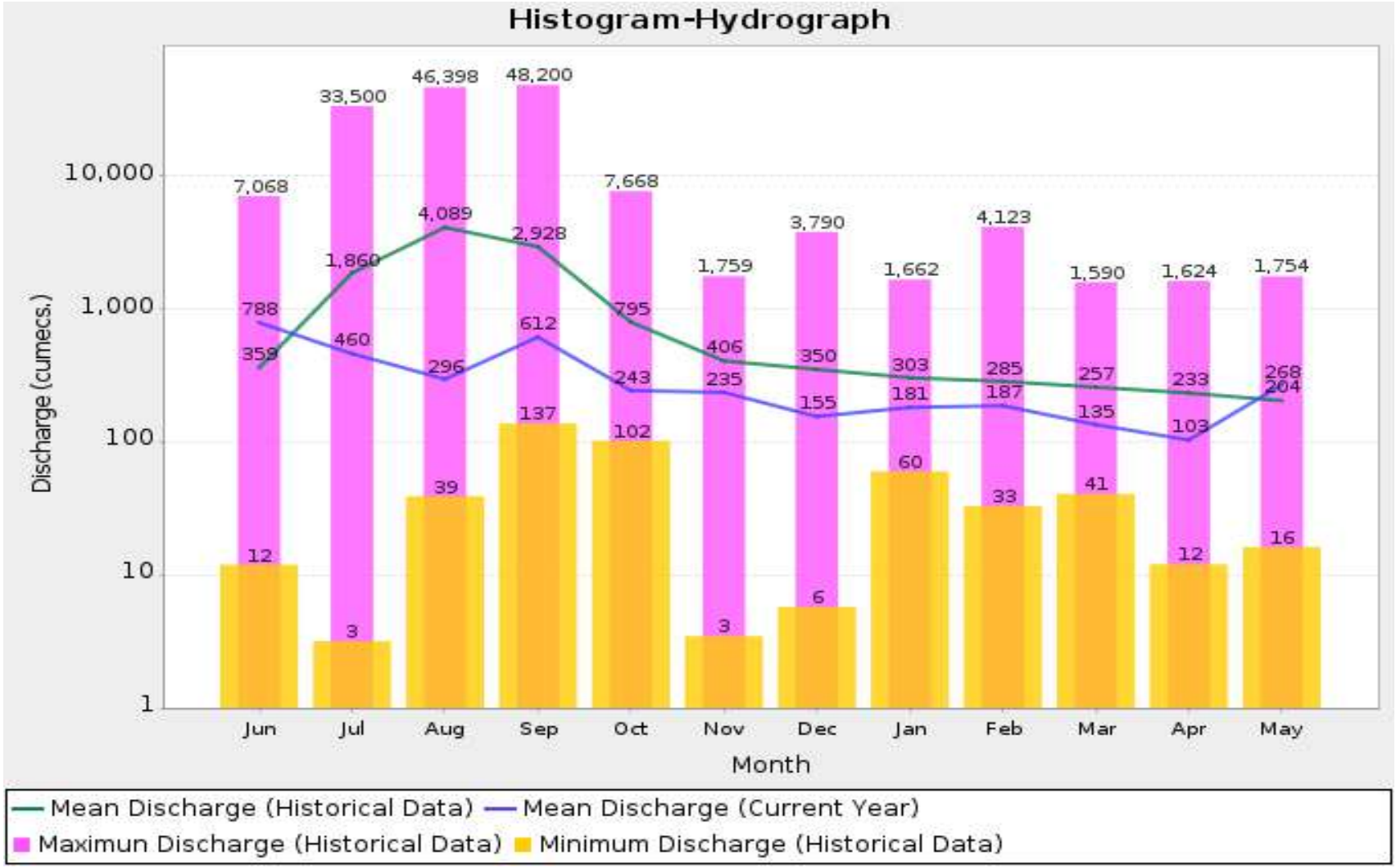
Peak Observed Discharge = 2621 cumecs on 15/09/2017 Corres. Water Level :142.29 m

Lowest Observed Discharge = 32.09 cumecs on 13/04/2018 Corres. Water Level :139.19 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge #:Discarded Discharge (values changed as per rating curve)

Note:Missing values ignored while arriving at Annual Runoff

Histogram- Hydrograph for Water Year : 2017-18(Data considered : 1972-2018)



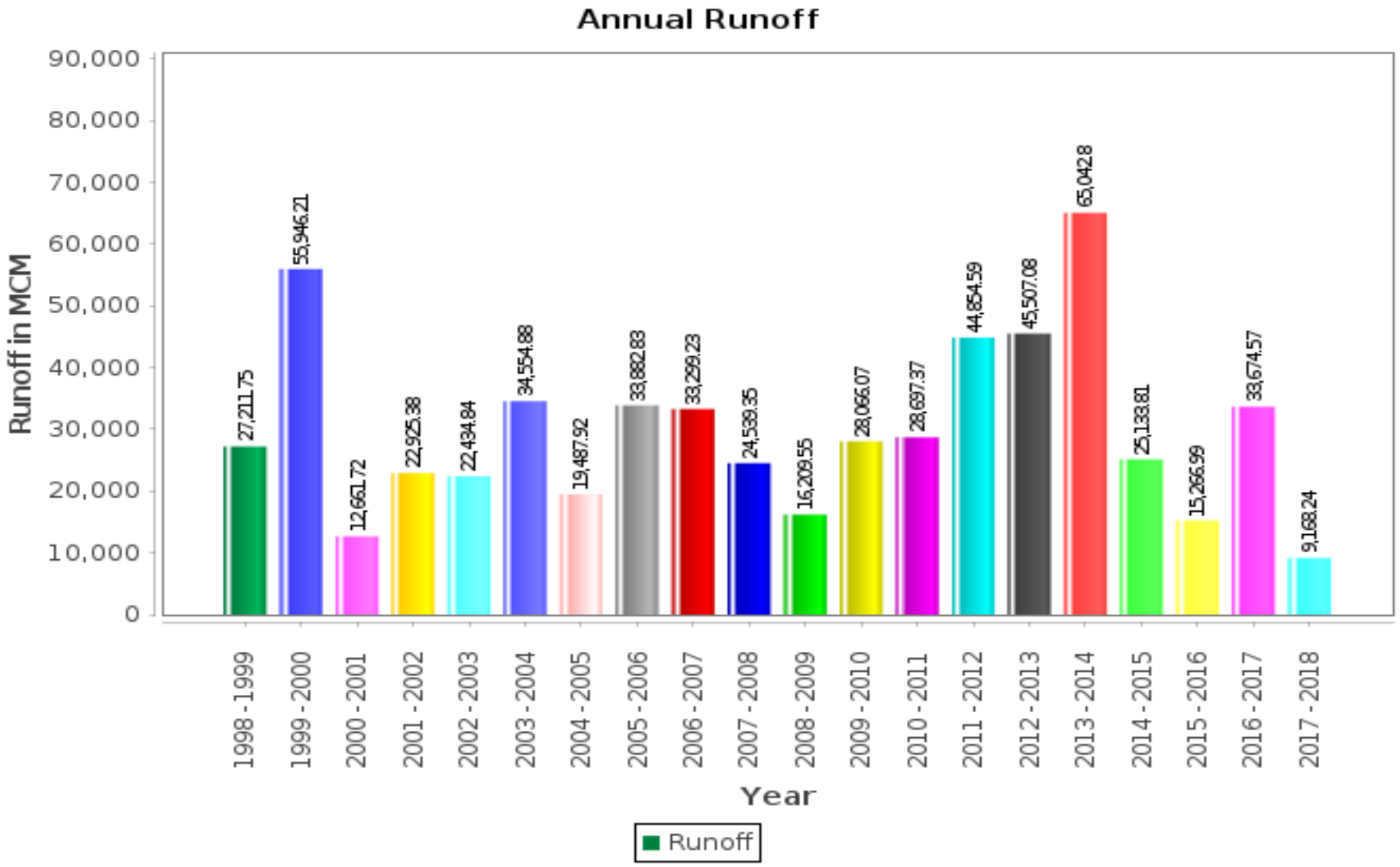
Annual Runoff Values for the period (1972 – 2018)

Station Name : Narmada at Mandleshwar (010215026)

Division : Narmada Division, Bhopal

Local River : Narmada

Sub-Division :MNSD III, CWC Indore



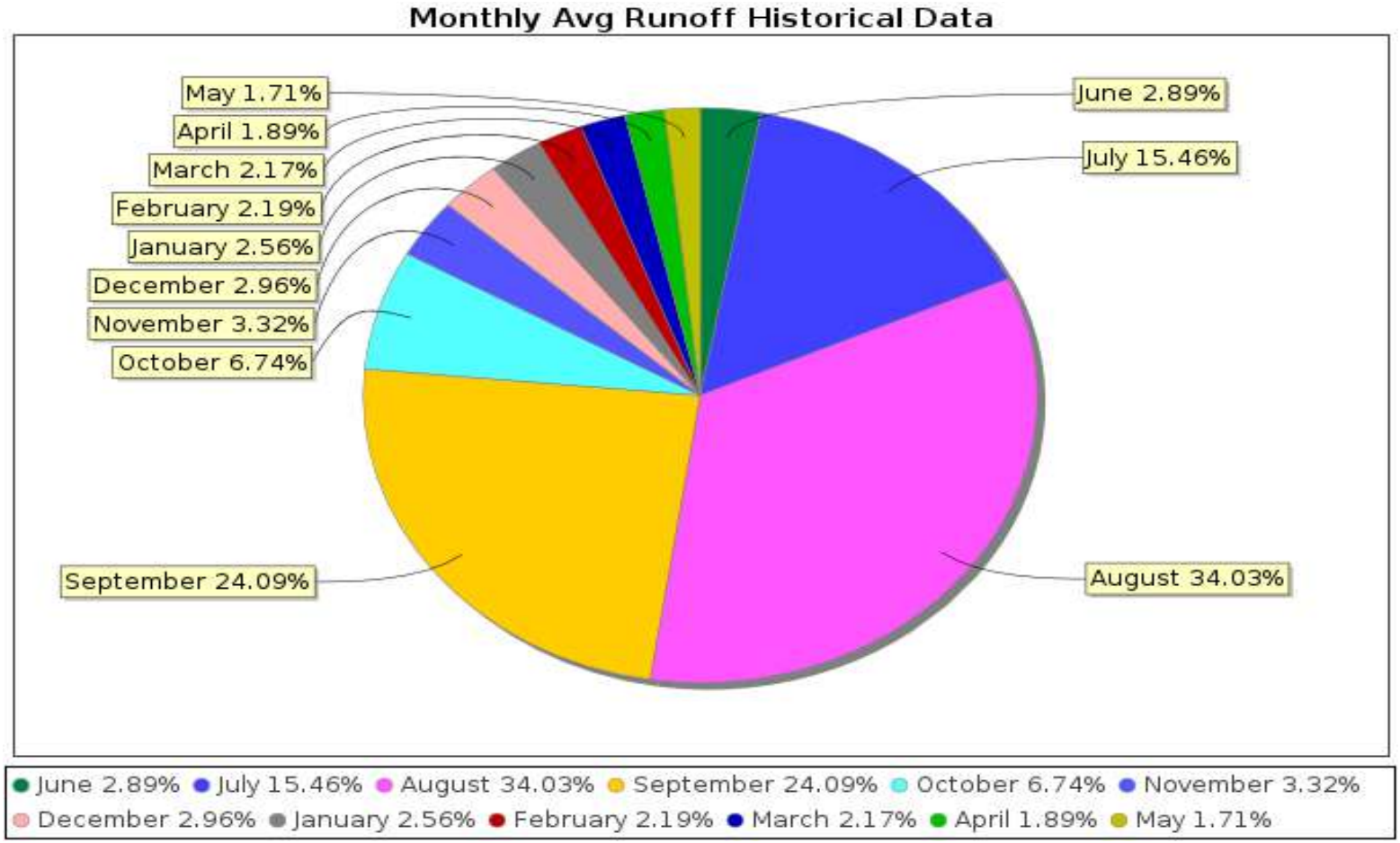
Monthly Average Runoff based on period (1972 – 2018)

Station Name : Narmada at Mandleshwar (010215026)

Division : Narmada Division, Bhopal

Local River : Narmada

Sub-Division :MNSD III, CWC Indore



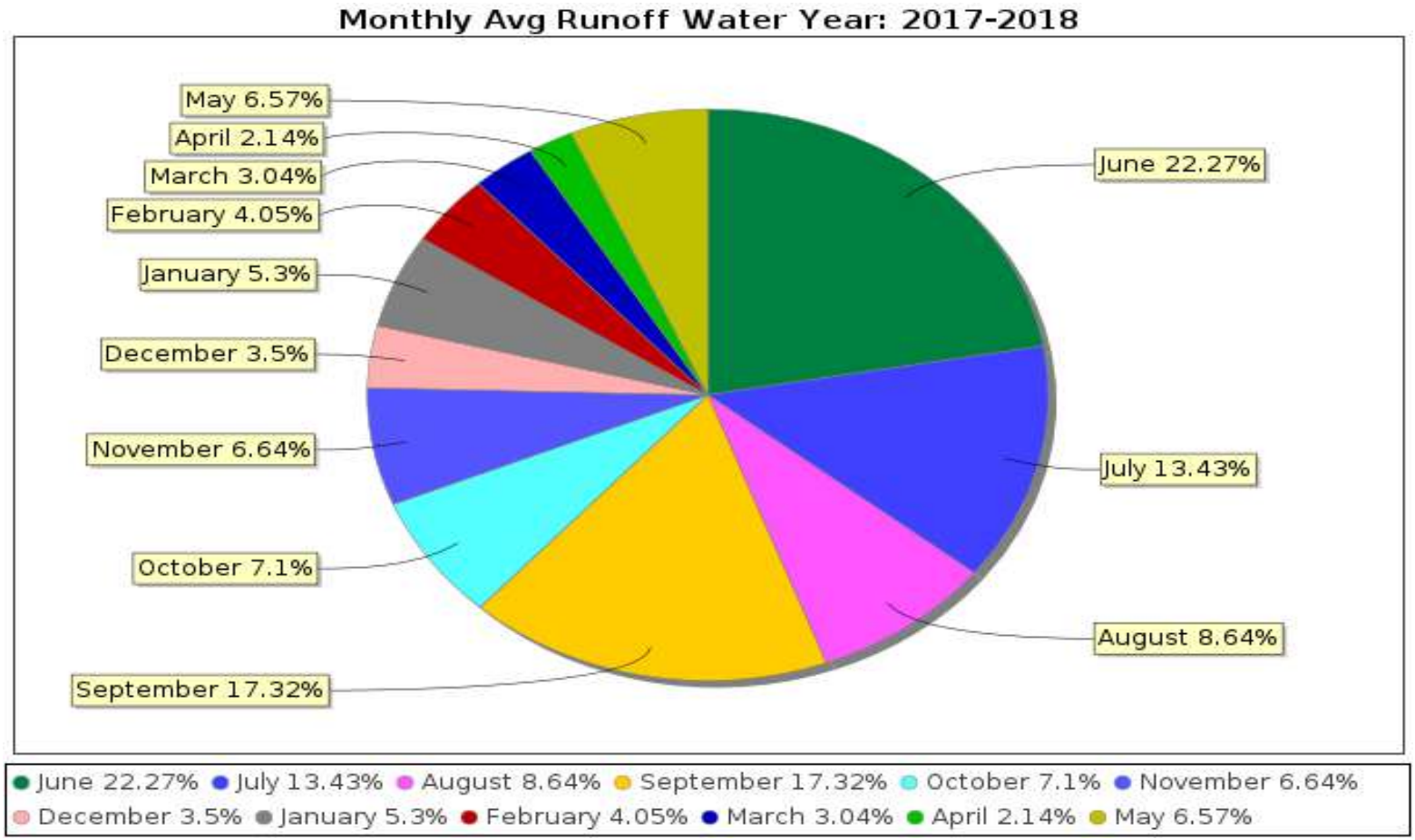
Monthly Runoff for the Year (2017-18)

Station Name : Narmada at Mandleshwar (010215026)

Division : Narmada Division, Bhopal

Local River : Narmada

Sub-Division :MNSD III, CWC Indore



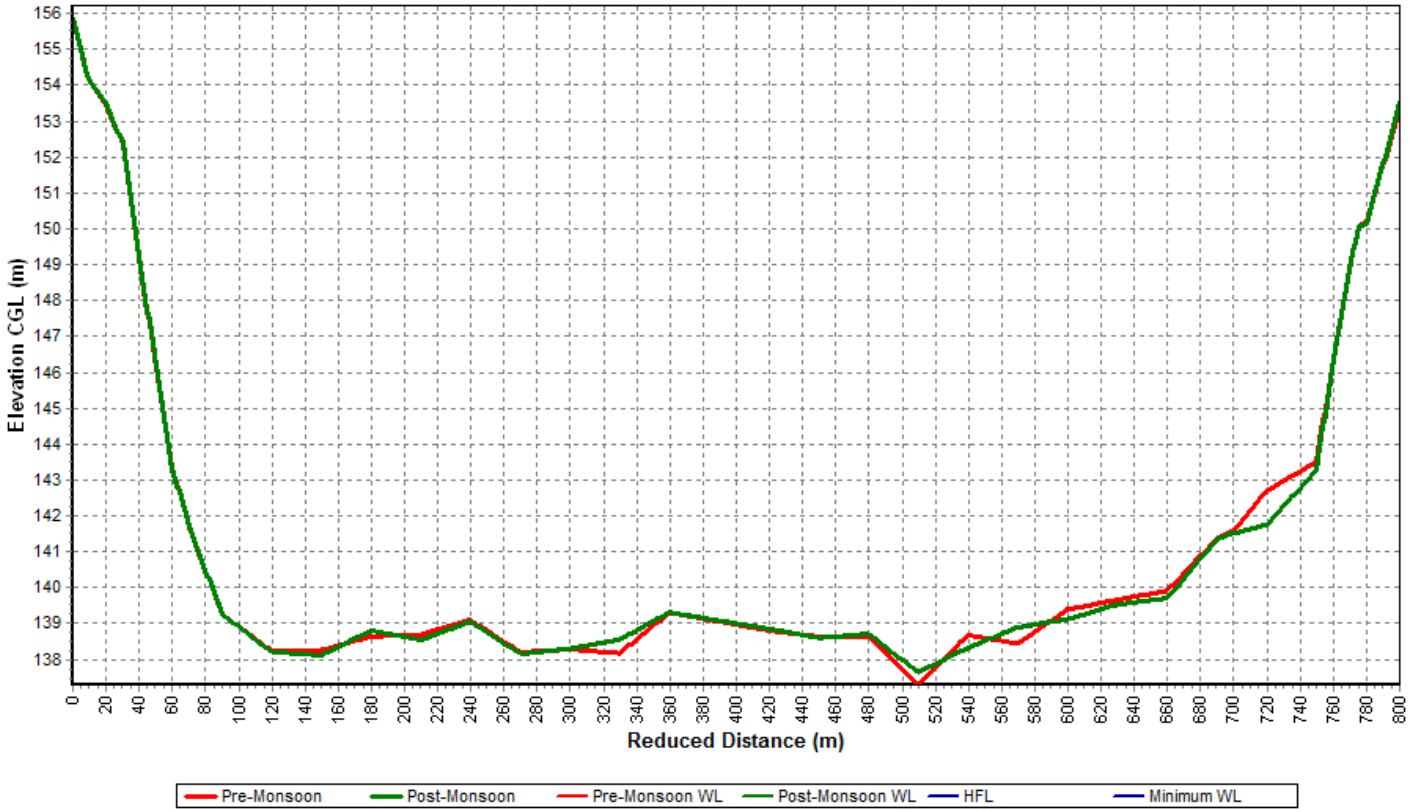
Pre-Monsoon & Post-Monsoon X-Section for Water Year (2017-18)

Station Name : Narmada at Mandleshwar (010215026)

Division : Narmada Division, Bhopal

Local River : Narmada

Sub-Division :MNSD III, CWC Indore



4.4 Kundi at Kogaon

History Sheet

HISTORY SHEET (DISCHARGE AND WATER LEVEL)

			Water Year	:	2017 - 2018
Site	:	kogaon	**Code**	:	007-NDBHP
State	:	Madhya Pradesh	**District**	:	Khargone
Basin	:	NARMADA	**Independent River**	:	Narmada
Tributary	:	Kundi	**Sub Tributary**	:	-
Sub-Sub Tributary	:	-	**Local River**	:	Kundi
Division	:	Narmada Division(ND), Bhopal	**Sub-Division**	:	Middle Narmada Sub-Division-III, Indore
Drainage Area	:	3919.0 Sq. Km.	**Bank**	:	
Latitude	:	22°6'5''	**Longitude**	:	75°41'1''
Current Zero of Gauge (m)	:	151			

CATEGORY		Opening Date	Closing Date
Gauge	:		
Discharge	:		
Sediment	:		
Water Quality	:		

Reduced Level	Opening Date	Closing Date
151.0	05/01/2017	-
151.0	30/10/2015	05/01/2017
151.0	03/02/1978	30/10/2015

Annual Maximum / Minimum discharge with corresponding Water Level (m.s.l)						
	Maximum			Minimum		
Year	Q (cumecs)	WL (m)	Date	Q (cumecs)	WL (m)	Date
1971-1972	0	0	20/05/1972	0	0	20/05/1972
1972-1973	2835.8	227.728	01/07/1972	2.1	219.65	15/08/1972
1973-1974	0	0	30/08/1973	0	0	30/08/1973
1978-1979	1437	156.89	29/08/1978	0	0	06/06/1978
1979-1980	2700	161.1	26/06/1979	0	152.64	05/06/1979
1980-1981	600	155.32	22/06/1980	0	152.585	29/05/1981
1981-1982	2550	160.77	16/08/1981	0	152.545	13/06/1981
1982-1983	396	154.66	15/08/1982	0	152.61	30/01/1983
1983-1984	1135	159	15/09/1983	0	152.4	07/06/1983
1984-1985	1250	158.48	10/08/1984	0.1	152.52	06/06/1984
1985-1986	1520	156.35	09/10/1985	0	152.505	26/02/1986
1986-1987	1600	156.96	15/08/1986	0	0	12/06/1986
1987-1988	3034	157.63	21/08/1987	0	152.435	03/06/1987
1988-1989	3500	158.35	03/10/1988	0	0	03/06/1988
1989-1990	4960	159.9	17/08/1989	0	0	03/06/1989
1990-1991	8300	161.55	23/08/1990	0	152.59	11/06/1990
1991-1992	2090	159.7	30/07/1991	0	151	05/06/1991
1992-1993	650.9	157.4	22/06/1992	0	152.585	05/06/1992
1993-1994	1015	157.76	16/07/1993	0	0	12/06/1993
1994-1995	5500	161.85	31/08/1994	0	0	03/06/1994
1995-1996	2005	157.1	29/06/1995	0	152.395	03/06/1995
1996-1997	1520	156.35	16/09/1996	0	152.5	27/06/1996
1997-1998	3800	159.4	23/08/1997	0	152.28	14/06/1997
1998-1999	5600	161.1	22/09/1998	0	151	14/06/1998
1999-2000	1185	156.1	20/06/1999	0	151.38	09/01/2000
2000-2001	1450	155.1	30/06/2000	0	151.8	02/06/2000
2001-2002	725	155.06	18/06/2001	0	152.3	03/06/2001
2002-2003	5900	161.85	03/09/2002	0.05	152.08	30/11/2002

2003-2004	3500	158.76	02/07/2003	0	151.3	15/02/2004
2004-2005	3600	158.65	05/08/2004	0	0	24/01/2005
2005-2006	124.84	153.95	02/08/2005	0	0	17/06/2005
2006-2007	4021.28	158.75	07/08/2006	0	0	12/06/2006
2007-2008	1255.14	156.7	01/07/2007	0	0	12/06/2007
2008-2009	226.55	153.96	11/09/2008	0	152.23	18/06/2008
2009-2010	657.47	155.37	03/09/2009	0	0	21/06/2009
2010-2011	3463.63	159.15	09/09/2010	0	0	01/01/2011
2011-2012	990.91	155.69	29/08/2011	0	0	24/06/2011
2012-2013	1457.52	156.325	06/09/2012	0	152.46	15/11/2012
2013-2014	1314.3	156	04/07/2013	0	0	01/06/2013
2014-2015	3753.29	160.2	08/09/2014	0	0	01/06/2014
2015-2016	1274.15	156.05	06/08/2015	1.77	152.58	17/10/2015
2016-2017	720	155.2	18/09/2016	1.77	152.58	02/07/2016
2017-2018	1579.2	152.5	13/07/2017	0	152.51	23/02/2018

Stage Discharge Sheet for Kundi at Kogaon for the period 2017-18

Day	June		July		August		September		October		November	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	0	151	4.77	152.42	16.61	152.88	70.67	153.3	55	153.22	19.64	152.9
2	0	151	4.25	152.39	15.89	152.86	61	153.23	50	153.2	23.93	152.93
3	0	151	5.76	152.45	14.26	152.86	51	153.18	43.02	153.14	23.52	152.93
4	0	151	4.73	152.41	13.13	152.85	41.33	153.15	39.15	153.11	16.31	152.88
5	0	151	4.13	152.33	12.74	152.83	37.18	153.13	32.97	153.08	10.11	152.78
6	0	151	2.06	152.31	11.8	152.82	35.38	153.09	28.69	153.03	16.44	152.88
7	0	151	5.48	152.43	12.07	152.81	30.31	153.06	30.69	153.04	10.32	152.79
8	0	151	2.82	152.35	11.12	152.8	27.6	153.01	36	153.1	8.36	152.77
9	0	151	2.02	152.31	12.06	152.83	25.38	152.95	152.82	153.49	8.07	152.77
10	16.96	152.95	0.81	152.27	12.78	152.82	20.5	152.93	151.2	153.57	8.06	152.77
11	287.8	154.6	5.23	152.4	10.9	152.8	23.54	152.94	185.93	153.58	7.83	152.76
12	26.89	153.26	6	152.49	10.18	152.78	17.98	152.89	202.4	153.93	10.12	152.79
13	10.82	152.85	1579.2	152.5	0.09	152.76	105.65	153.35	135.8	153.44	10.77	152.8
14	23.95	152.99	106	153.62	7.88	152.75	35.63	153.12	43.07	153.25	6	152.73
15	17.37	152.96	48.39	153.29	7.8	152.74	33.04	153.06	43	153.25	5.86	152.73
16	10.31	152.81	28.5	153.06	7.49	152.73	195.6	153.74	43.16	153.25	6.02	152.73
17	9.08	152.73	108.5	153.63	7.38	152.73	72.5	153.31	40.78	153.15	7.91	152.76
18	4.62	152.7	28.98	153.07	5.05	152.7	43.15	153.25	38.67	153.14	10.19	152.79
19	3.98	152.65	19.06	152.95	4.18	152.66	204	153.77	38	153.11	7.9	152.76
20	2.36	152.59	18.24	152.91	5	152.69	104.2	153.35	38.58	153.12	5.97	152.73
21	3.22	152.64	25.46	153.03	10.98	152.8	180.5	153.66	42.4	153.16	5.74	152.73
22	3.14	152.64	21.04	152.94	25.57	153.04	198.5	153.93	38.5	153.14	5.73	152.73
23	3.08	152.65	19.1	152.92	23.54	152.96	188.4	153.71	38.69	153.11	7.93	152.76
24	2.46	152.6	17.04	152.92	15.91	152.87	150.13	153.50	34.13	153.09	7.89	152.76
25	2.45	152.6	16.13	152.89	12	152.83	112.5	153.49	28.71	153.01	7.57	152.76
26	2.64	152.6	17.28	152.89	140.95	153.6	133	153.44	23.92	152.93	7.58	152.76
27	2.44	152.6	30.2	153.09	49	153.18	106.4	153.38	19.76	152.9	5.7	152.73
28	4.98	152.56	29.53	153.06	32.93	153.09	85.45	153.35	16.42	152.88	2.91	152.63
29	4.14	152.4	25.41	152.95	165.6	153.6	79.89	153.31	19	152.9	2.88	152.63
30	4.45	152.42	253.7	152.95	166.7	153.6	65.05	153.25	24.17	152.99	2.82	152.63
31			18.92	152.92	166.6	153.5			24.87	152.97		
Ten-Daily Mean												
I Ten-Daily	1.7	151.19	3.68	152.37	13.25	152.84	40.04	153.1	61.95	153.2	14.48	152.84
II Ten-Daily	39.72	153.01	194.81	152.99	6.59	152.73	83.53	153.28	80.94	153.32	7.86	152.76
III Ten-Daily	3.3	152.57	43.07	152.96	73.62	153.19	91.93	92.16	28.23	153.01	5.67	152.71
Monthly												
Min.	0	151	0.81	152.27	0.09	152.66	17.98	152.89	16.42	152.88	2.82	152.63
Max.	287.8	154.6	1579.2	153.63	166.7	153.6	204	153.93	202.4	153.93	23.93	152.93
Mean	14.9	152.26	80.52	152.77	31.15	152.92	71.83	132.85	57.04	153.18	9.34	152.77

Annual Runoff in MCM : 730.18

Peak Observed Discharge = 1579.2 cumecs on 13/7/2017 Corres. Water Level 152.5 m

Lowest Observed Discharge = 0cumecs on 23/2/2018 Corres. Water Level 152.51 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge #:Discarded Discharge (values changed as per rating curve)

Note:Missing values ignored while arriving at Annual Runoff

Stage Discharge Sheet for Kundi at Kogaon for the period 2017-18

Day	December		January		February		March		April		May	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	2.88	152.63	5.6	152.69	9.92	152.77	0	152.48	0	152.51	0	152.08
2	2.85	152.63	5.69	152.69	4	152.77	0	152.48	0	152.5	0	152.33
3	2.82	152.63	5.65	152.69	3.5	152.74	0	152.48	0	152.47	0	152.39
4	2.91	152.63	5.58	152.69	3	152.73	0	152.5	0	152.45	0	152.32
5	0	152.49	5.71	152.69	6.44	152.72	0	152.5	0	152.42	0	152.31
6	0	152.49	5.55	152.69	6.17	152.72	0	152.52	0	152.4	0	152.3
7	0	152.49	5.70	152.70	6.26	152.72	0	152.54	0	152.39	0	152.29
8	0	152.49	6.1	152.71	6.1	152.72	0	152.55	0	152.37	0	152.28
9	0	152.49	5.85	152.73	7.04	152.73	0	152.55	0	152.35	0	152.3
10	0	152.49	6.35	152.73	7.34	152.74	0	152.55	0	152.36	0	152.29
11	0	152.48	6.23	152.73	0	152.74	0	152.55	0	152.34	0	152.28
12	0	152.48	7.14	152.74	7.18	152.74	0	152.56	0	152.37	0	152.23
13	5.12	152.72	7.18	152.74	6.88	152.74	0	152.55	0	152.38	0	152.2
14	2.09	152.59	6.89	152.74	0	152.74	0	152.55	0	152.37	0	152.19
15	5.88	152.68	6.44	152.73	7.26	152.74	0	152.53	0	152.37	0	152.14
16	5.91	152.68	7	152.73	17.57	152.68	0	152.54	0	152.36	0	152.12
17	4.85	152.65	7.2	152.74	5.51	152.68	0	152.54	0	152.36	0	152.1
18	4.68	152.62	8.1	152.74	0	152.64	0	152.54	0	152.35	0	152.08
19	4.64	152.62	10.31	152.77	3.77	152.61	0	152.56	0	152.35	0	152.05
20	4.53	152.62	9.52	152.76	0	152.53	0	152.56	0	152.34	0	152.02
21	3.71	152.63	8.50	152.75	0	152.56	0	152.55	0	152.35	0	152.02
22	4.19	152.63	7.3	152.74	0	152.51	0	152.54	0	152.32	0	152.02
23	3.73	152.63	7.23	152.74	0	152.51	0	152.53	0	152.31	0	152.02
24	4.12	152.65	6.19	152.72	0	152.48	0	152.54	0	152.3	0	152.02
25	4.70	152.66	5.06	152.68	0	152.48	0	152.55	0	152.29	0	152.02
26	5.67	152.69	5.04	152.68	0	152.48	0	152.56	0	152.27	0	152
27	6.08	152.71	5.04	152.68	0	152.49	0	152.54	0	152.2	0	152
28	6.32	152.73	5.10	152.67	0	152.49	0	152.55	0	152.14	0	152
29	6.96	152.74	5.15	152.68			0	152.54	0	152.13	0	152
30	6.14	152.72	6.08	152.72			0	152.53	0	152.12	0	152
31			9.93	152.77			0	152.52			0	152
Ten-Daily Mean												
I Ten-Daily	1.15	152.55	4.64	122.16	5.98	152.74	0	152.51	0	152.42	0	152.29
II Ten-Daily	3.28	137.35	6.91	137.47	4.82	152.68	0	152.55	0	152.36	0	152.14
III Ten-Daily	3.89	111.04	4.72	111.07	0	152.5	0	152.54	0	152.24	0	152.01
Monthly												
Min.	0	152.48	5.04	152.68	0	152.48	0	152.48	0	152.12	0	152
Max.	6.96	152.74	10.31	152.77	17.57	152.77	0	152.56	0	152.51	0	152.39
Mean	2.77	133.65	5.43	123.57	3.6	152.64	0	152.53	0	152.34	0	152.15

Annual Runoff in mm : 186.32

Peak Computed Discharge = 0 cumecs Corres. Water Level 0 m

Lowest Computed Discharge = 1000000cumecs Corres. Water Level 0 m

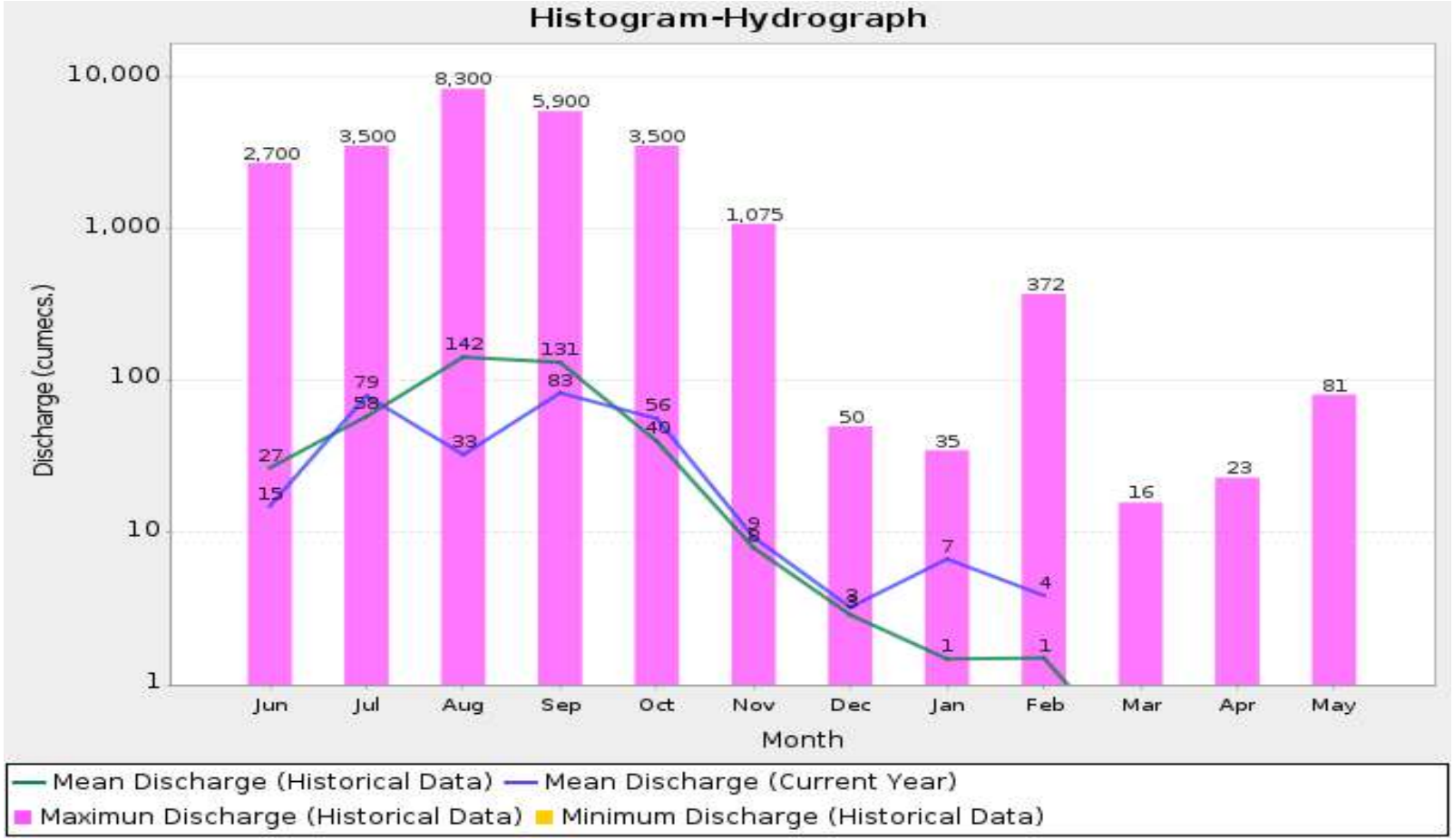
Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge #:Discarded Discharge (values changed as per rating curve)

Note:Missing values ignored while arriving at Annual Runoff

Histogram- Hydrograph for Water Year : 2017-18 (Data considered : 1978-2018)

Station Name : Kundi at Kogaon (010215025) Division : Narmada Division, Bhopal

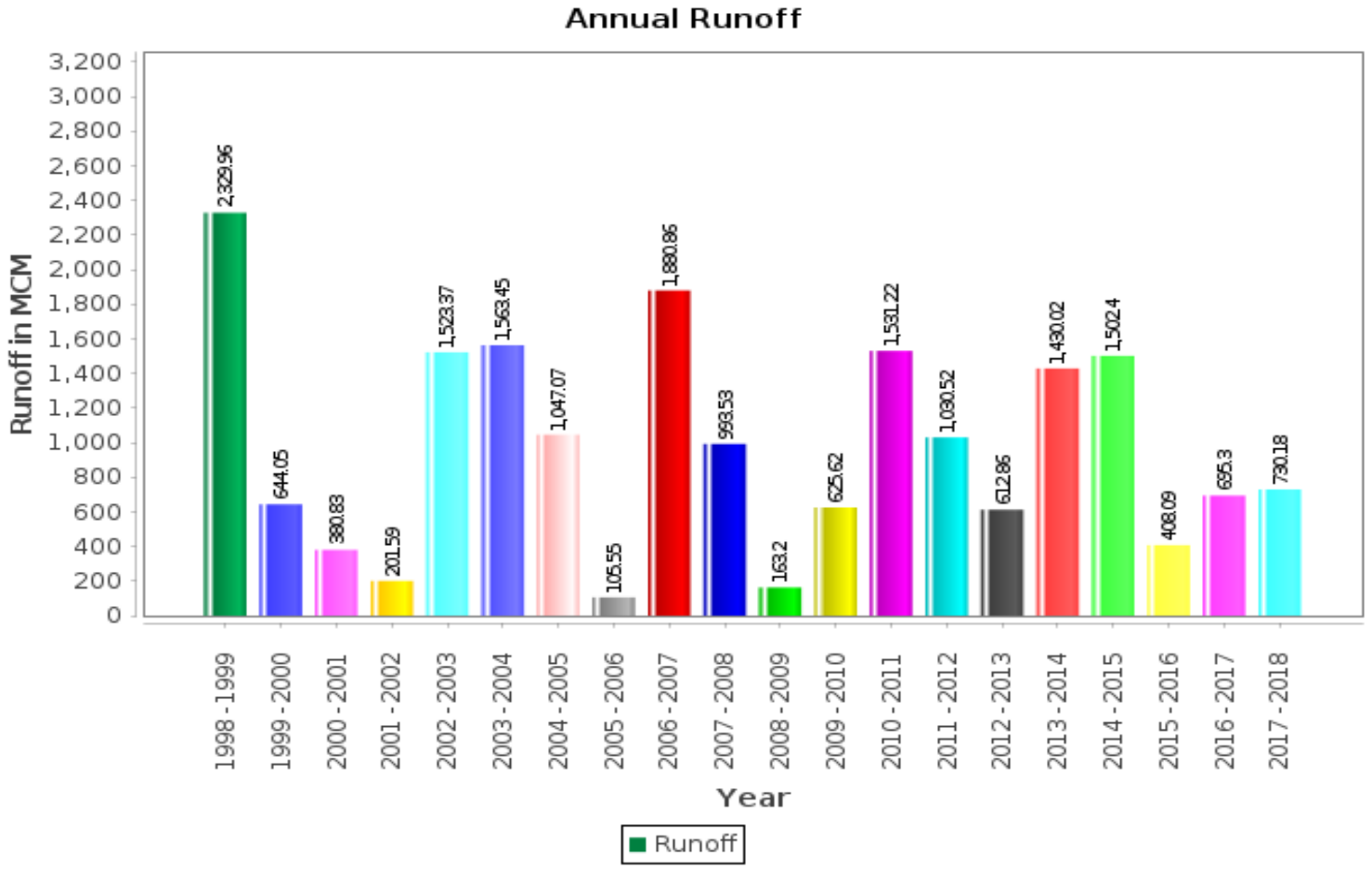
Local River : Kundi Sub-Division :MNSD III, CWC Indore



Annual Runoff Values for the period (1978 – 2018)

Station Name : Kundi at Kogaon (010215025) Division : Narmada Division, Bhopal

Local River : Kundi Sub-Division :MNSD III, CWC Indore

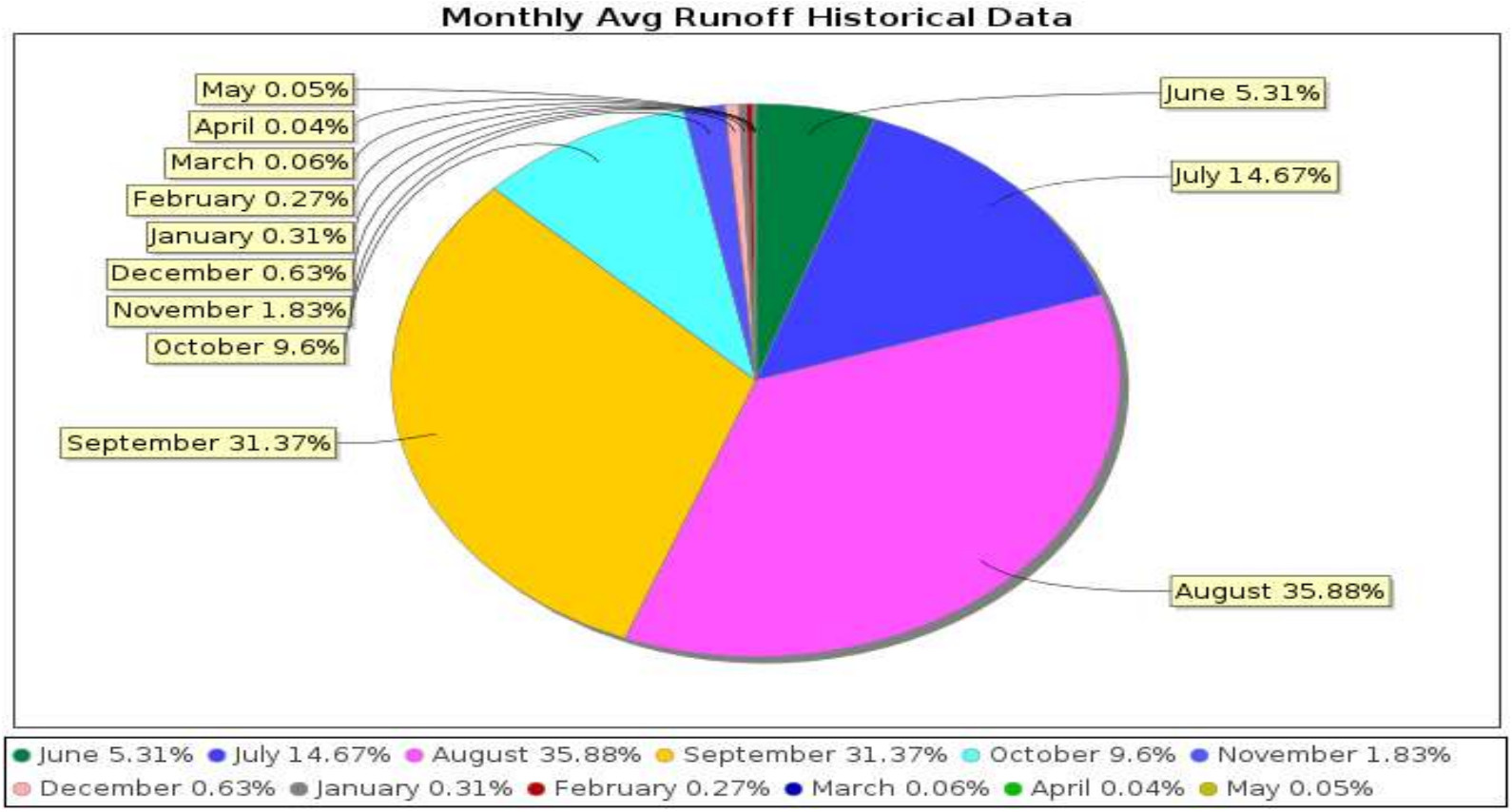


Note: Missing values have not been considered while arriving at Annual Runoff

Monthly Average Runoff based on period (1978 – 2018)

Station Name : Kundi at Kogaon (010215025) Division : Narmada Division, Bhopal

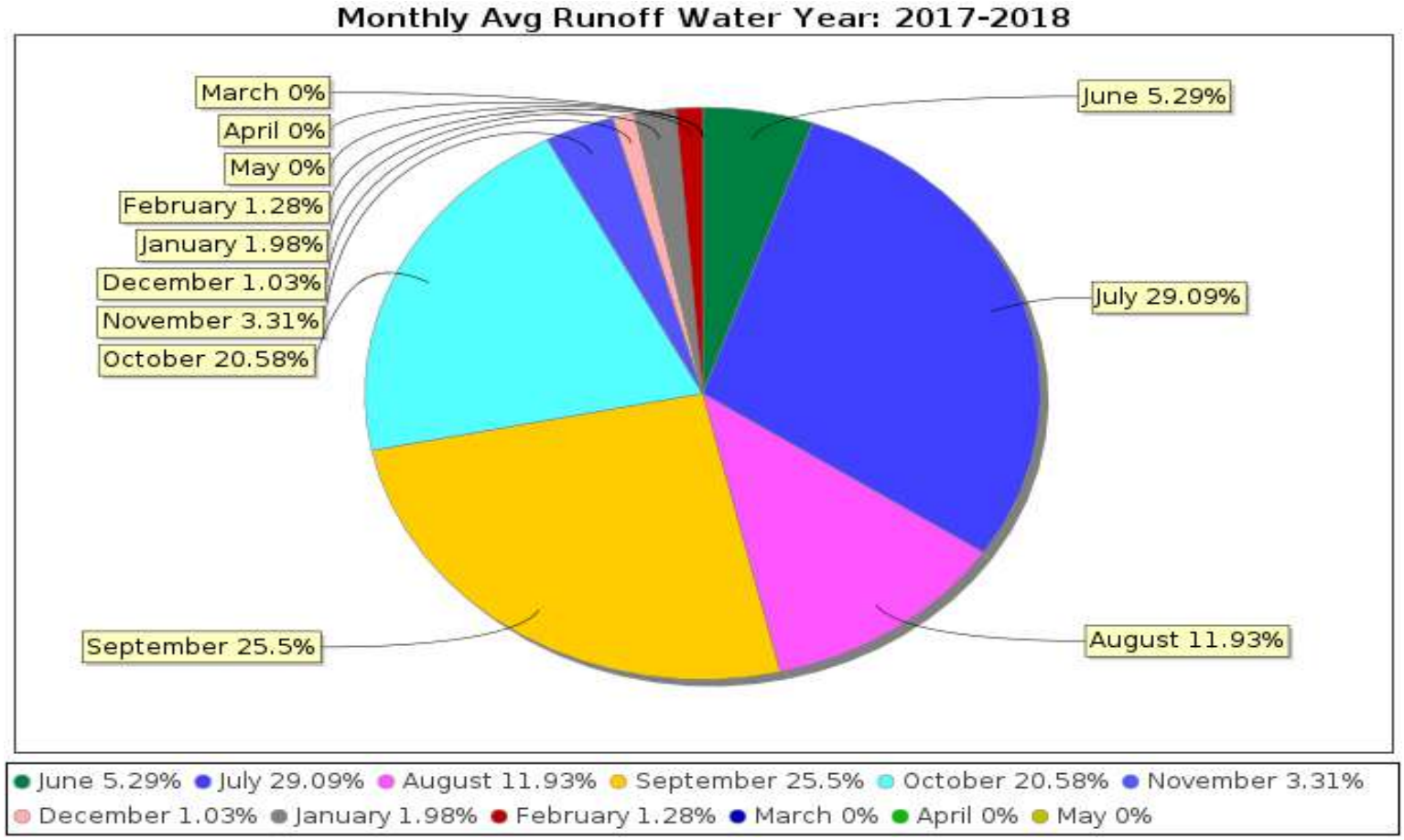
Local River : Kundi Sub-Division :MNSD III, CWC Indore



Monthly Runoff for the Year (2017-18)

Station Name : Kundi at Kogaon (010215025) Division : Narmada Division, Bhopal

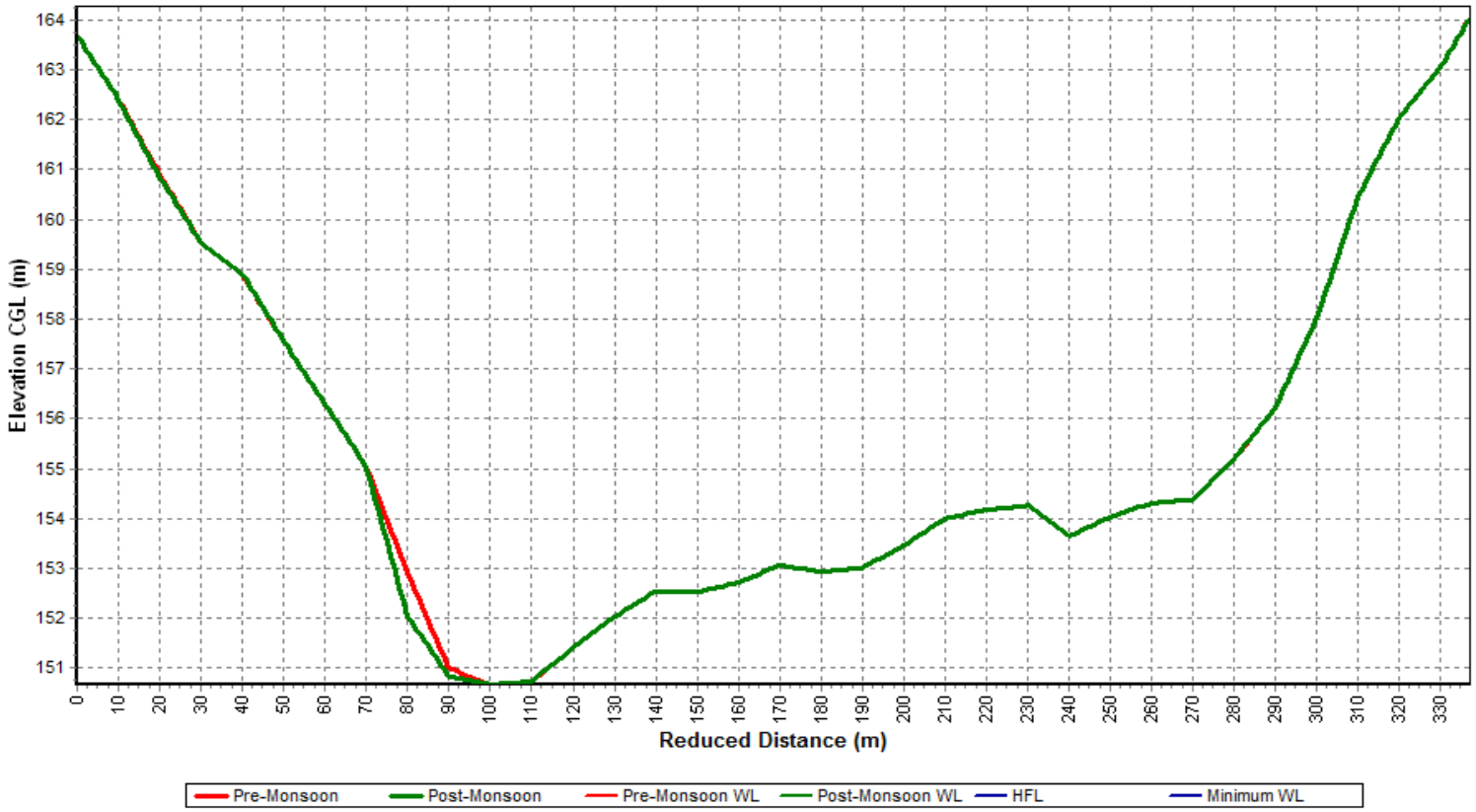
Local River : Kundi Sub-Division :MNSD III, CWC Indore



Pre-Monsoon & Post-Monsoon X-Section for Water Year (2017-18)

Station Name : Kundi at Kogaon (010215025) Division : Narmada Division, Bhopal

Local River : Kundi Sub-Division : MNSD III CWC Indore



4.5 Narmada at Handia

History Sheet

HISTORY SHEET (DISCHARGE AND WATER LEVEL)

			Water Year	:	2017 - 2018
Site	:	Handia	**Code**	:	014-NDBHP
State	:	Madhya Pradesh	**District**	:	Harda
Basin	:	NARMADA	**Independent River**	:	Narmada
Tributary	:	-	**Sub Tributary**	:	-
Sub-Sub Tributary	:	-	**Local River**	:	Narmada
Division	:	Narmada Division(ND), Bhopal	**Sub-Division**	:	Middle Narmada Sub-Division-II, Bhopal
Drainage Area	:	54027.0 Sq. Km.	**Bank**	:	Left
Latitude	:	22°29'24''	**Longitude**	:	76°59'36''
Current Zero of Gauge (m)	:	0			

CATEGORY		Opening Date	Closing Date
Gauge	:	09/02/1977	
Discharge	:	26/04/1977	
Sediment	:	11/12/1977	
Water Quality	:		

Reduced Level	Opening Date	Closing Date
258.0	05/01/2017	31/12/2018
258.0	01/01/2019	31/12/2019
0.0	19/02/2019	-
258.0	30/06/2016	31/12/2017
258.0	09/02/1977	14/10/2016
258.0	14/10/2016	05/01/2017

Annual Maximum / Minimum discharge with corresponding Water Level (m.s.l)						
	Maximum			Minimum		
Year	Q (cumecs)	WL (m)	Date	Q (cumecs)	WL (m)	Date
1976-1977	36.6	259.045	05/05/1977	18.5	258.985	20/05/1977
1977-1978	11000	269	15/09/1977	17.4	258.985	02/06/1977
1978-1979	19220	269.74	17/08/1978	33.6	259.24	07/06/1978
1979-1980	14350	268.48	11/08/1979	16.5	260.445	25/05/1980
1980-1981	20157.3	271.555	30/08/1980	20	260.54	01/06/1980
1981-1982	10199.2	267.545	10/08/1981	25.8	260.585	15/06/1981
1982-1983	17060	270.25	23/08/1982	30	260.57	12/06/1982
1983-1984	19950	270.76	10/09/1983	31.3	260.595	30/05/1984
1984-1985	26240	273.58	19/08/1984	23	260.555	26/05/1985
1985-1986	15600	269.74	09/08/1985	29.4	260.54	26/05/1986
1986-1987	23060	272.58	24/07/1986	28.8	260.54	16/06/1986
1987-1988	13661	269.83	28/08/1987	18.47	260.45	29/06/1987
1988-1989	20500	271.6	06/08/1988	12.12	260.44	30/05/1989
1989-1990	13200	268.52	08/08/1989	11.96	260.44	01/06/1989
1990-1991	18000	270.31	23/08/1990	37.66	260.68	12/06/1990
1991-1992	20780	270.685	26/08/1991	57.05	260.71	15/05/1992
1992-1993	9800	267.68	14/09/1992	53.2	260.695	17/03/1993
1993-1994	12300	269.15	06/08/1993	45.2	260.6	12/06/1993
1994-1995	24040	271.75	06/09/1994	100.8	261.035	22/01/1995
1995-1996	10200	267.88	12/08/1995	70.5	260.8	26/05/1996
1996-1997	14300	269.82	27/07/1996	45	260.73	23/06/1996
1997-1998	15000	270.22	26/07/1997	47.4	260.7	14/06/1997
1998-1999	18500	271.56	15/09/1998	65.2	260.68	29/05/1999
1999-2000	29250	272.78	20/09/1999	66	260.85	20/05/2000
2000-2001	5450	266.18	30/07/2000	99.01	260.95	07/06/2000
2001-2002	5950	266.5	16/08/2001	114	260.69	06/04/2002
2002-2003	14800	269.65	19/08/2002	60.41	260.76	30/05/2003
2003-2004	13240	270.08	28/07/2003	60	260.76	01/06/2003
2004-2005	14625	271	23/08/2004	53.5	260.85	23/05/2005
2005-2006	11761.64	268.935	06/07/2005	47.56	260.8	12/06/2005
2006-2007	21341	271.06	15/08/2006	56.52	260.68	29/06/2006
2007-2008	10883.78	268.685	09/07/2007	42.52	260.51	20/05/2008
2008-2009	6246	266.57	03/08/2008	32.41	261.27	01/02/2009
2009-2010	20785.61	271.21	11/09/2009	100.52	260.66	09/04/2010
2010-2011	6586.8	266.66	06/09/2010	77.58	260.76	06/06/2010

2011-2012	8044.14	267.85	24/07/2011	69.25	260.71	27/05/2012
2012-2013	21415	273.16	07/08/2012	45.3	260.61	08/06/2012
2013-2014	31879.9	274.15	24/08/2013	113.76	260.8	18/05/2014
2014-2015	4908.59	266.255	08/09/2014	65.63	261.98	31/08/2014
2015-2016	5371.43	266.625	21/01/2016	72.8	260.7	04/04/2016
2016-2017	14900.8	270.09	13/07/2016	72	260.44	17/05/2017
2017-2018	3059.3	264.385	21/07/2017	20	260.29	22/04/2018

Stage Discharge Sheet for Narmada at Handia for the period 2017-18

Day	June		July		August		September		October		November	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	124	260.91	240	261.32	524	262.13	957.9	262.69	340	261.49	254.3	261.26
2	120	260.89	210	261.22	433	261.99	680	262.32	330	261.4	247.9	261.24
3	115	260.88	218	261.24	346	261.82	480	262.07	334	261.34	221	261.18
4	116	260.81	252	261.36	313	261.66	358	261.86	199	261.26	215	261.13
5	112	260.78	308	261.5	304	261.58	338	261.77	188	261.2	217.1	261.1
6	115	260.8	302	261.5	285	261.45	294	261.68	177	261.16	210.5	261.06
7	100	260.73	270	261.4	251.6	261.37	250	261.53	160	261.12	205	261.03
8	101	260.75	240	261.32	250	261.31	214	261.2	150	261.1	218.3	261.1
9	104	260.75	250	261.26	242.4	261.25	167	261.18	142	261.07	218.4	261.1
10	98	260.71	202	261.2	250	261.3	160	261.16	152	261.05	210	261.07
11	96	260.7	180	261.15	252	261.4	201	261.2	146	261.05	200	261.02
12	95	260.68	178	261.14	338	261.69	223	261.26	152	261.1	166.4	260.95
13	92	260.66	177	261.12	310	261.6	348	261.55	152	261.09	160.4	260.9
14	90	260.65	220	261.23	241	261.48	348	261.57	154	261.09	155.3	260.85
15	95	260.69	265	261.38	240	261.4	450	261.85	155	261.1	153.4	260.8
16	96	260.7	440	261.68	191	261.29	643	262.2	147	261.09	152.4	260.8
17	98	260.73	263	261.36	177	261.24	470	262.03	141	261.06	151.7	260.79
18	99	260.74	200	261.23	145	261.17	415	261.83	140	261.05	155	260.81
19	98	260.73	216	261.22	326	261.37	445	261.83	135	261.06	156.4	260.85
20	100	260.74	536	262.08	430	261.98	476	261.99	137	261.07	158.9	260.9
21	100	260.76	3059.3	264.39	420	261.94	533	262.02	130	261.05	160	260.89
22	98	260.74	2319.7	264.05	331	261.7	683.3	262.31	130	261.05	156.3	260.85
23	95	260.73	2300	264.04	307	261.65	711.1	262.4	117	261.04	152	260.78
24	96	260.73	1755.6	263.57	257	261.52	1300	262.09	123	261.05	151.4	260.78
25	98	260.74	1454.8	263.17	289	261.47	862.9	262.65	119	261.03	155	260.82
26	100	260.75	991.2	262.74	313	261.36	692	262.33	117	261.03	153.9	260.83
27	118	260.87	732.1	262.69	330	261.71	519.2	262.11	106	261.04	160.8	260.9
28	117	260.83	730.3	262.54	369	261.74	444	261.88	109	261.04	200	261.16
29	118	260.83	742.3	262.53	662	262.27	363	261.71	110	261.04	221.7	261.17
30	140	261.05	1800	263.39	1587.8	263.45	350	261.59	112	261.04	210	261.12
31			713	262.51	978.8	262.71			109	261.03		
Ten-Daily Mean												
I Ten-Daily	110.5	260.8	249.2	261.33	319.9	261.59	389.89	261.75	217.2	261.22	221.75	261.13
II Ten-Daily	95.9	260.7	267.5	261.36	265	261.46	401.9	261.73	145.9	261.08	160.99	260.87
III Ten-Daily	108	260.8	1508.94	263.24	531.33	261.96	645.85	262.11	116.55	261.04	172.11	260.93
Monthly												
Min.	90	260.65	177	261.12	145	261.17	160	261.16	106	261.03	151.4	260.78
Max.	140	261.05	3059.3	264.39	1587.8	263.45	1300	262.69	340	261.49	254.3	261.26
Mean	104.8	260.77	675.21	261.98	372.08	261.67	479.21	261.86	159.88	261.11	184.95	260.97

Annual Runoff in MCM : 6400.44

Peak Observed Discharge = 3059.3 cumecs on 21/7/2017 Corres. Water Level 264.39 m

Lowest Observed Discharge = 20cumecs on 4/4/2018 Corres. Water Level 260.33 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge
#:Discarded Discharge (values changed as per rating curve)
Note:Missing values ignored while arriving at Annual Runoff

Stage Discharge Sheet for Narmada at Handia for the period 2017-18

Day	December		January		February		March		April		May	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	104.9	260.77	107.4	260.89	119.6	261.04	41	260.57	22	260.33	22.9	260.3
2	105	260.78	111.5	260.88	118.9	261.03	42	260.58	23	260.33	23.7	260.33
3	105	260.78	112.5	260.9	114	261.03	42	260.58	23.4	260.33	44.8	260.45
4	111.96	260.82	112.1	260.91	112	261.02	42	260.58	20	260.33	47	260.51
5	113.4	260.85	108.9	260.88	110	260.99	42.2	260.58	26	260.34	60	260.6
6	117.6	260.95	109.5	260.87	95	260.98	41.9	260.57	28.5	260.36	40	260.5
7	120.2	261.1	110	260.87	83.1	260.95	42.2	260.57	32.4	260.4	34.6	260.42
8	119	261.1	110.4	260.87	76.8	260.85	40	260.56	35	260.42	25	260.37
9	116.3	260.9	78.9	260.91	78.3	260.82	38	260.54	36	260.44	26	260.37
10	115	260.88	78.2	260.88	84.9	260.8	37	260.5	37	260.45	24.6	260.34
11	115.4	260.88	77.6	260.88	72	260.74	35	260.47	40	260.51	24.2	260.34
12	113.3	260.87	80	260.9	71.4	260.71	33.9	260.44	53.9	260.57	28	260.37
13	111.2	260.84	85	260.93	66	260.62	38.9	260.44	42.1	260.54	28	260.38
14	112.7	260.85	90	260.96	65	260.6	39.6	260.44	40	260.45	24.1	260.37
15	113.3	260.86	87.9	260.95	60.5	260.57	39.6	260.44	35	260.4	25	260.37
16	110.3	260.84	88.2	260.94	45.5	260.55	39.5	260.43	28.1	260.39	81.3	260.7
17	120	260.95	87.9	260.94	45	260.55	39.7	260.43	24.3	260.37	85	260.76
18	123	261.1	87.9	260.93	45	260.54	38	260.43	27.1	260.34	82.6	260.78
19	200	261.22	87.1	260.91	48.2	260.56	35	260.42	26.7	260.34	91	260.8
20	205.3	261.28	90.6	260.97	45.3	260.53	33	260.42	25.1	260.3	95	260.83
21	117.8	261.05	110	261.03	47	260.54	32	260.42	20.9	260.32	95	260.84
22	113.3	260.98	113.2	261.04	59.4	260.6	25.2	260.4	20	260.29	95	260.85
23	110.3	260.95	111.7	261.02	60.3	260.61	26.4	260.38	22.5	260.29	97	260.87
24	112	260.96	106.2	260.99	48.2	260.61	21.4	260.36	25.6	260.29	88	260.87
25	115	260.95	117.2	261.07	47	260.6	25	260.35	20.6	260.28	83	260.79
26	110.3	260.95	120	261.08	47.2	260.58	23	260.35	21.5	260.28	82.5	260.8
27	112.8	260.96	121	261.08	40.7	260.57	22	260.35	22	260.28	98	260.9
28	112.8	260.96	114	261.04	40	260.57	23	260.34	21.9	260.28	104	260.96
29	115.8	260.97	112.4	261.01			22	260.34	22	260.27	101	260.93
30	111.7	260.93	112.9	261.01			22	260.34	22	260.27	97.2	260.9
31	110	260.9	116.1	261.02			22.5	260.34			98	260.9
Ten-Daily Mean												
I Ten-Daily	112.84	260.89	103.94	260.89	99.26	260.95	40.83	260.56	28.33	260.37	34.86	260.42
II Ten-Daily	132.45	260.97	86.22	260.93	56.39	260.6	37.22	260.44	34.23	260.42	56.42	260.57
III Ten-Daily	112.89	260.96	114.06	261.04	48.72	260.58	24.05	260.36	21.9	260.29	94.43	260.87
Monthly												
Min.	104.9	260.77	77.6	260.87	40	260.53	21.4	260.34	20	260.27	22.9	260.3
Max.	205.3	261.28	121	261.08	119.6	261.04	42.2	260.58	53.9	260.57	104	260.96
Mean	119.39	260.94	101.41	260.95	68.12	260.71	34.03	260.45	28.15	260.36	61.9	260.62

Annual Runoff in mm : 118.47

Peak Computed Discharge = 2300 cumecs on 23/7/2017 Corres. Water Level 264.04 m

Lowest Computed Discharge = 20cumecs on 22/4/2018 Corres. Water Level 260.29 m

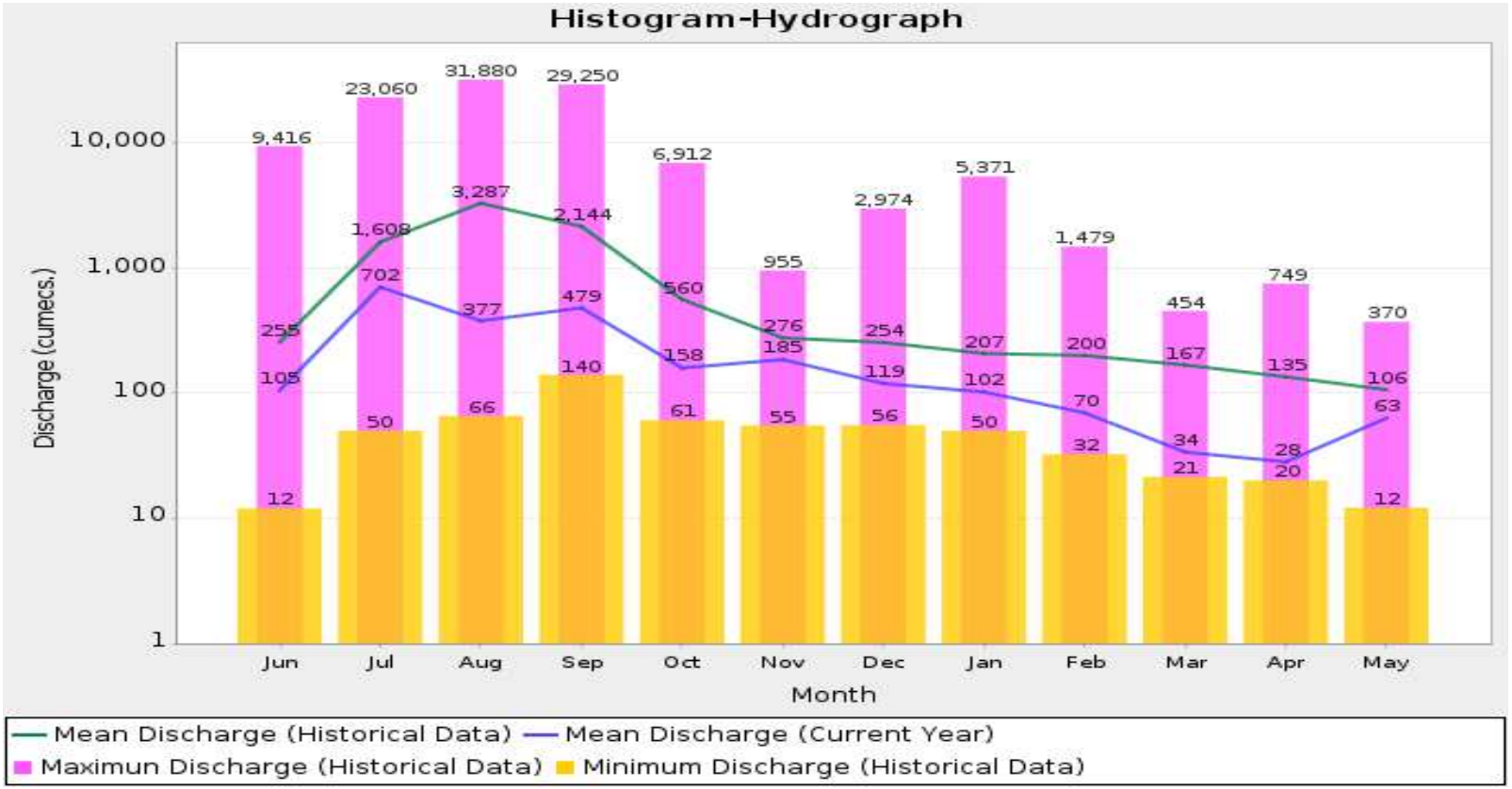
Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge #:Discarded Discharge (values changed as per rating curve)

Note:Missing values ignored while arriving at Annual Runoff

Histogram- Hydrograph for Water Year : 2017-18 (Data considered : 1977-2018)

Station Name : Narmada at Handia (010215022) Division : Narmada Division, Bhopal

Local River : Narmada Sub-Division :MNSD II, CWC Bhopal



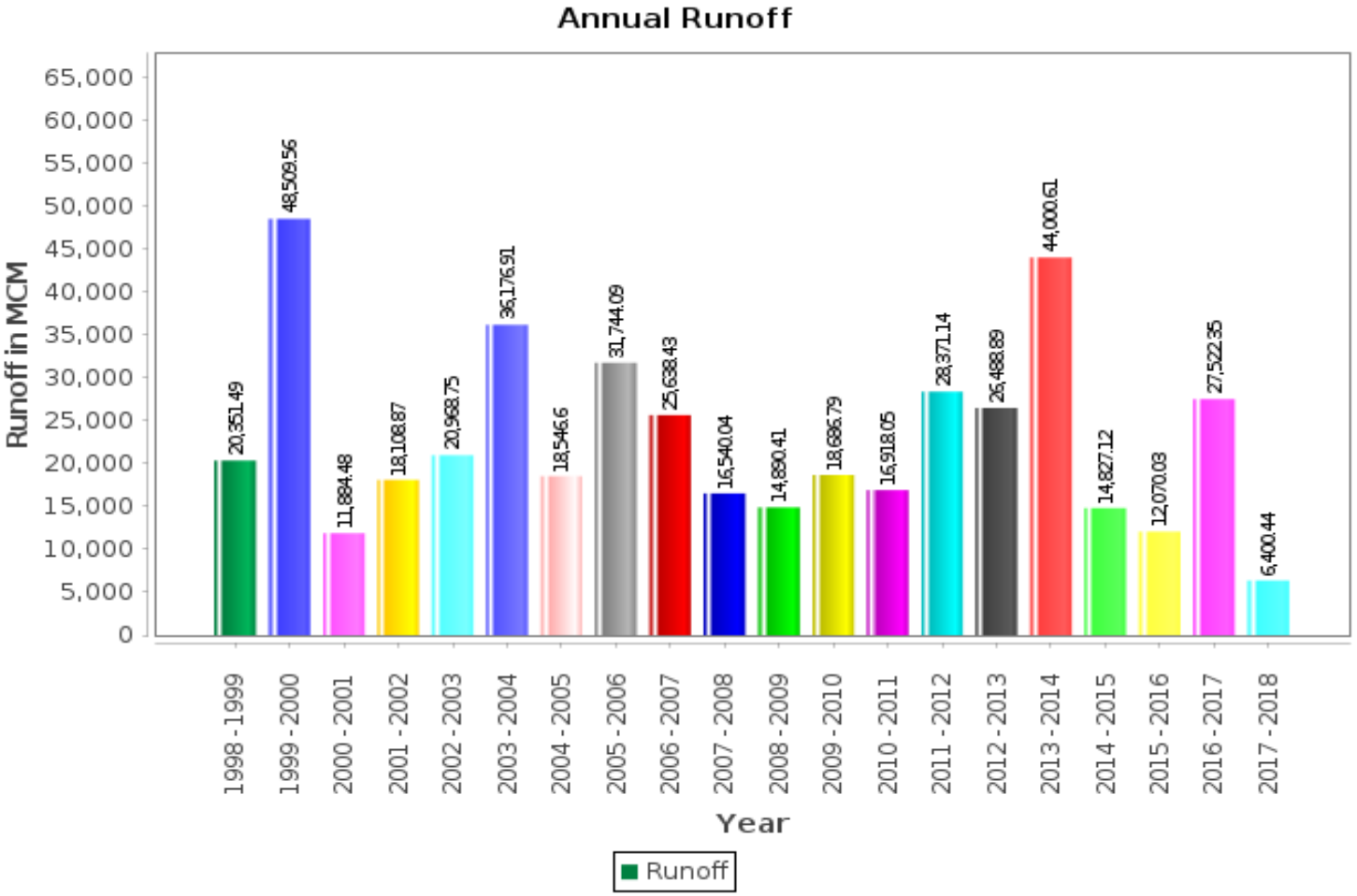
Annual Runoff Values for the period (1977 – 2018)

Station Name : Narmada at Handia (010215022)

Division : Narmada Division, Bhopal

Local River : Narmada

Sub-Division :MNSD II, CWC Bhopal

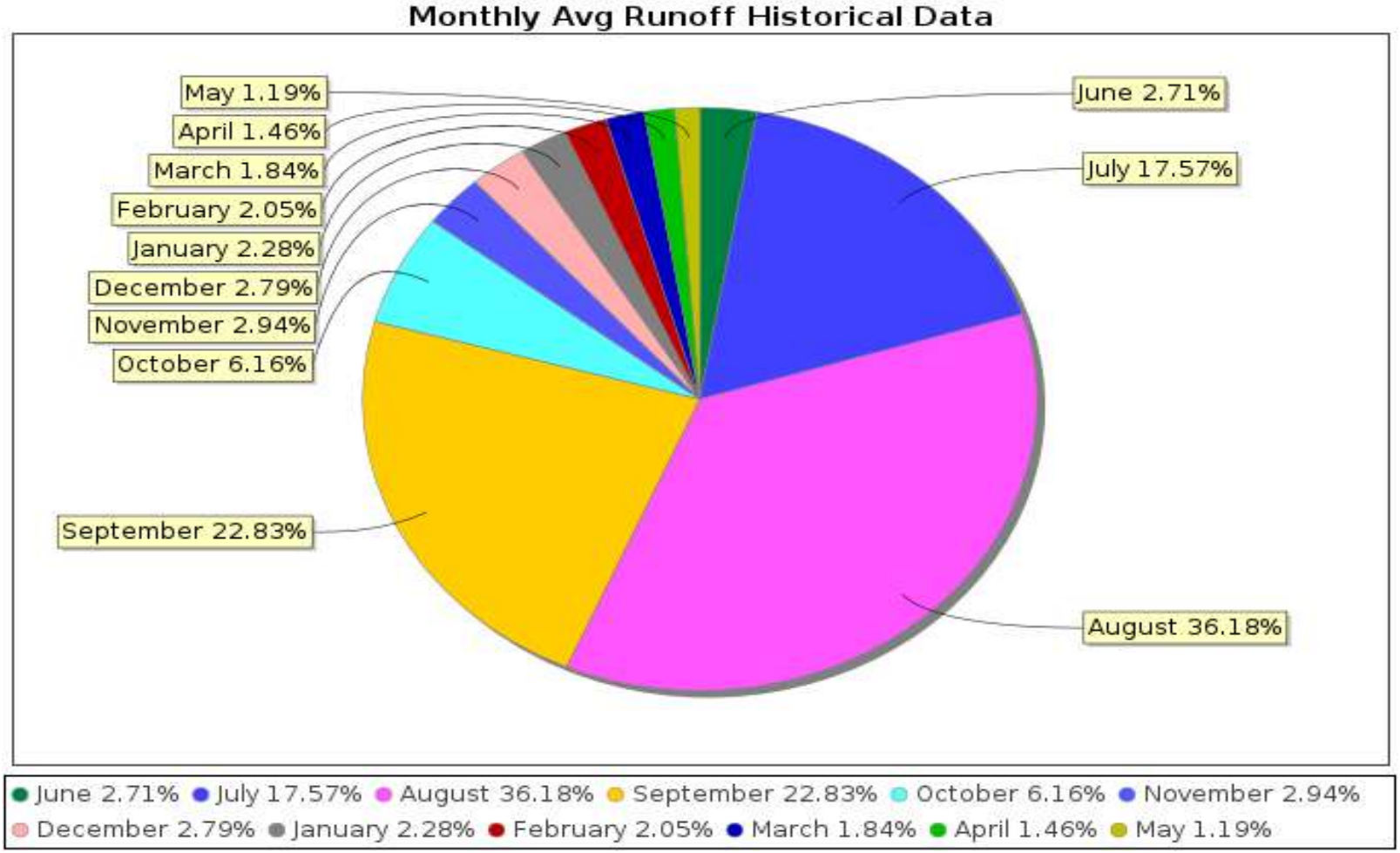


Note: Missing values have not been considered while arriving at Annual Runoff

Monthly Average Runoff based on period (1977 – 2018)

Station Name : Narmada at Handia (010215022) Division : Narmada Division, Bhopal

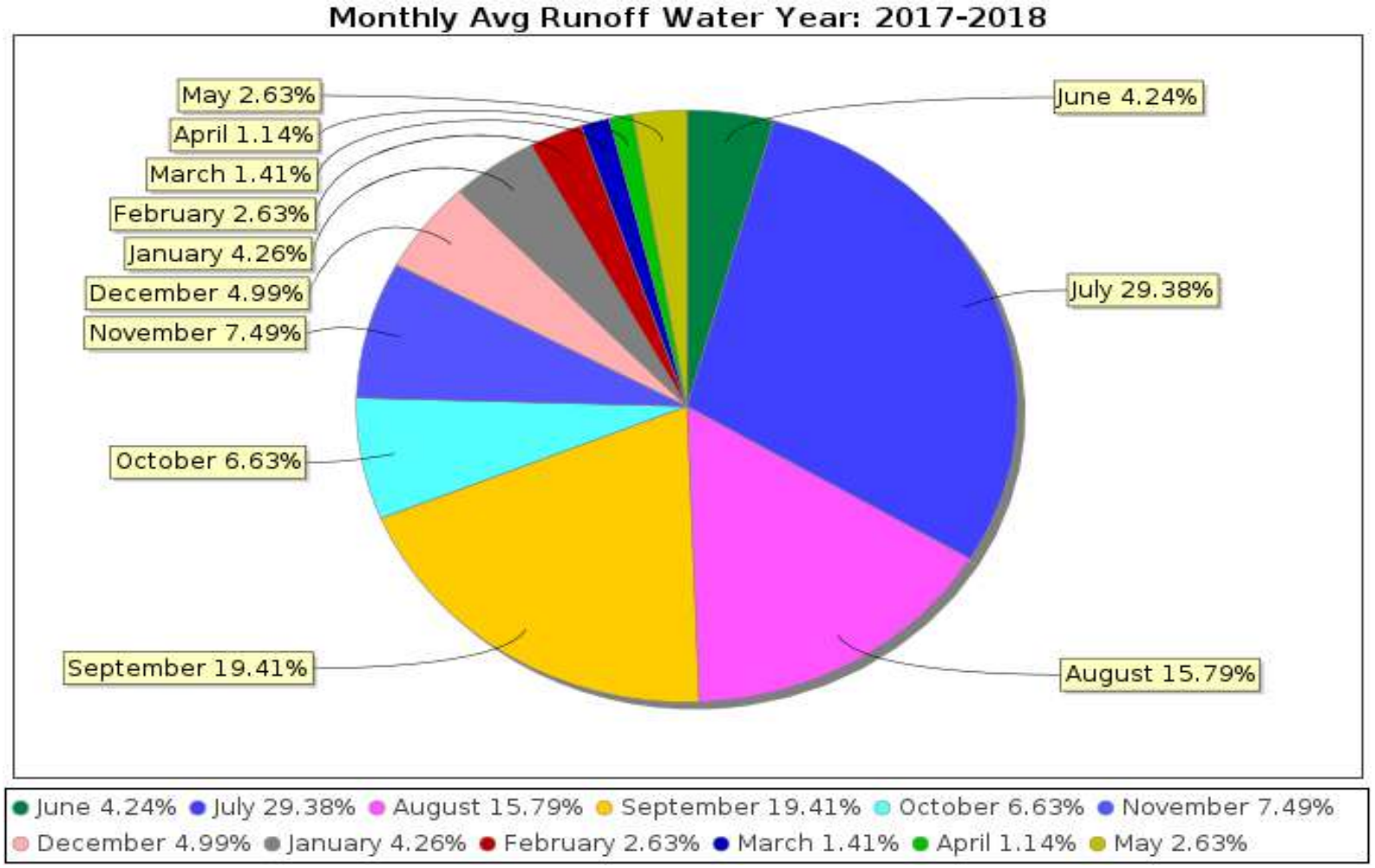
Local River : Narmada Sub-Division :MNSD II, CWC Bhopal



Monthly Runoff for the Year (2017-18)

Station Name : Narmada at Handia (010215022) Division : Narmada Division, Bhopal

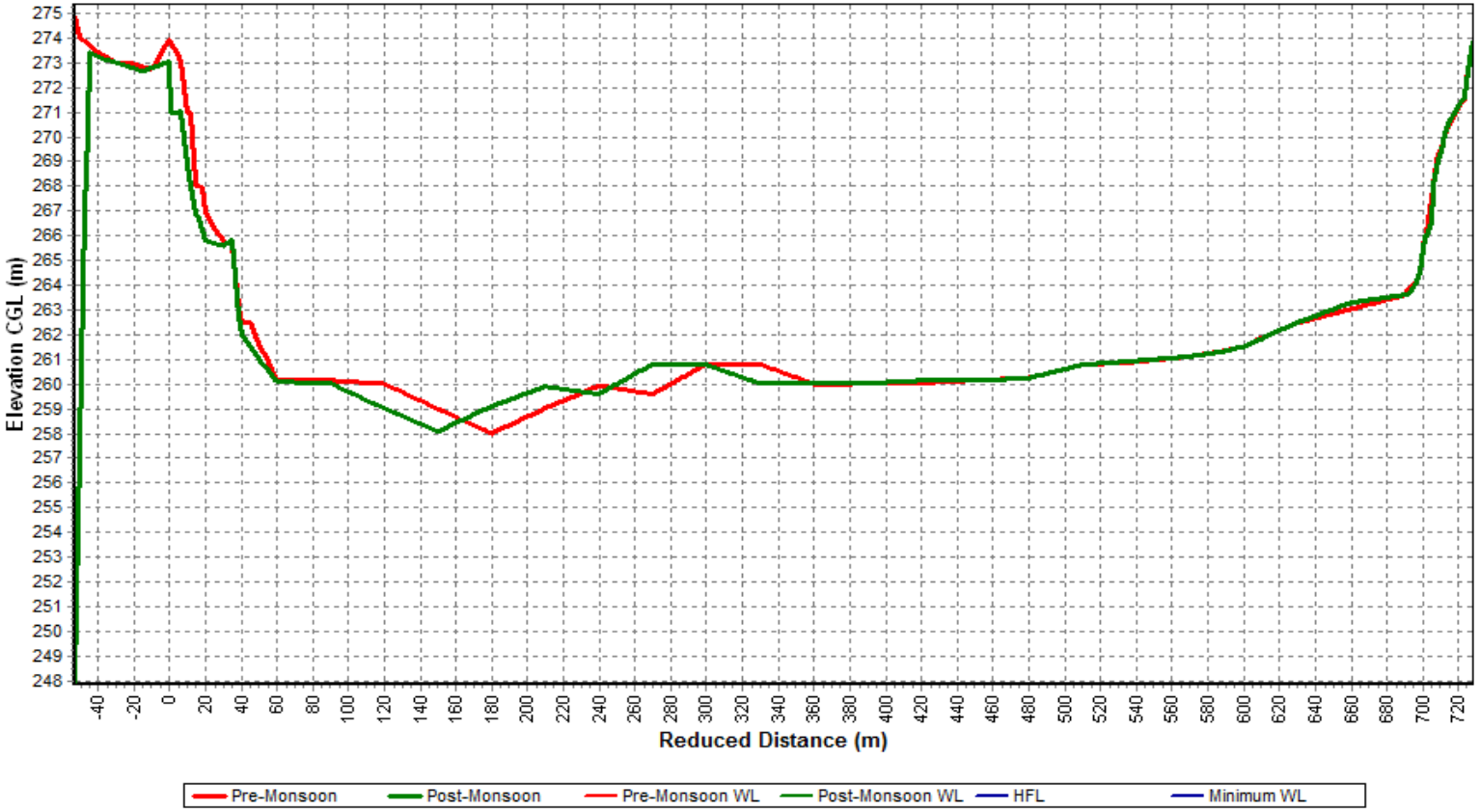
Local River : Narmada Sub-Division :MNSD II, CWC Bhopal



Pre-Monsoon & Post-Monsoon X-Section for Water Year (2017-18)

Station Name : Narmada at Handia (010215022) Division : Narmada Division, Bhopal

Local River : Narmada Sub-Division :MNSD II, CWC Bhopal



4.6 Ganjal at Chhidgaon

History sheet

HISTORY SHEET (DISCHARGE AND WATER LEVEL)

			Water Year	:	2017 - 2018
Site	:	Chhidgaon	**Code**	:	004-NDBHP
State	:	Madhya Pradesh	**District**	:	Hoshangabad
Basin	:	NARMADA	**Independent River**	:	Narmada
Tributary	:	Ganjal	**Sub Tributary**	:	-
Sub-Sub Tributary	:	-	**Local River**	:	Ganjal
Division	:	Narmada Division(ND), Bhopal	**Sub-Division**	:	Middle Narmada Sub-Division-II, Bhopal
Drainage Area	:	1729.0 Sq. Km.	**Bank**	:	Left
Latitude	:	22°24'20''	**Longitude**	:	77°18'27''
Current Zero of Gauge (m)	:	287			

CATEGORY		Opening Date	Closing Date
Gauge	:	22/12/1976	
Discharge	:	22/12/1976	
Sediment	:		
Water Quality	:		

Reduced Level	Opening Date	Closing Date
287.0	03/06/2014	31/05/2018
287.0	31/05/2018	-
287.0	02/12/1976	03/06/2014
287.0	05/01/2017	31/05/2018
287.0	22/12/1976	31/12/1976

Annual Maximum / Minimum discharge with corresponding Water Level (m.s.l)						
	Maximum			Minimum		
Year	Q (cumecs)	WL (m)	Date	Q (cumecs)	WL (m)	Date
1976-1977	3.4	287.68	07/03/1977	0.2	287.36	22/05/1977
1977-1978	2553.8	293.3	14/09/1977	0	287.835	11/04/1978
1978-1979	3813.4	296.5	29/08/1978	0	287.8	01/06/1978
1979-1980	1235	291.565	10/08/1979	0	287.43	01/06/1979
1980-1981	1375	295.1	03/08/1980	0.2	287.515	01/06/1980
1981-1982	490.8	290.265	10/08/1981	0.4	287.41	01/06/1981
1982-1983	876	291.26	23/08/1982	0.4	287.445	16/05/1983
1983-1984	2650	295.55	03/09/1983	0.3	287.42	06/06/1983
1984-1985	4470	299	10/08/1984	0.3	287.49	18/05/1985
1985-1986	1690	291.9	09/08/1985	0.3	287.485	01/06/1985
1986-1987	2675	295.99	15/08/1986	0.2	287.465	01/06/1986
1987-1988	1275	292.42	28/08/1987	0.36	287.17	25/05/1988
1988-1989	1300	292.54	04/08/1988	0.3	287.16	07/06/1988
1989-1990	863.5	291	29/06/1989	0.44	287.25	28/05/1990
1990-1991	3450	296.48	23/08/1990	0.1	287.35	01/06/1990
1991-1992	2060	294.2	30/07/1991	0.09	287.335	08/05/1992
1992-1993	1925	294.2	17/08/1992	0.02	287.335	01/06/1992
1993-1994	3700	297.2	16/07/1993	0.1	287.38	01/06/1993
1994-1995	5350	299.15	06/09/1994	0.38	287.34	01/06/1994
1995-1996	1320	292.505	02/09/1995	0.11	287.525	14/11/1995
1996-1997	2530	295.3	27/07/1996	0.2	287.45	05/06/1996
1997-1998	4500	298.9	26/07/1997	0.24	287.415	21/05/1998
1998-1999	6660	300.3	15/09/1998	0.17	287.415	15/06/1998
1999-2000	2490	295.62	10/08/1999	0.53	287.36	01/06/1999
2000-2001	960	291.9	13/07/2000	0.4	287.27	20/05/2001
2001-2002	1700	294	15/08/2001	0.27	287.26	19/05/2002
2002-2003	1200	292.6	23/08/2002	0.24	287.4	17/07/2002
2003-2004	2380	296.3	27/07/2003	0.31	287.295	07/06/2003
2004-2005	2170	297	22/08/2004	0.5	287.23	06/06/2004
2005-2006	926.52	292.64	01/08/2005	0.37	287.28	31/05/2006
2006-2007	5142.51	296.5	31/08/2006	0.29	287.28	04/06/2006
2007-2008	9625	301.81	08/07/2007	0.09	287.6	06/06/2007
2008-2009	810.87	291.57	11/08/2008	0.02	287.6	02/03/2009
2009-2010	1878.3	293.28	22/07/2009	0	287.5	12/05/2010
2010-2011	270.78	289.95	09/09/2010	0.35	287.37	27/05/2011
2011-2012	815.98	291.4	26/08/2011	0.27	287.31	25/05/2012

2012-2013	832.46	292	06/09/2012	0.42	287.36	06/06/2012
2013-2014	7527.57	300.75	23/08/2013	0.57	287.4	05/06/2013
2014-2015	693.32	291.3	23/07/2014	0	287.55	26/05/2015
2015-2016	1003.84	292.1	05/08/2015	0	287.4	02/03/2016
2016-2017	6050.3	298.5	12/07/2016	1.29	287.46	01/07/2016
2017-2018	338.57	289.9	21/07/2017	0	287.52	02/06/2017

Stage Discharge Sheet for Ganjal at Chhidgaon for the period 2017-18

Day	June		July		August		September		October		November	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	0	287.52	20.8	287.88	37.32	288.05	50.97	288	17	287.86	0	287.65
2	0	287.52	18	287.77	36.33	288.04	21	287.9	16	287.85	0	287.64
3	0	287.51	16.62	287.74	34.48	288	19	287.86	17.34	287.84	0	287.63
4	0	287.51	16.89	287.75	33.77	288	19.66	287.85	16.96	287.82	0	287.62
5	0	287.51	0	287.73	18.09	287.8	14.69	287.83	16.89	287.8	0	287.62
6	0	287.53	18.18	287.78	19	287.81	14.37	287.82	15.59	287.8	0	287.62
7	0	287.53	0	287.71	18.75	287.84	14.28	287.8	15.41	287.79	0	287.61
8	0	287.66	0	287.73	18.08	287.85	16.13	287.83	15	287.79	0	287.6
9	0	287.76	0	287.62	20.62	287.86	17.35	287.85	14.9	287.78	0	287.59
10	0	287.71	0	287.65	21.64	287.87	17	287.85	15.75	287.79	0	287.58
11	0	287.69	0	287.64	18.99	287.85	19.21	287.92	16.27	287.8	0	287.58
12	0	287.68	0	287.62	19.31	287.8	18.34	287.9	15.78	287.78	0	287.56
13	0	287.88	0	287.7	21	287.87	17.48	287.86	15.75	287.78	0	287.55
14	0	287.81	0	287.71	21.01	287.86	50.48	288	17.43	287.8	0	287.53
15	0	287.77	81.83	288.19	19	287.85	49.28	288	56	288.08	0	287.54
16	0	287.75	40	288.1	18.74	287.84	56.52	288.1	17.37	287.8	0	287.54
17	0	287.89	65.67	288.09	18.7	287.84	56	288.1	16.54	287.79	0	287.54
18	0	287.83	17.12	287.85	18.63	287.72	62.42	288.12	16.1	287.78	0	287.53
19	0	287.77	38.01	288.02	21.77	287.88	140.33	288.77	15	287.77	0	287.53
20	0	287.74	66.29	288.3	55	287.15	101.62	288.3	14.88	287.76	0	287.53
21	0	287.7	338.57	289.9	62.26	288.26	57.32	288.1	13.78	287.75	0	287.53
22	0	287.68	92.64	288.6	37.09	288.04	56.2	288.08	13	287.74	0	287.52
23	0	287.65	60	288.28	20.09	287.84	61.9	288.1	12.98	287.73	0	287.52
24	0	287.64	56.98	288.2	23.34	287.9	55	288.05	12.58	287.71	0	287.51
25	0	287.86	49.44	288.1	69.24	288.31	52.31	288.01	12.45	287.7	0	287.5
26	0	287.8	35.99	288.04	60.26	288.1	50.59	288	12.01	287.69	0	287.5
27	0	287.78	88.55	288.65	38	288.05	19.2	287.9	11.55	287.68	0	287.5
28	0	287.73	80.56	288.5	35.72	288	18.59	287.89	11.06	287.67	0	287.5
29	0	288	75.57	288.44	22.43	287.9	17.86	287.88	11	287.67	0	287.5
30	0	288.06	55	288.24	60.75	288.27	17	287.86	10.94	287.66	0	287.5
31			55.53	288.15	53.88	288.05			9.92	287.65		
Ten-Daily Mean												
I Ten-Daily	0	287.58	9.05	287.74	25.81	287.91	20.44	287.86	16.08	287.81	0	287.62
II Ten-Daily	0	287.78	30.89	287.92	23.22	287.77	57.17	288.11	20.11	287.81	0	287.54
III Ten-Daily	0	287.79	89.89	288.46	43.91	288.07	40.6	287.99	11.93	287.7	0	287.51
Monthly												
Min.	0	287.51	0	287.62	18.08	287.15	14.28	287.8	9.92	287.65	0	287.5
Max.	0	288.06	338.57	289.9	69.24	288.31	140.33	288.77	56	288.08	0	287.65
Mean	0	287.72	43.28	288.04	30.98	287.91	39.4	287.98	16.04	287.77	0	287.56

Annual Runoff in MCM : 2274.77 **Annual Runoff in mm : 1315.66**

Peak Observed Discharge = 6050.3 cumecs on 12/7/2016 Corres. Water Level = 298.5 m

Lowest Observed Discharge = 0cumecs on 3/3/2017 Corres. Water Level = 287.61 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge #:Discarded Discharge (values changed as per rating curve)

Note:Missing values ignored while arriving at Annual Runoff

Stage Discharge Sheet for Ganjal at Chhidgaon for the period 2017-18

Day	December		January		February		March		April		May	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	0	287.49	0	287.85	0	287.55	0	287.48	0	287.5	0	287.47
2	0	287.89	0	287.85	0	287.55	0	287.48	0	287.5	0	287.47
3	0	287.49	0	287.86	0	287.55	0	287.48	0	287.49	0	287.47
4	0	287.49	0	287.86	0	287.55	0	287.48	0	287.49	0	287.47
5	0	287.48	0	287.86	0	287.56	0	287.49	0	287.48	0	287.47
6	0	287.48	0	287.86	0	287.56	0	287.5	0	287.48	0	287.47
7	0	287.48	0	287.86	0	287.56	0	287.51	0	287.48	0	287.47
8	0	287.48	0	287.87	0	287.56	0	287.51	0	287.48	0	287.48
9	0	287.48	0	287.87	0	287.55	0	287.51	0	287.48	0	287.48
10	0	287.48	0	287.87	0	287.55	0	287.52	0	287.48	0	287.48
11	0	287.48	0	287.87	0	287.55	0	287.53	0	287.48	0	287.48
12	0	287.48	0	287.86	0	287.55	0	287.54	0	287.48	0	287.48
13	0	287.48	0	287.86	0	287.54	0	287.54	0	287.48	0	287.48
14	0	287.47	0	287.87	0	287.54	0	287.54	0	287.48	0	287.49
15	0	287.47	0	287.87	0	287.53	0	287.54	0	287.48	0	287.49
16	0	287.47	0	287.86	0	287.53	0	287.53	0	287.48	0	287.48
17	0	287.47	0	287.86	0	287.53	0	287.53	0	287.48	0	287.5
18	0	287.47	0	287.86	0	287.53	0	287.54	0	287.47	0	287.49
19	0	287.47	0	287.86	0	287.52	0	287.55	0	287.47	0	287.49
20	0	287.47	0	287.86	0	287.52	0	287.54	0	287.47	0	287.49
21	0	287.46	0	287.86	0	287.51	0	287.53	0	287.47	0	287.49
22	0	287.46	0	287.86	0	287.51	0	287.53	0	287.47	0	287.49
23	0	287.46	0	287.85	0	287.5	0	287.53	0	287.48	0	287.49
24	0	287.46	0	287.85	0	287.5	0	287.52	0	287.48	0	287.48
25	0	287.47	0	287.85	0	287.5	0	287.52	0	287.48	0	287.48
26	0	287.48	0	287.85	0	287.49	0	287.51	0	287.48	0	287.48
27	0	287.49	0	287.85	0	287.49	0	287.51	0	287.48	0	287.48
28	0	287.5	0	287.85	0	287.49	0	287.51	0	287.48	0	287.48
29	0	287.51	0	287.84			0	287.51	0	287.48	0	287.47
30	0	287.52	0	287.84			0	287.51	0	287.48	0	287.47
31	0	287.53	0	287.83			0	287.5				
Ten-Daily Mean												
I Ten-Daily	0	287.52	0	287.86	0	287.55	0	287.5	0	287.49	0	287.47
II Ten-Daily	0	287.47	0	287.86	0	287.53	0	287.54	0	287.48	0	287.49
III Ten-Daily	0	287.49	0	287.85	0	287.5	0	287.52	0	287.48	0	261.35
Monthly												
Min.	0	287.46	0	287.83	0	287.49	0	287.48	0	287.47	0	287.47
Max.	0	287.89	0	287.87	0	287.56	0	287.55	0	287.5	0	287.5
Mean	0	287.49	0	287.86	0	287.53	0	287.52	0	287.48	0	278.77

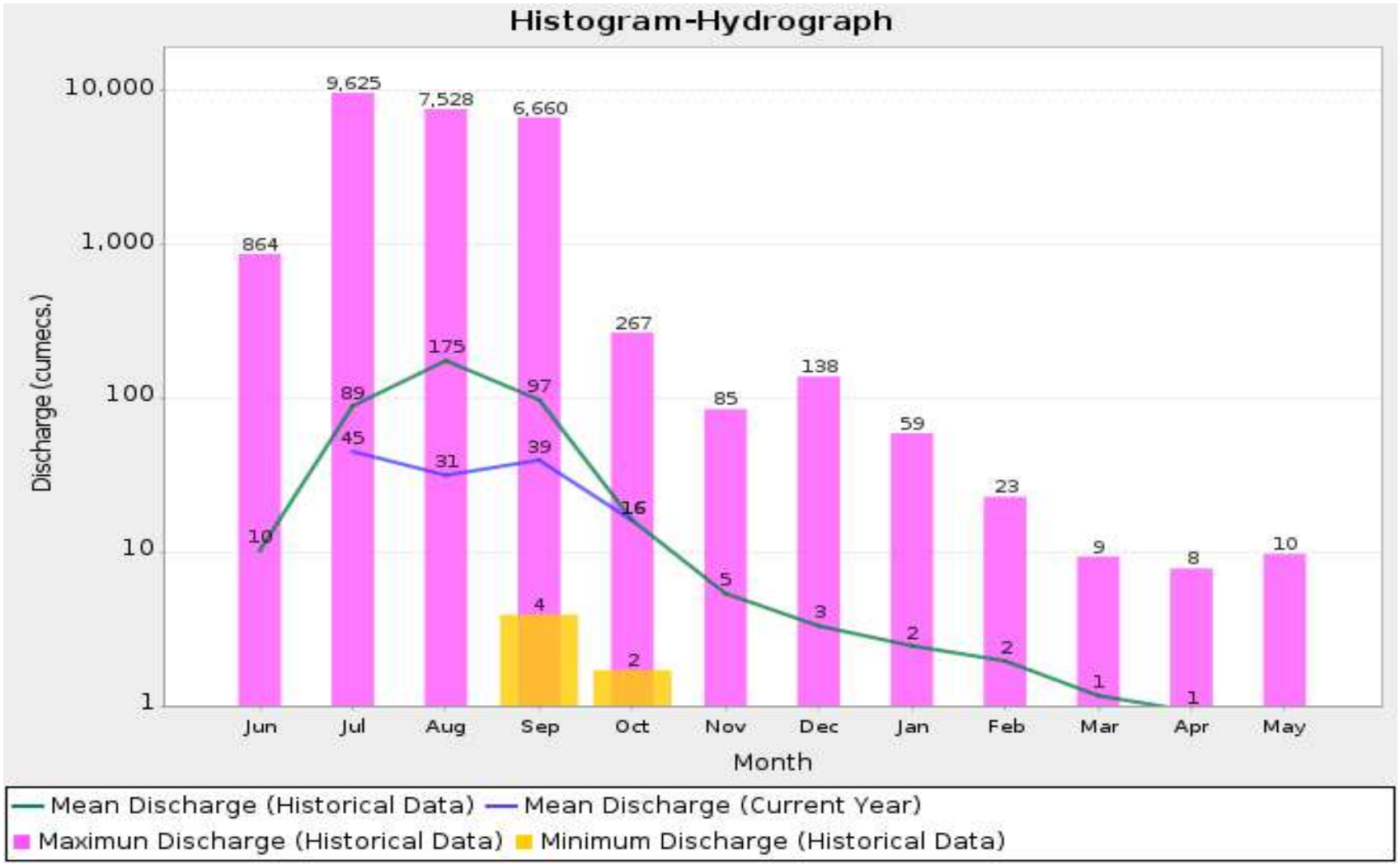
Annual Runoff in mm : 201.73

Peak Computed Discharge = 60 cumecs on 23/7/2017 Corres. Water Level 288.28 m

Lowest Computed Discharge = 0cumecs on 5/7/2017 Corres. Water Level 287.73 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge
#:Discarded Discharge (values changed as per rating curve)
Note:Missing values ignored while arriving at Annual Runoff

Histogram – Hydrograph for Water Year : 2017-18 (Data considered : 1977-2018)



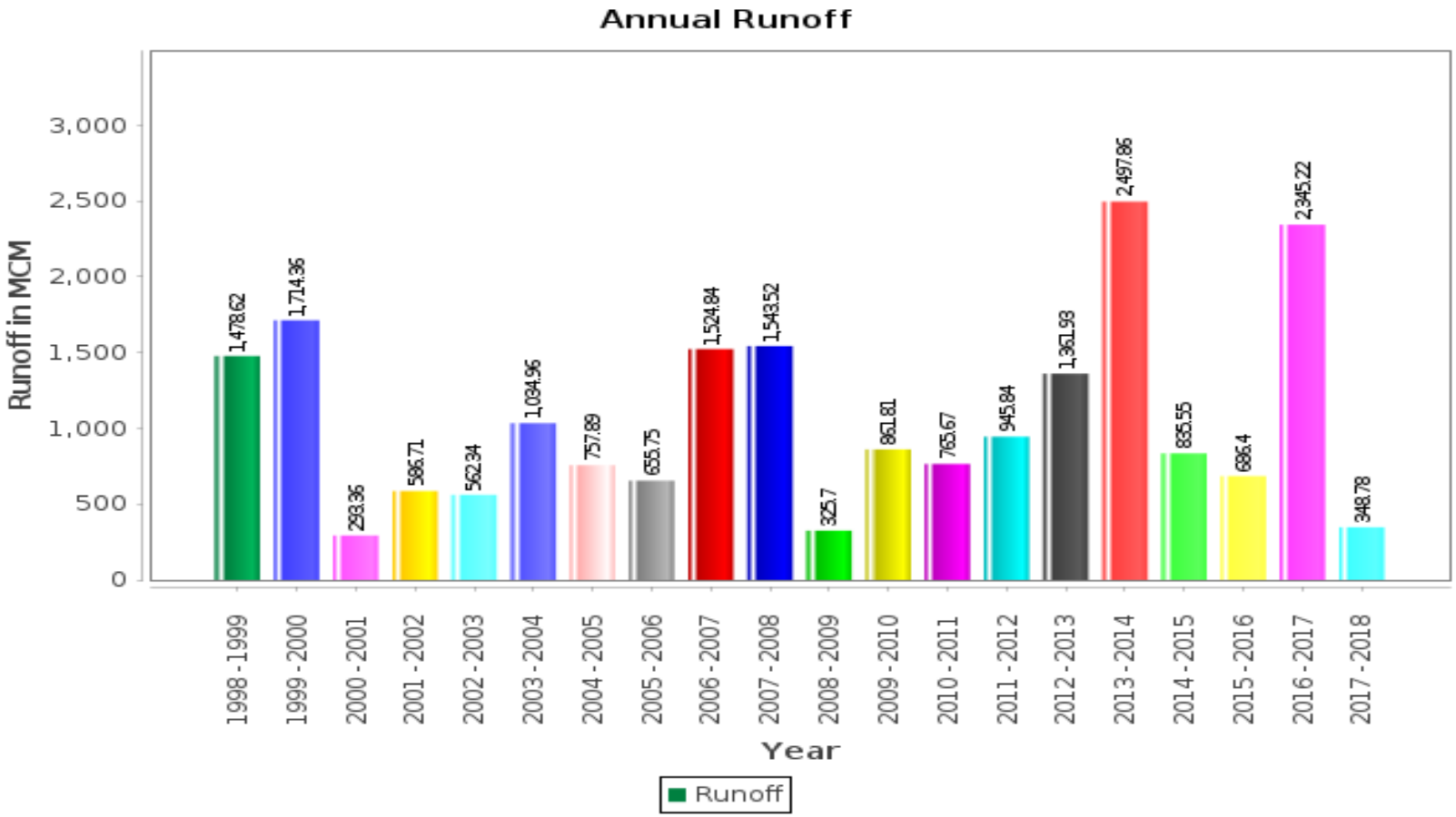
Annual Runoff Values for the period (1979 – 2018)

Station Name : Ganjal at Chhidgaon (010215020)

Division : Narmada Division, Bhopal

Local River : Ganjal

Sub-Division :MNSD II, CWC Bhopal

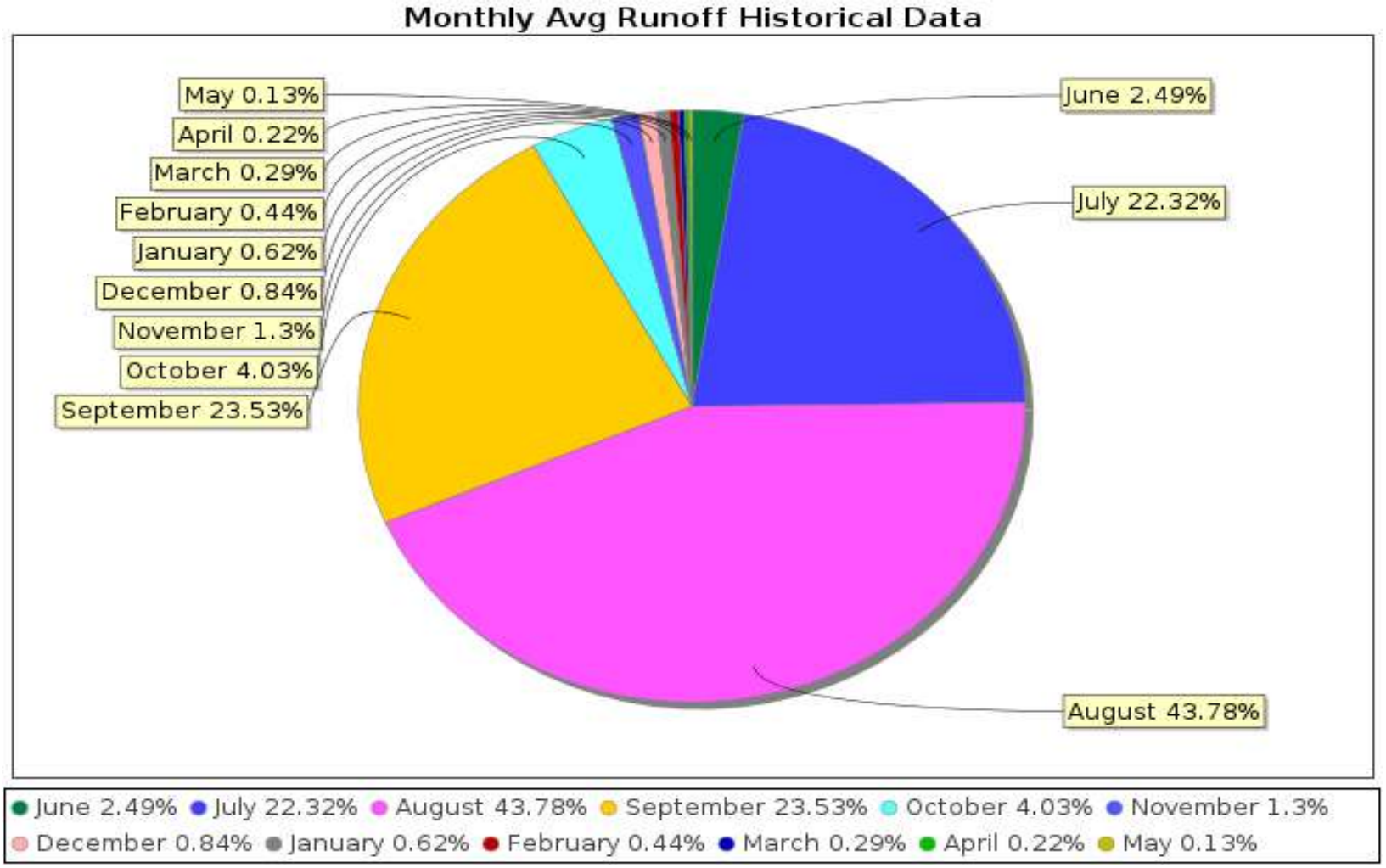


Note: Missing values have not been considered while arriving at Annual Runoff

Monthly Average Runoff based on period (1977 – 2018)

Station Name : Ganjal at Chhidgaon (010215020) Division : Narmada Division, Bhopal

Local River : Ganjal Sub-Division :MNSD II, CWC Bhopal



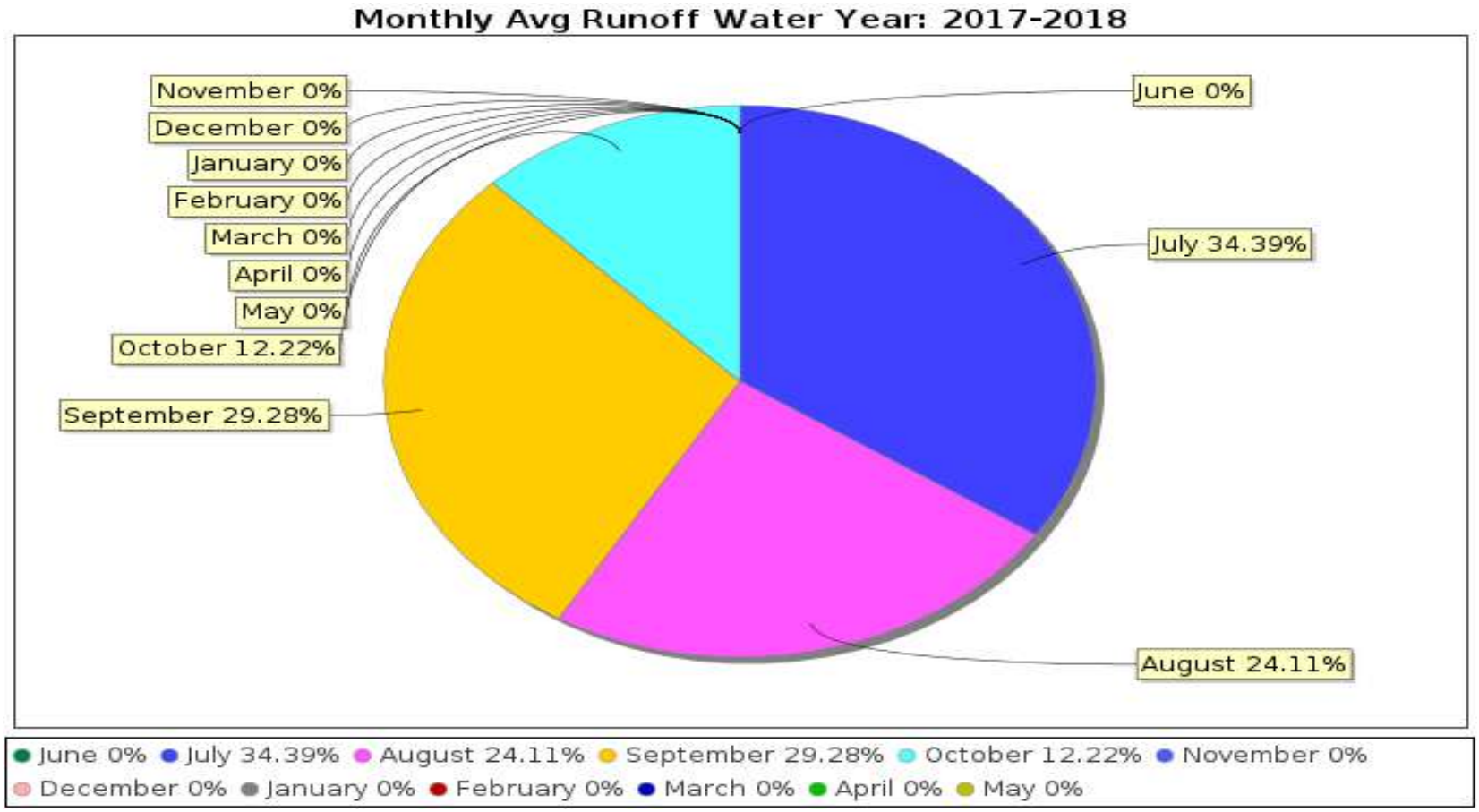
Monthly Runoff for the Year (2017-18)

Station Name : Ganjal at Chhidgaon (010215020)

Division : Narmada Division, Bhopal

Local River : Ganjal

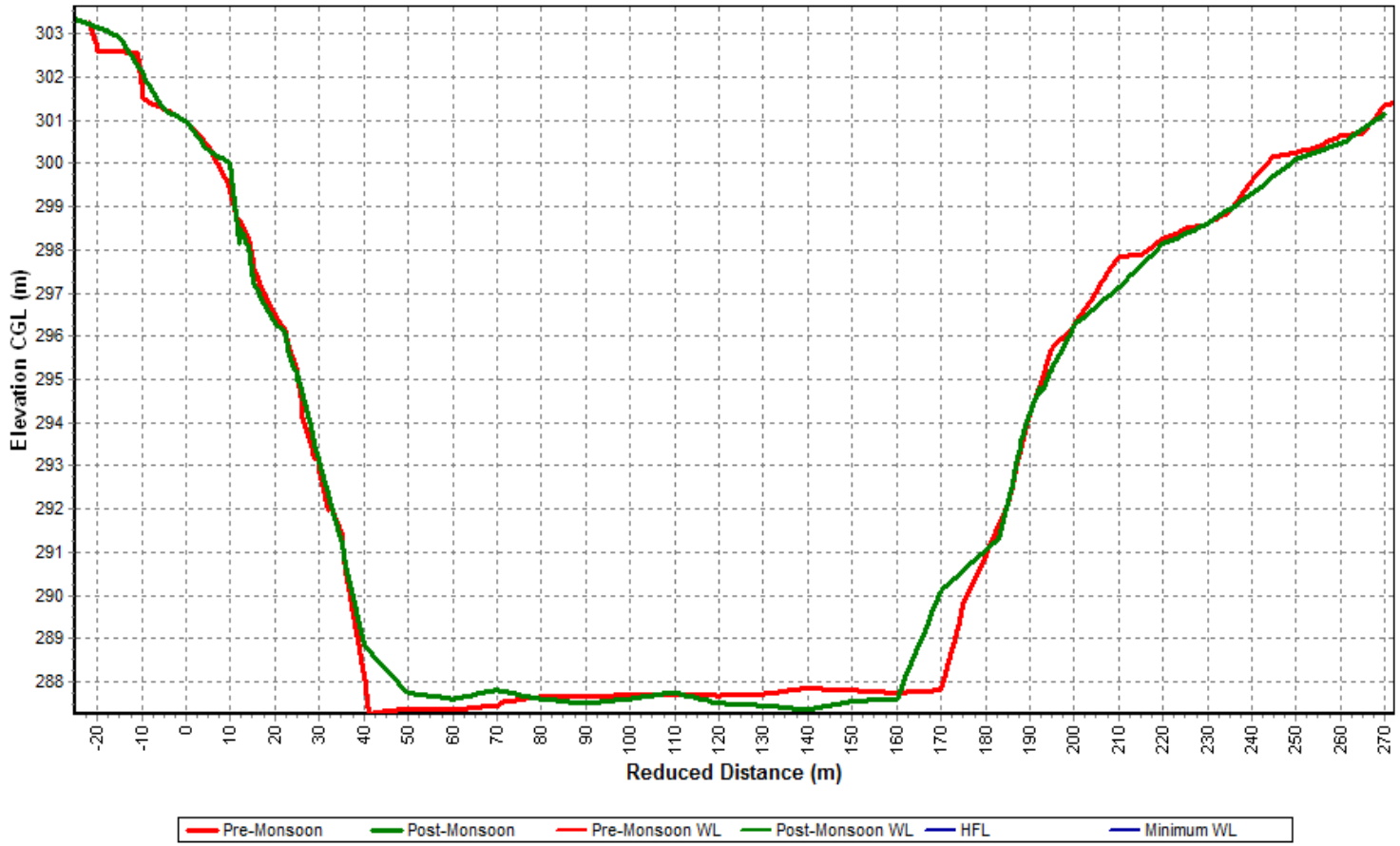
Sub-Division :MNSD II, CWC Bhopal



Pre-Monsoon & Post-Monsoon X-Section for Water Year (2017-18)

Station Name : Ganjal at Chhidgaon (010215020) Division : Narmada Division, Bhopal

Local River : Ganjal Sub-Division :MNSD II, CWC Bhopal



4.7 Narmada at Hoshangabad

History sheet

HISTORY SHEET (DISCHARGE AND WATER LEVEL)

			Water Year	:	2017 - 2018
Site	:	Hoshangabad	**Code**	:	016-NDBHP
State	:	Madhya Pradesh	**District**	:	Hoshangabad
Basin	:	NARMADA	**Independent River**	:	Narmada
Tributary	:	-	**Sub Tributary**	:	-
Sub-Sub Tributary	:	-	**Local River**	:	Narmada
Division	:	Narmada Division(ND), Bhopal	**Sub-Division**	:	Middle Narmada Sub-Division-I, Hosangabad
Drainage Area	:	44548.0 Sq. Km.	**Bank**	:	
Latitude	:	22°45'21''	**Longitude**	:	77°44'3''
Current Zero of Gauge (m)	:	282			

CATEGORY		Opening Date	Closing Date
Gauge	:		
Discharge	:		
Sediment	:		
Water Quality	:		

Reduced Level	Opening Date	Closing Date
282.0	05/01/2017	-
282.0	01/01/2013	24/04/2014
282.0	21/05/1972	25/04/2014
282.0	25/04/2014	05/01/2017

Annual Maximum / Minimum discharge with corresponding Water Level (m.s.l)

	Maximum			Minimum		
Year	Q (cumecs)	WL (m)	Date	Q (cumecs)	WL (m)	Date
1971-1972	0	0	13/01/1972	0	0	13/01/1972
1972-1973	2941.7	288.543	16/09/1972	23.5	284.14	27/05/1973
1973-1974	31600	300.625	30/08/1973	25	284.13	03/06/1973
1974-1975	28435.3	300.805	20/08/1974	22.4	283.805	30/05/1975
1975-1976	13865.2	295.21	25/08/1975	19.4	283.805	11/06/1975
1976-1977	10350	292.995	05/08/1976	15	283.775	26/05/1977
1977-1978	15436.6	296.045	09/08/1977	15.2	283.77	09/06/1977
1978-1979	18400	295.895	26/08/1978	27	283.885	02/06/1978
1979-1980	11200.7	294.345	10/08/1979	14.3	283.775	30/05/1980
1980-1981	21893.4	296.4	30/08/1980	14.9	283.77	03/06/1980
1981-1982	5853.6	290.475	17/08/1981	20	283.9	15/06/1981
1982-1983	16885.7	294.55	23/08/1982	21.4	284.827	26/06/1982
1983-1984	22020	296.2	10/09/1983	26.9	284.145	16/06/1983
1984-1985	28600	298.61	19/08/1984	27.9	283.93	29/05/1985
1985-1986	12470	293.69	10/08/1985	19	283.96	09/06/1985
1986-1987	20680	296.25	24/07/1986	20.1	283.95	30/05/1987
1987-1988	15945	294.66	18/09/1987	15	283.9	29/05/1988
1988-1989	16800	295.09	05/08/1988	15.07	283.895	03/06/1988
1989-1990	10800	292.53	08/08/1989	18.87	283.925	03/06/1989
1990-1991	12810	293.5	23/08/1990	12.8	284.715	03/02/1991
1991-1992	20000	296.4	25/08/1991	58	284.26	11/05/1992
1992-1993	9750	292.01	13/09/1992	56.58	284.22	12/07/1992
1993-1994	12100	293.37	06/08/1993	49	284.48	10/06/1993
1994-1995	20200	296.16	22/07/1994	100.4	284.415	21/01/1995
1995-1996	10100	292.23	12/08/1995	102.6	284.48	02/06/1995
1996-1997	3450	288.5	27/07/1996	87.39	284.19	22/06/1996
1997-1998	11860	292.05	26/07/1997	67.84	284.19	11/06/1997
1998-1999	18000	295.14	15/09/1998	49	284.21	30/05/1999
1999-2000	27800	299.53	19/09/1999	42	284.2	06/06/1999
2000-2001	5600	290.32	29/07/2000	70	284.24	11/04/2001
2001-2002	6280	290.19	16/07/2001	67.81	284.25	04/06/2001
2002-2003	14560	294.2	19/08/2002	85.42	284.41	30/05/2003
2003-2004	12539	292.7	28/07/2003	72.78	284.36	19/05/2004
2004-2005	12500	293.31	23/08/2004	64.7	284.29	07/06/2004
2005-2006	14279.56	294	06/07/2005	18.5	284.19	12/06/2005
2006-2007	14924	294.69	01/09/2006	62.42	284.19	25/06/2006
2007-2008	9373.05	291.8	09/07/2007	9.55	284	08/07/2007

2008-2009	6239.87	289.99	02/08/2008	76.04	284.31	23/01/2009
2009-2010	20983.97	296.89	10/09/2009	48.93	284.21	04/07/2009
2010-2011	4784.35	289.5	05/09/2010	65.88	284.33	06/12/2010
2011-2012	9075.81	291.5	24/07/2011	0	284.26	12/06/2011
2012-2013	16972.88	295.55	07/08/2012	38.96	284.13	07/06/2012
2013-2014	23529.48	299.18	23/08/2013	91.14	284.25	16/05/2014
2014-2015	4751.59	289.1	09/08/2014	83.77	284.3	29/06/2014
2015-2016	2796.64	287.99	14/08/2015	86.01	284.32	20/11/2015
2016-2017	8000	291.7	09/07/2016	10.9	291	10/07/2016
2017-2018	1450	286.65	22/07/2017	26	284.37	18/02/2018

Stage Discharge Sheet for Narmada at Hoshangabad for the period 2017-18

Day	June		July		August		September		October		November	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	119.2	284.44	395.7	285.02	436.1	285.16	502.7	285.35	119.2	284.44	395.7	285.02
2	109.3	284.42	397.1	285.03	405.2	285.06	452	285.21	109.3	284.42	397.1	285.03
3	118	284.45	449.4	285.2	381.3	284.96	418	285.1	118	284.45	449.4	285.2
4	103	284.4	451.4	285.2	363.1	284.9	412.7	285	103	284.4	451.4	285.2
5	129.1	284.5	432.5	285.13	263.2	284.81	416.4	285.01	129.1	284.5	432.5	285.13
6	129.8	284.5	380.7	285	257	284.79	277	284.85	129.8	284.5	380.7	285
7	144.4	284.55	377.1	285.95	225.4	284.7	254.6	284.78	144.4	284.55	377.1	285.95
8	148.1	284.57	371.1	284.94	210.3	284.66	245.6	284.73	148.1	284.57	371.1	284.94
9	135.7	284.52	370	284.89	211.5	284.66	221.7	284.69	135.7	284.52	370	284.89
10	123.2	284.45	280.8	284.86	368.7	284.92	218	284.68	123.2	284.45	280.8	284.86
11	120	284.47	270	284.84	419.5	566.1	251.2	284.75	120	284.47	270	284.84
12	118	284.45	268	284.83	381.5	284.96	325.8	285.05	118	284.45	268	284.83
13	109.3	284.42	263.7	284.82	368	284.92	321.2	285.05	109.3	284.42	263.7	284.82
14	115.2	284.44	291.3	284.9	260	284.81	381.5	285.23	115.2	284.44	291.3	284.9
15	123.2	284.48	286	284.89	239	284.73	437.3	285.35	123.2	284.48	286	284.89
16	120.8	284.47	285.2	284.88	207	284.65	404.5	285.28	120.8	284.47	285.2	284.88
17	126.4	284.49	291	284.9	175.5	284.6	465	285.15	126.4	284.49	291	284.9
18	131	284.51	378.9	284.95	153.8	284.55	306.7	284.98	131	284.51	378.9	284.95
19	131.1	284.51	398.5	285.03	182	284.62	315.7	285.03	131.1	284.51	398.5	285.03
20	135.7	284.52	809.8	285.87	388	284.98	389.6	285.25	135.7	284.52	809.8	285.87
21	129.1	284.5	1244	286.23	389.1	284.98	484.6	285.47	129.1	284.5	1244	286.23
22	148.1	284.57	1450	286.65	390	284.98	514.2	285.52	148.1	284.57	1450	286.65
23	155.7	284.6	1330	286.55	274.7	284.85	1304	286.28	155.7	284.6	1330	286.55
24	158	284.61	1244	286.23	249.9	284.74	540	285.55	158	284.61	1244	286.23
25	178	284.57	810	285.85	218	284.68	540	285.55	178	284.57	810	285.85
26	143	284.55	600	285.6	215.8	284.67	412	285.38	143	284.55	600	285.6
27	153.2	284.58	495	285.45	246	284.73	346	285.22	153.2	284.58	495	285.45
28	245.2	284.74	455	285.41	425.9	285.13	362	285.13	245.2	284.74	455	285.41
29	400.1	284.04	1325	286.5	744	285.85	316	285.04	400.1	284.04	1325	286.5
30	38.28	284.95	650	285.59	660	285.6	308	285	38.28	284.95	650	285.59
31			495.2	285.29	678	285.66					495.2	285.29
Ten-Daily Mean												
I Ten-Daily	125.98	284.48	390.58	285.12	312.18	284.86	341.87	284.94	125.98	284.48	390.58	285.12
II Ten-Daily	123.07	284.48	354.24	284.99	277.43	312.89	359.85	285.11	123.07	284.48	354.24	284.99
III Ten-Daily	174.87	284.57	918.02	285.94	408.31	285.08	512.68	285.41	174.87	284.57	918.02	285.94
Monthly												
Min.	38.28	284.04	263.7	284.82	153.8	284.55	218	284.68	38.28	284.04	263.7	284.82
Max.	400.1	284.95	1450	286.65	744	566.1	1304	286.28	400.1	284.95	1450	286.65
Mean	119.2	284.44	395.7	285.02	436.1	285.16	502.7	285.35	141.31	284.51	554.28	285.35

Annual Runoff in MCM : 5797.33

Peak Observed Discharge = 1244 cumecs on 21/7/2017 Corres. Water Level 286.23 m

Lowest Observed Discharge = 32.3cumecs on 25/4/2018 Corres. Water Level 284.25 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge #:Discarded Discharge (values changed as per rating curve)

Note:Missing values ignored while arriving at Annual Runoff

Stage Discharge Sheet for Narmada at Hoshangabad for the period 2017-18

Day	December		January		February		March		April		May	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	436.1	285.16	502.7	285.35	119.2	284.44	395.7	285.02	436.1	285.16	502.7	285.35
2	405.2	285.06	452	285.21	109.3	284.42	397.1	285.03	405.2	285.06	452	285.21
3	381.3	284.96	418	285.1	118	284.45	449.4	285.2	381.3	284.96	418	285.1
4	363.1	284.9	412.7	285	103	284.4	451.4	285.2	363.1	284.9	412.7	285
5	263.2	284.81	416.4	285.01	129.1	284.5	432.5	285.13	263.2	284.81	416.4	285.01
6	257	284.79	277	284.85	129.8	284.5	380.7	285	257	284.79	277	284.85
7	225.4	284.7	254.6	284.78	144.4	284.55	377.1	285.95	225.4	284.7	254.6	284.78
8	210.3	284.66	245.6	284.73	148.1	284.57	371.1	284.94	210.3	284.66	245.6	284.73
9	211.5	284.66	221.7	284.69	135.7	284.52	370	284.89	211.5	284.66	221.7	284.69
10	368.7	284.92	218	284.68	123.2	284.45	280.8	284.86	368.7	284.92	218	284.68
11	419.5	566.1	251.2	284.75	120	284.47	270	284.84	419.5	566.1	251.2	284.75
12	381.5	284.96	325.8	285.05	118	284.45	268	284.83	381.5	284.96	325.8	285.05
13	368	284.92	321.2	285.05	109.3	284.42	263.7	284.82	368	284.92	321.2	285.05
14	260	284.81	381.5	285.23	115.2	284.44	291.3	284.9	260	284.81	381.5	285.23
15	239	284.73	437.3	285.35	123.2	284.48	286	284.89	239	284.73	437.3	285.35
16	207	284.65	404.5	285.28	120.8	284.47	285.2	284.88	207	284.65	404.5	285.28
17	175.5	284.6	465	285.15	126.4	284.49	291	284.9	175.5	284.6	465	285.15
18	153.8	284.55	306.7	284.98	131	284.51	378.9	284.95	153.8	284.55	306.7	284.98
19	182	284.62	315.7	285.03	131.1	284.51	398.5	285.03	182	284.62	315.7	285.03
20	388	284.98	389.6	285.25	135.7	284.52	809.8	285.87	388	284.98	389.6	285.25
21	389.1	284.98	484.6	285.47	129.1	284.5	1244	286.23	389.1	284.98	484.6	285.47
22	390	284.98	514.2	285.52	148.1	284.57	1450	286.65	390	284.98	514.2	285.52
23	274.7	284.85	1304	286.28	155.7	284.6	1330	286.55	274.7	284.85	1304	286.28
24	249.9	284.74	540	285.55	158	284.61	1244	286.23	249.9	284.74	540	285.55
25	218	284.68	540	285.55	178	284.57	810	285.85	218	284.68	540	285.55
26	215.8	284.67	412	285.38	143	284.55	600	285.6	215.8	284.67	412	285.38
27	246	284.73	346	285.22	153.2	284.58	495	285.45	246	284.73	346	285.22
28	425.9	285.13	362	285.13	245.2	284.74	455	285.41	425.9	285.13	362	285.13
29	744	285.85	316	285.04	400.1	284.04	1325	286.5	744	285.85	316	285.04
30	660	285.6	308	285	38.28	284.95	650	285.59	660	285.6	308	285
31	678	285.66					495.2	285.29	678	285.66		
Ten-Daily Mean												
I Ten-Daily	312.18	284.86	341.87	284.94	125.98	284.48	390.58	285.12	312.18	284.86	341.87	284.94
II Ten-Daily	277.43	312.89	359.85	285.11	123.07	284.48	354.24	284.99	277.43	312.89	359.85	285.11
III Ten-Daily	408.31	285.08	512.68	285.41	174.87	284.57	918.02	285.94	408.31	285.08	512.68	285.41
Monthly												
Min.	153.8	284.55	218	284.68	38.28	284.04	263.7	284.82	153.8	284.55	218	284.68
Max.	744	566.1	1304	286.28	400.1	284.95	1450	286.65	744	566.1	1304	286.28
Mean	332.64	294.28	404.8	285.16	141.31	284.51	554.28	285.35	332.64	294.28	404.8	285.16

Annual Runoff in mm : 130.14

Peak Computed Discharge = 1450 cumecs on 22/7/2017 Corres. Water Level 286.65 m

Lowest Computed Discharge = 26cumecs on 18/2/2018 Corres. Water Level 284.37 m

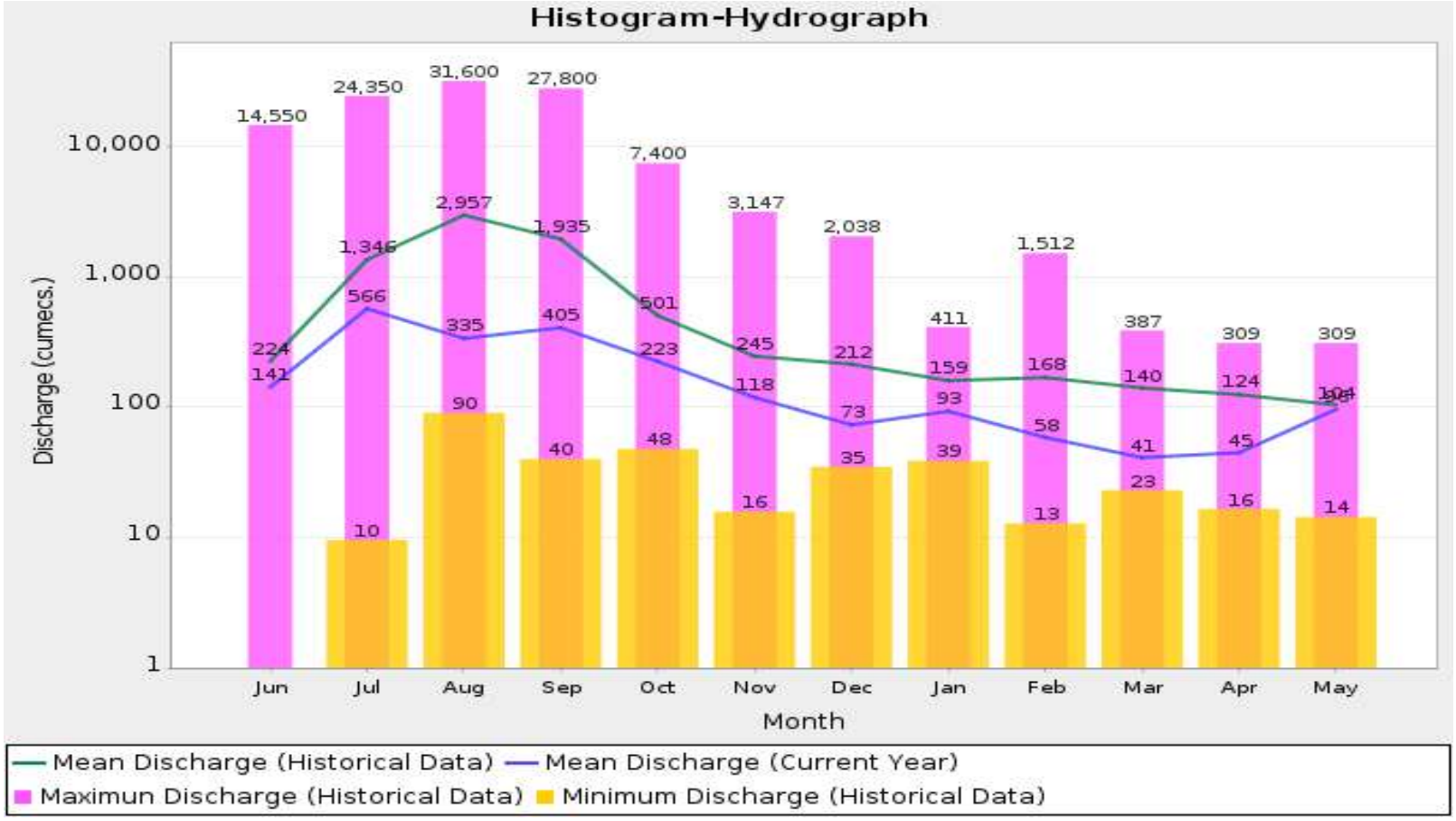
Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge #:Discarded Discharge (values changed as per rating curve)

Note:Missing values ignored while arriving at Annual Runoff

Histogram- Hydrograph for Water Year : 2017-18 (Data considered : 1973-2018)

Station Name : Narmada at Hoshangabad (010215019) Division : Narmada Division, Bhopal

Local River : Narmada Sub-Division : MNSD I, CWC Hoshangabad



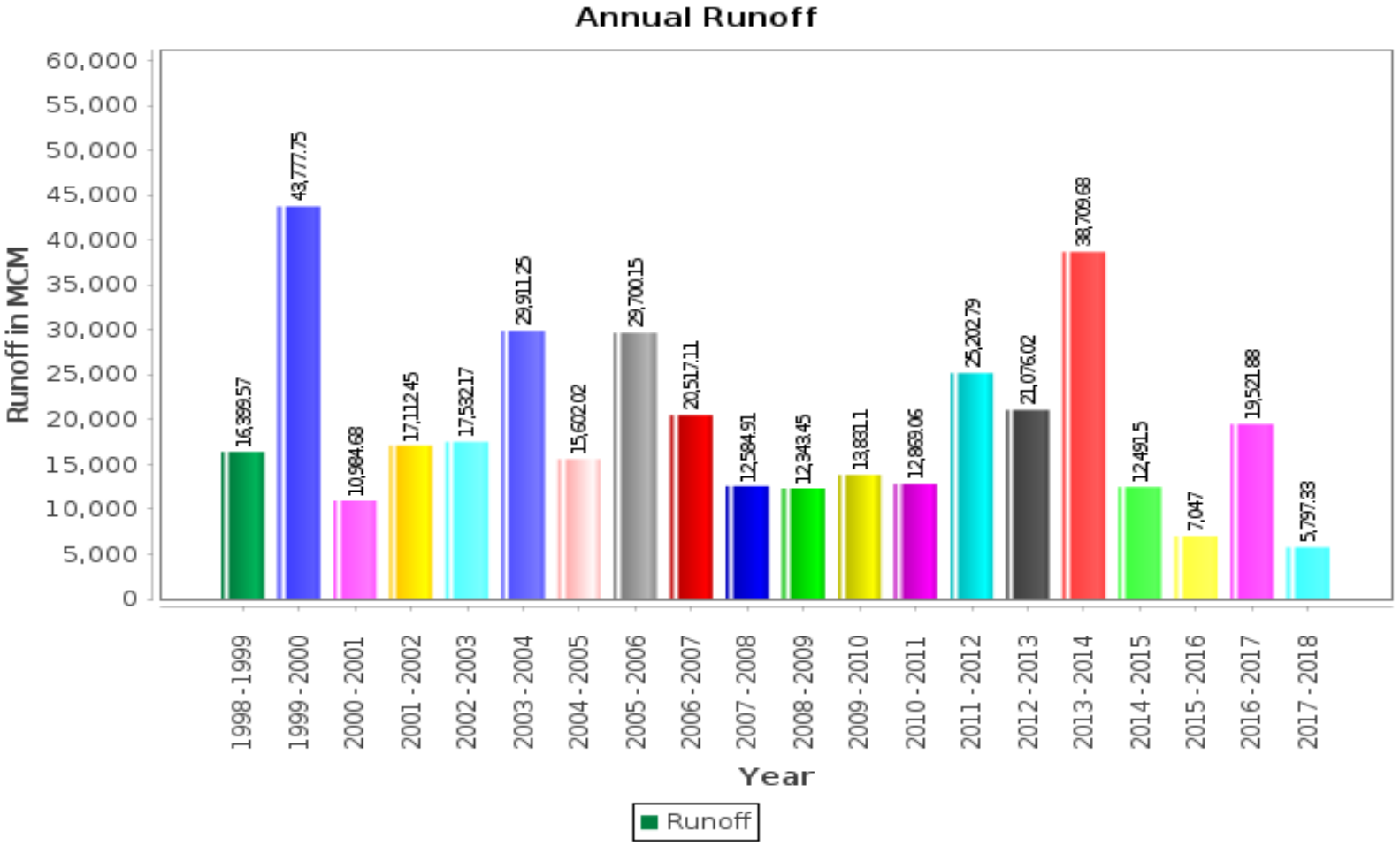
Annual Runoff Values for the period (1973 – 2018)

Station Name : Narmada at Hoshangabad (010215019)

Division : Narmada Division, Bhopal

Local River : Narmada

Sub-Division : MNSD I, CWC Hoshangabad



Note: Missing values have not been considered while arriving at Annual Runoff

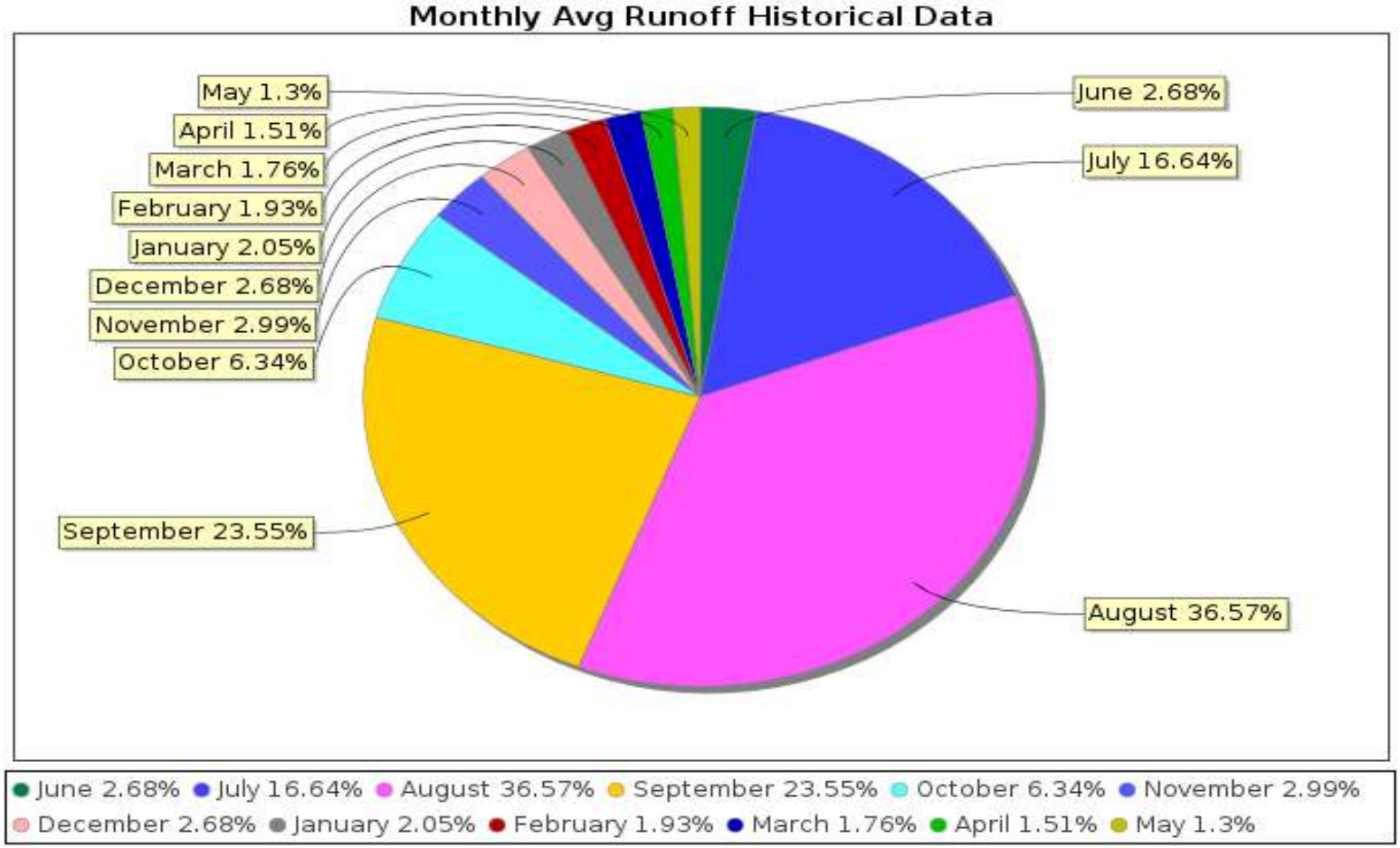
Monthly Average Runoff based on period (1973-2018)

Station Name : Narmada at Hoshangabad (010215019)

Division : Narmada Division, Bhopal

Local River : Narmada

Sub-Division : MNSD I, CWC Hoshangabad



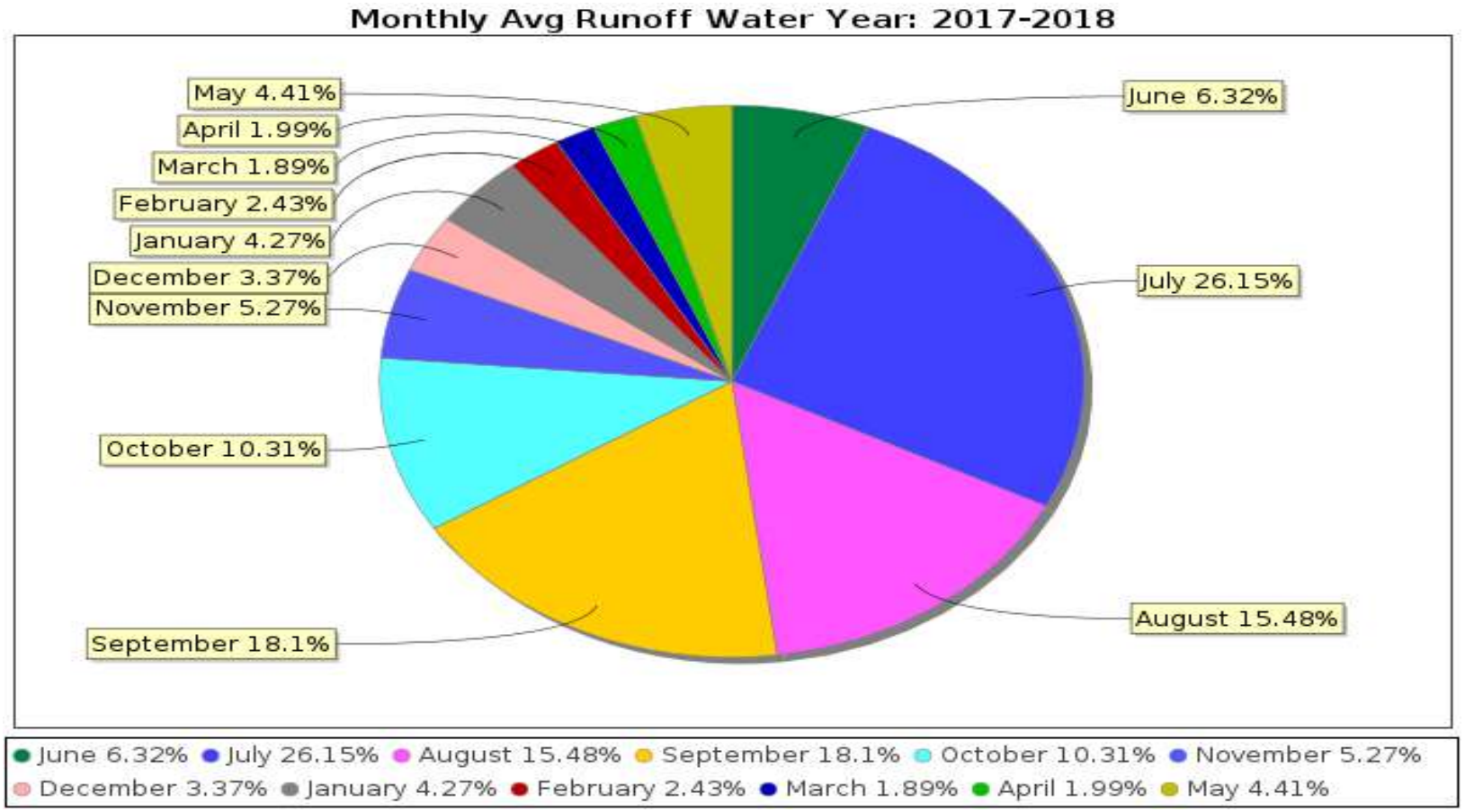
Monthly Runoff for the Year (2017-18)

Station Name : Narmada at Hoshangabad (010215019)

Division : Narmada Division, Bhopal

Local River : Narmada

Sub-Division : MNSD I, CWC Hoshangabad



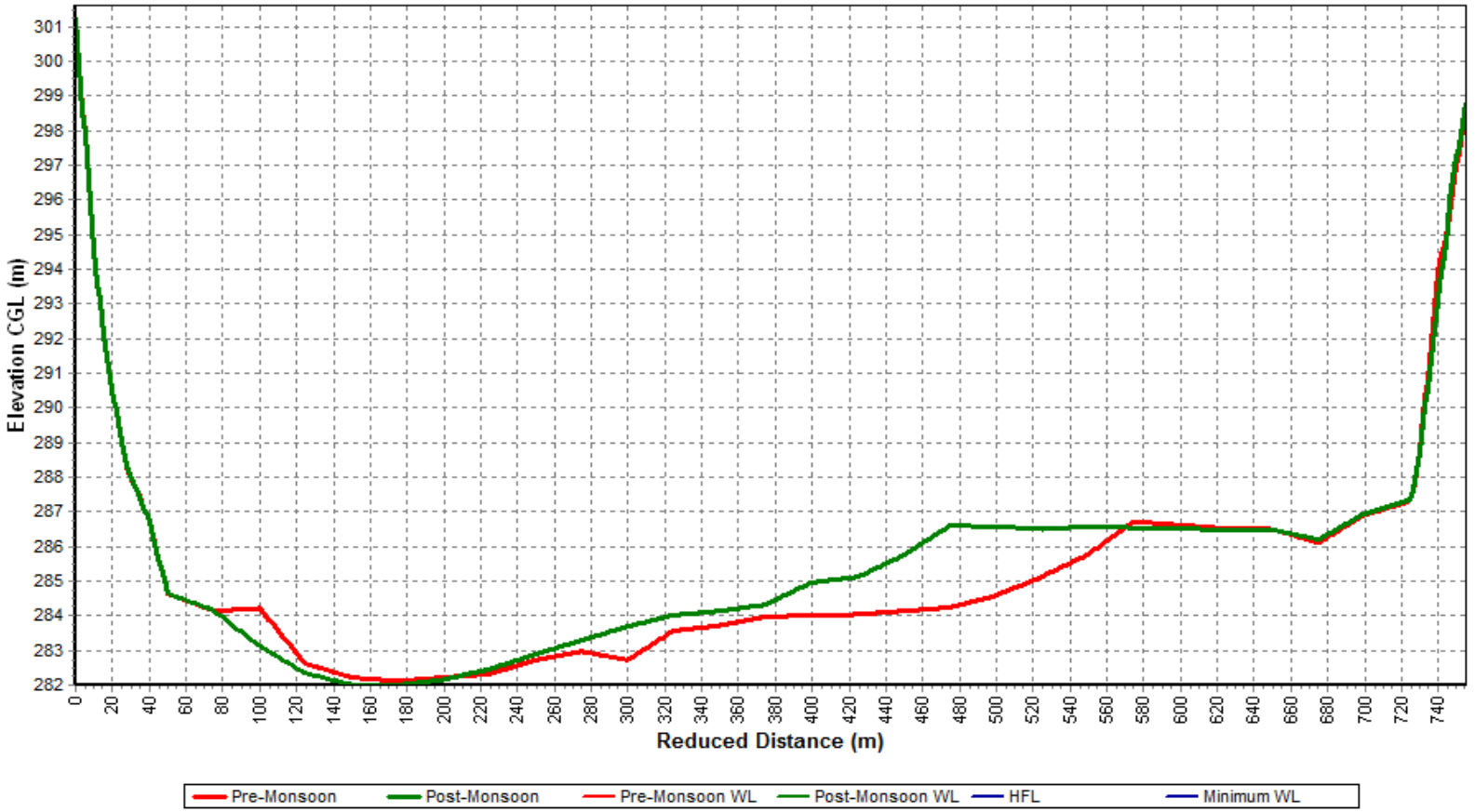
Pre-Monsoon & Post-Monsoon X-Section for Water Year (2017-18)

Station Name : Narmada at Hoshangabad (010215019)

Division : Narmada Division, Bhopal

Local River : Narmada

Sub-Division : MNSD I, CWC Hoshangabad



4.8 Narmada at Sandia

History sheet

HISTORY SHEET (DISCHARGE AND WATER LEVEL)

			Water Year	:	2017 - 2018
Site	:	Sandia	**Code**	:	013 NDBHP
State	:	Madhya Pradesh	**District**	:	Hoshangabad
Basin	:	NARMADA	**Independent River**	:	Narmada
Tributary	:	-	**Sub Tributary**	:	-
Sub-Sub Tributary	:	-	**Local River**	:	Narmada
Division	:	Narmada Division(ND), Bhopal	**Sub-Division**	:	Middle Narmada Sub-Division-I, Hosangabad
Drainage Area	:	33953.5 Sq. Km.	**Bank**	:	Left
Latitude	:	22°54'56''	**Longitude**	:	78°20'50''
Current Zero of Gauge (m)	:	297			

CATEGORY		Opening Date	Closing Date
Gauge	:	01/03/1978	
Discharge	:	18/04/1978	
Sediment	:	09/08/1978	
Water Quality	:		

Reduced Level	Opening Date	Closing Date
297.0	01/03/1978	03/06/2014
297.0	03/06/2014	-

Annual Maximum / Minimum discharge with corresponding Water Level (m.s.l)

	Maximum			Minimum		
Year	Q (cumecs)	WL (m)	Date	Q (cumecs)	WL (m)	Date
1977-1978	38.9	299.665	26/04/1978	0	299.845	01/04/1978
1978-1979	8760	311.27	16/08/1978	0	300.715	31/10/1978
1979-1980	5643.9	307.25	11/08/1979	8.7	299.41	19/05/1980
1980-1981	16400	314.9	30/08/1980	10.6	299.42	04/06/1980
1981-1982	3850	306.12	16/08/1981	3	299.5	06/03/1982
1982-1983	6561	308.18	20/08/1982	4.5	299.28	08/07/1982
1983-1984	14500	314.25	09/09/1983	14	299.34	27/05/1984
1984-1985	16500	314.73	19/08/1984	12.6	299.2	03/05/1985
1985-1986	7600	310.85	09/08/1985	15.5	299.25	06/06/1985
1986-1987	5350	310.19	23/07/1986	16.3	299.075	25/05/1987
1987-1988	12466	311.567	17/09/1987	11.54	298.985	31/05/1988
1988-1989	12600	311.575	05/08/1988	9.29	298.965	09/05/1989
1989-1990	6600	307.725	07/08/1989	11	298.94	04/06/1989
1990-1991	7300	308.53	22/09/1990	21.4	299.48	15/06/1990
1991-1992	19700	314.14	25/08/1991	58.89	299.22	08/05/1992
1992-1993	9600	310.06	13/09/1992	44.91	299.21	10/07/1992
1993-1994	7300	308.5	16/07/1993	32.13	299.14	08/06/1993
1994-1995	17275	314	22/07/1994	87.67	299.57	09/06/1994
1995-1996	10040	310.03	11/08/1995	36	298.9	19/05/1996
1996-1997	2210	303.93	27/07/1996	37.94	299.1	08/04/1997
1997-1998	6900	308.6	25/07/1997	33.68	299.09	11/06/1997
1998-1999	4550	305.62	16/09/1998	28.01	299.21	31/05/1999
1999-2000	24500	316.89	19/09/1999	21.5	299.11	06/06/1999
2000-2001	5390	307.4	29/07/2000	38	299.33	21/01/2001
2001-2002	5360	307.66	15/07/2001	52.27	299.57	01/06/2001
2002-2003	11120	311.42	19/08/2002	45	299.3	18/04/2003
2003-2004	9440	309.67	15/09/2003	55	299.35	08/06/2003
2004-2005	10600	311	23/08/2004	71.02	299.4	16/05/2005
2005-2006	10854.85	311.02	06/07/2005	22.57	299.25	23/06/2005
2006-2007	8846.9	309.98	14/08/2006	14.14	299.28	25/06/2006
2007-2008	4110.91	306.1	08/07/2007	34.29	299.52	07/04/2008
2008-2009	5499.45	307.57	02/08/2008	51.46	299.66	21/01/2009
2009-2010	25288.18	314.1	10/09/2009	47.75	299.38	04/04/2010
2010-2011	2142.24	304.21	21/09/2010	67.92	299.24	04/05/2011
2011-2012	8982.61	309.82	09/09/2011	33.35	299.11	28/05/2012
2012-2013	7421.63	308.425	07/08/2012	29.29	299.11	09/06/2012
2013-2014	16259.29	314.05	23/08/2013	65.45	299.3	15/05/2014

2014-2015	4602.13	306.91	08/08/2014	75.02	299.325	18/06/2014
2015-2016	2982.3	305.32	05/08/2015	40.26	299.25	03/03/2016
2016-2017	6517.6	307.58	09/08/2016	57	299.29	12/06/2016
2017-2018	1625.4	303	21/07/2017	0	299.04	04/03/2018

Stage Discharge Sheet for Narmada at Sandia for the period 2017-18

Day	June		July		August		September		October		November	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	77.5	299.28	185.3	299.89	226	300.05	307.4	300.35	160	299.86	96	299.55
2	73.7	299.25	275	300.32	184.3	299.9	260	300.29	150	299.77	93	299.51
3	74.4	299.22	277.2	300.31	127.4	299.79	250	300.26	146.7	299.72	90	299.5
4	95	299.42	251.2	300.15	116.7	299.74	206.6	300.11	136.3	299.65	96	299.55
5	83.3	299.28	215.7	300.01	91.6	299.6	189.1	300	134.2	299.62	90	299.5
6	97.8	299.41	197.2	299.92	257	299.53	160.8	299.85	132.9	299.59	90	299.5
7	102.6	299.43	181.2	299.86	74.9	299.52	146.4	299.75	132.2	299.58	80	299.45
8	97.5	299.41	163.1	299.75	72.2	299.5	142.5	299.73	100	299.64	80	299.45
9	81.6	299.22	152	299.7	192.7	299.98	142.5	299.73	98.6	299.57	75	299.38
10	78.1	299.27	153.4	299.71	301.7	300.35	147	299.77	97.3	299.56	70	299.35
11	76	299.26	152.8	299.71	180.3	299.94	243.6	300.27	95.8	299.55	96	299.55
12	81.6	299.29	152	299.7	176.2	299.92	205.8	300.12	99.9	299.58	105	299.57
13	88	299.32	147.4	299.68	158	299.73	347.1	300.61	116.8	299.68	95	299.51
14	92.6	299.35	148.83	299.68	260	299.63	410	300.78	108.9	299.63	75	299.38
15	88.7	299.32	163.5	299.75	80	299.56	342	300.53	105	299.6	60	299.26
16	97.1	299.36	172	299.79	70.5	299.49	315	300.43	115.9	299.67	60	299.25
17	97.2	299.36	185.9	299.85	63.8	299.41	220	300.18	117.1	299.69	60	299.25
18	99	299.38	206.2	299.95	59.3	299.36	208.8	300.13	104.6	299.61	60	299.25
19	102.9	299.4	176.3	299.79	97.7	299.59	332.8	300.23	95	299.54	60	299.25
20	95.4	299.36	559	300.88	176	299.92	450	300.81	101.4	299.58	60	299.25
21	101.4	299.39	1625.4	303	178.1	299.98	336.1	300.5	104.2	299.61	55	299.23
22	108.7	299.44	1095.8	302.3	390	299.78	750	301.5	98.6	299.57	50	299.2
23	104.3	299.41	1120	302.32	103.1	299.64	770	301.58	101.5	299.58	45	299.15
24	96.2	299.36	706.9	301.36	90.5	299.57	560	300.95	103.6	299.62	40	299.1
25	90	299.33	589.2	300.97	81.3	299.52	462	300.85	101	299.58	40	299.1
26	94	299.35	531.73	300.73	81.3	299.52	338.9	300.48	97.6	299.55	42	299.13
27	159	299.76	430.1	300.49	246	300.36	313.5	300.32	94.1	299.53	45	299.15
28	169	299.81	411	300.43	342.7	300.6	199.8	300.08	104	299.58	45	299.15
29	163	299.79	437.5	300.52	324.4	300.5	197.1	300.05	110	299.64	40	299.1
30	174.2	299.84	269	300.33	589	301	180.4	300	107.1	299.6	40	299.1
31			276.5	300.22	372	300.7			97.7	299.56		
Ten-Daily Mean												
I Ten-Daily	86.15	299.32	205.13	299.96	164.45	299.8	195.23	299.98	128.82	299.66	86	299.47
II Ten-Daily	91.85	299.34	206.39	299.88	132.18	299.66	307.51	300.41	106.04	299.61	73.1	299.35
III Ten-Daily	125.98	299.55	681.19	301.15	254.4	300.11	410.78	300.63	101.76	299.58	44.2	299.14
Monthly												
Min.	73.7	299.22	147.4	299.68	59.3	299.36	142.5	299.73	94.1	299.53	40	299.1
Max.	174.2	299.84	1625.4	303	589	301	770	301.58	160	299.86	105	299.57
Mean	101.33	299.4	364.24	300.33	183.68	299.85	304.51	300.34	112.21	299.62	67.77	299.32

Annual Runoff in MCM : 3464.78

Peak Observed Discharge = 1625.4 cumecs on 21/7/2017 Corres. Water Level 303 m

Lowest Observed Discharge = 0cumecs on 4/3/2018 Corres. Water Level 299.04 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge #:Discarded Discharge (values changed as per rating curve)

Note:Missing values ignored while arriving at Annual Runoff

Stage Discharge Sheet for Narmada at Sandia for the period 2017-18

Day	December		January		February		March		April		May	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	45	299.15	43	299.14	74	299.4	0	299.04	0	299.15	0	299.49
2	60	299.15	43	299.14	68	299.3	0	299.04	0	299.07	0	299.41
3	65	299.27	44	299.14	52	299.18	0	299.04	0	299	0	299.83
4	65	299.27	45	299.15	42	299.12	0	299.04	0	298.96	0	299.4
5	60	299.25	50	299.2	41	299.12	0	299.04	0	298.96	0	299.44
6	50	299.18	67	299.25	37	299.07	0	299.04	0	299.39	0	299.43
7	40	299.1	46	299.16	36	299.05	0	299.04	0	299.44	0	299.48
8	40	299.1	72	299.32	35	299.01	0	299.04	0	299.2	0	299.51
9	40	299.1	75	299.35	34	299	0	299.04	0	299.11	0	299.53
10	38	299.06	76	299.36	35	299	0	299.02	0	299.04	0	299.56
11	38	299.05	64	299.35	34	299	0	299	0	299	0	299.55
12	38	299.05	55.8	299.22	39	299.05	0	299	0	298.98	0	299.53
13	39	299.05	56	299.22	40	299.08	0	299	0	298.98	0	299.56
14	137	299.65	77	299.4	42	299.09	0	298.99	0	298.97	0	299.56
15	98	299.55	85	299.47	44	299.12	0	298.98	0	298.96	0	299.52
16	70	299.32	87	299.48	46	299.15	0	298.98	0	299.01	0	299.53
17	65	299.25	85	299.47	45	299.15	0	298.97	0	299.02	0	299.54
18	65	299.25	84	299.46	41	299.09	0	298.97	0	298.97	0	299.57
19	60	299.26	85	299.46	46	299.15	0	298.97	0	298.95	0	299.52
20	50	299.2	86	299.46	47	299.16	0	298.97	0	298.92	0	299.54
21	45	299.15	82	299.45	44.8	299.11	0	299.02	0	298.91	0	299.55
22	45	299.15	81	299.45	42	299.09	0	299.08	0	298.92	0	299.65
23	54	299.22	82	299.45	38	299.07	0	299.03	0	298.93	0	299.63
24	50	299.2	85	299.46	36	299.03	0	298.3	0	298.96	0	299.64
25	45	299.15	84	299.47	32	298.98	0	298.97	0	298.96	0	299.61
26	40	299.1	80	299.45	32	298.96	0	298.97	0	298.17	0	299.62
27	36	299.01	85	299.46	38	299.04	0	298.97	0	298.27	0	299.56
28	38	299.03	86	299.46	37	299.05	0	298.96	0	298.27	0	299.55
29	41	299.12	85	299.46			0	298.96	0	299.25	0	299.57
30	43	299.14	78	299.44			0	298.96	0	299.36	0	299.62
31	45	299.15	76	299.43			0	299.04			0	299.62
Ten-Daily Mean												
I Ten-Daily	50.3	299.16	56.1	299.22	45.4	299.12	0	299.04	0	299.13	0	299.51
II Ten-Daily	66	299.26	76.48	299.4	42.4	299.1	0	298.98	0	298.98	0	299.54
III Ten-Daily	43.82	299.13	82.18	299.45	37.48	299.04	0	298.93	0	298.8	0	299.6
Monthly												
Min.	36	299.01	43	299.14	32	298.96	0	298.3	0	298.17	0	299.4
Max.	137	299.65	87	299.48	74	299.4	0	299.08	0	299.44	0	299.83
Mean	53.37	299.19	71.59	299.36	41.76	299.09	0	298.98	0	298.97	0	299.55

Annual Runoff in mm : 102.04

Peak Computed Discharge = 770 cumecs on 23/9/2017 Corres. Water Level 301.58 m

Lowest Computed Discharge = 34cumecs on 9/2/2018 Corres. Water Level 299 m

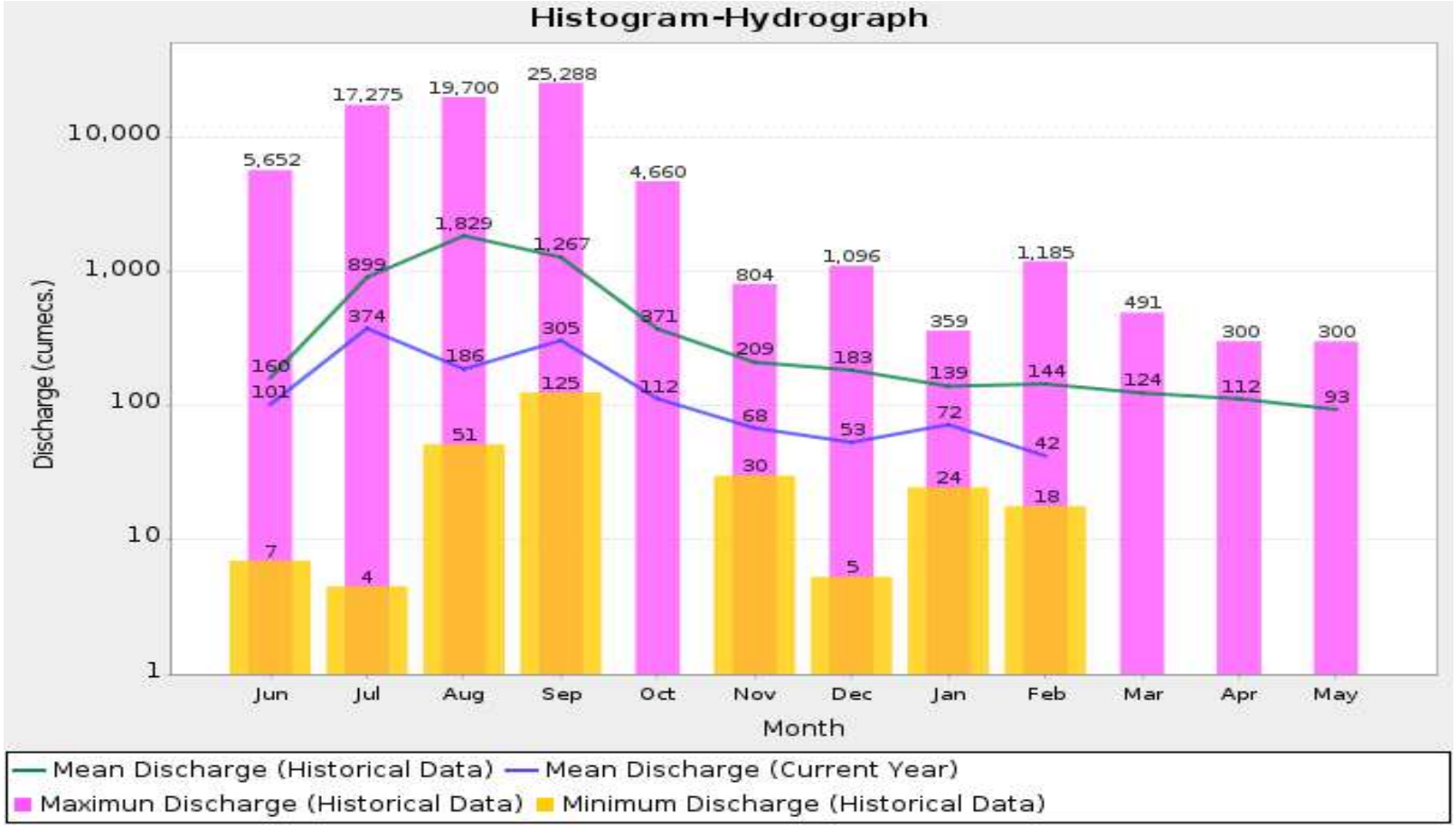
Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge #:Discarded Discharge (values changed as per rating curve)

Note:Missing values ignored while arriving at Annual Runoff

Histogram - Hydrograph for Water Year : 2017-18 (Data considered : 1978-2018)

Station Name : Narmada at Sandia (010215013) Division : Narmada Division, Bhopal

Local River : Narmada Sub-Division : MNSD I, CWC Hoshangabad



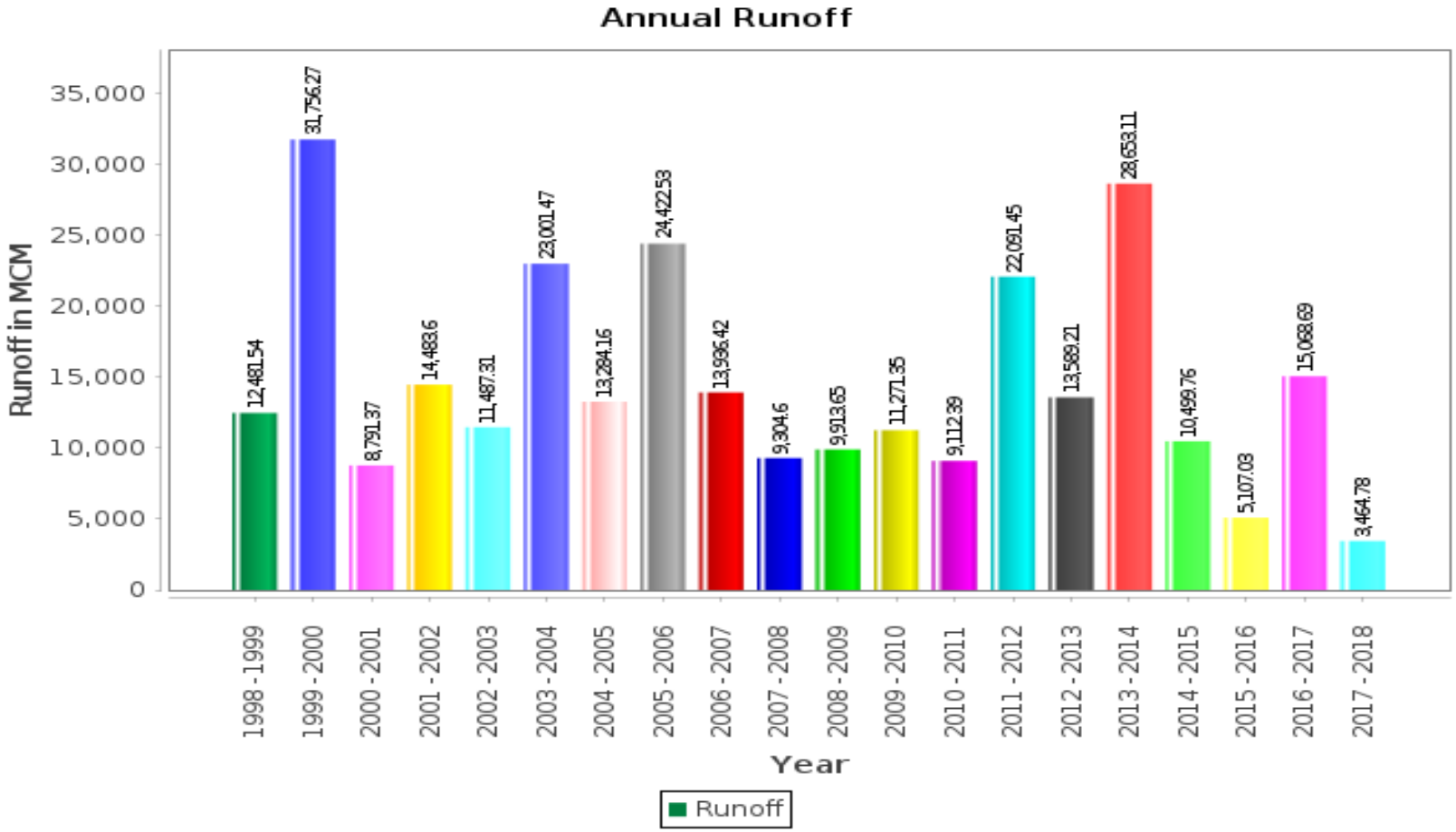
Annual Runoff Values for the period (1978 – 2018)

Station Name : Narmada at Sandia (010215013)

Division : Narmada Division, Bhopal

Local River : Narmada

Sub-Division : MNSD I, CWC Hoshangabad



Note: Missing values have not been considered while arriving at Annual Runoff

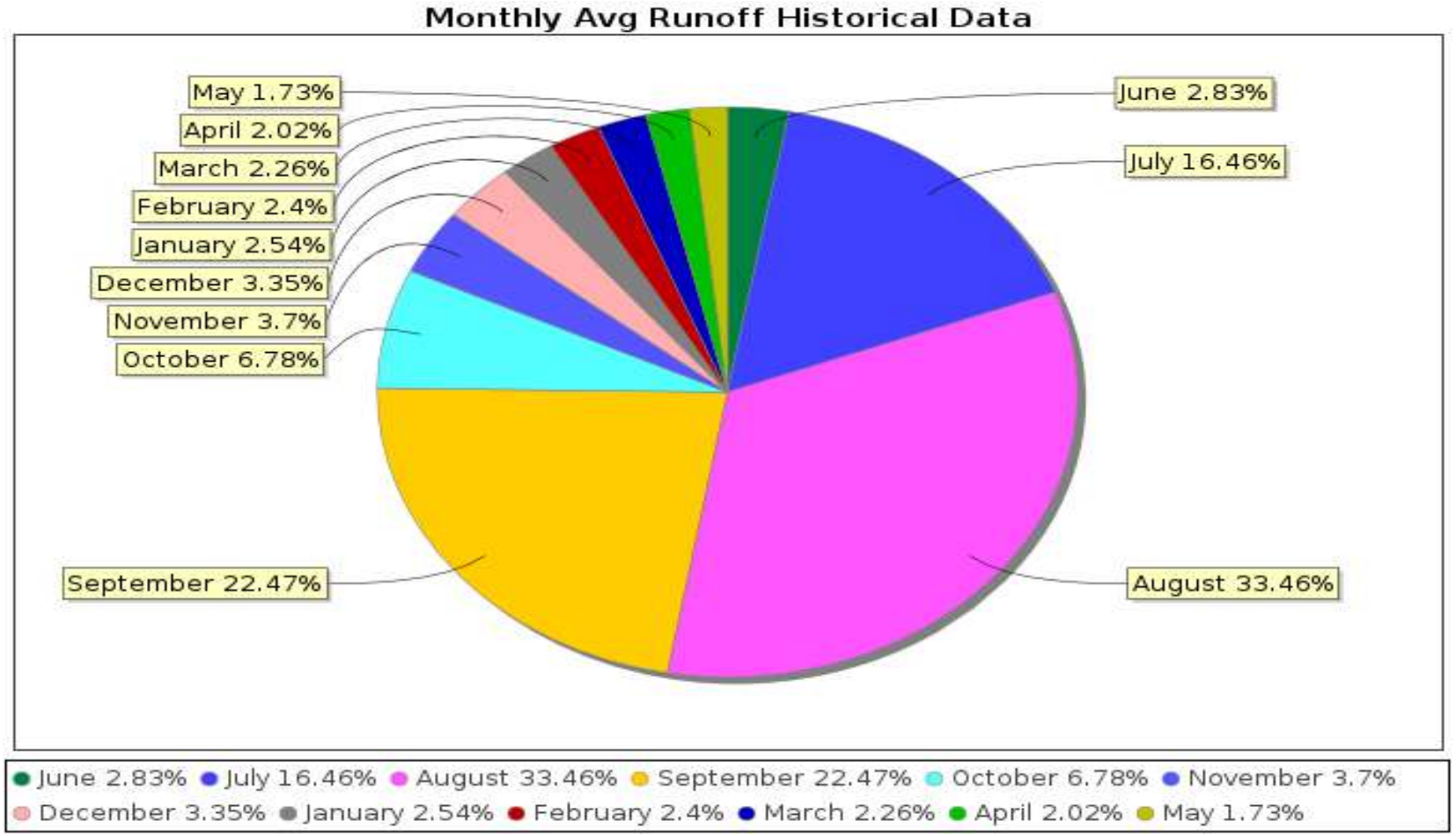
Monthly Average Runoff based on period (1978-2018)

Station Name : Narmada at Sandia (010215013)

Division : Narmada Division, Bhopal

Local River : Narmada

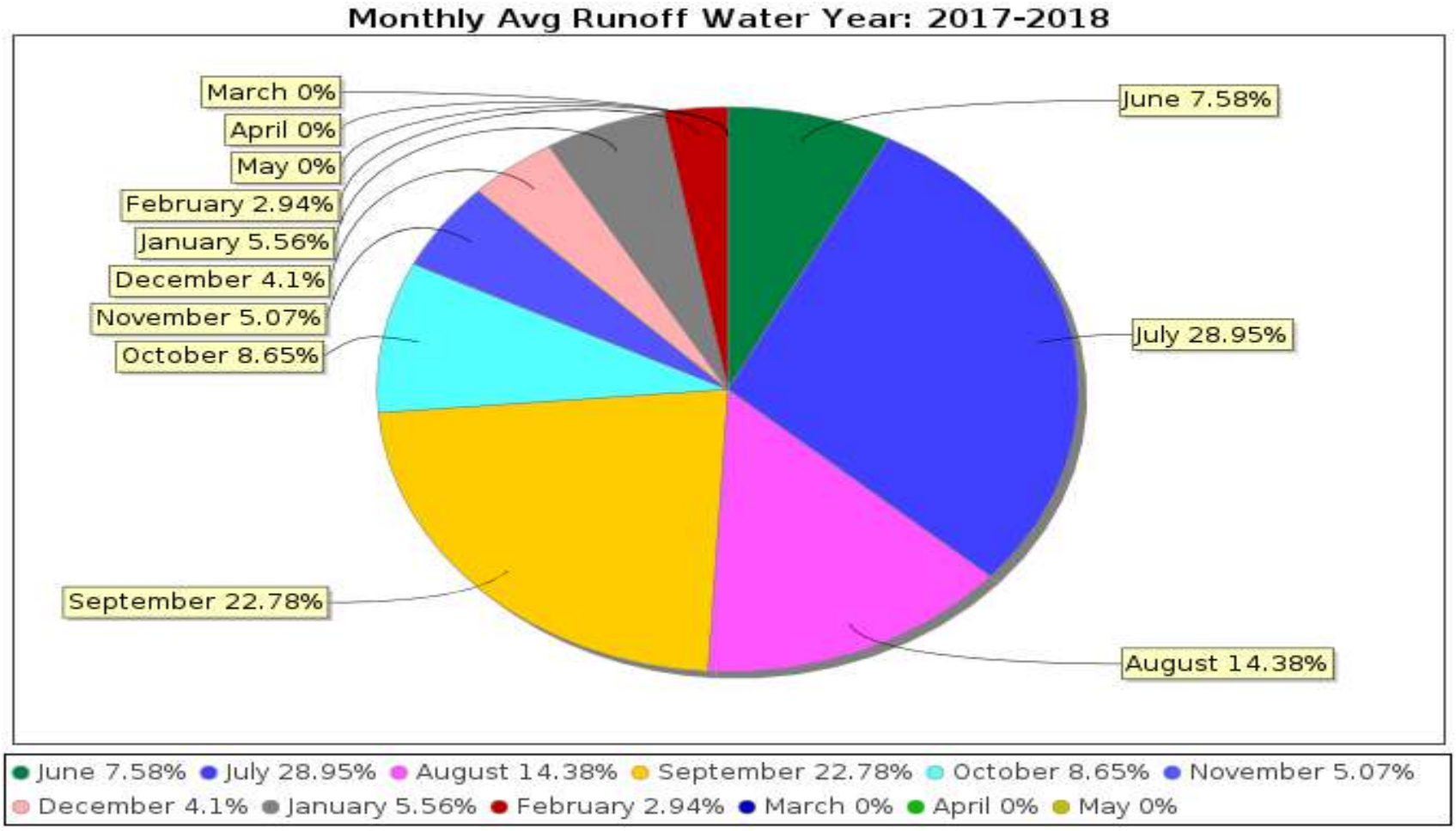
Sub-Division : MNSD I, CWC Hoshangabad



Monthly Runoff for the Year (2017-18)

Station Name : Narmada at Sandia (010215013) Division : Narmada Division, Bhopal

Local River : Narmada Sub-Division : MNSD I, CWC Hoshangabad



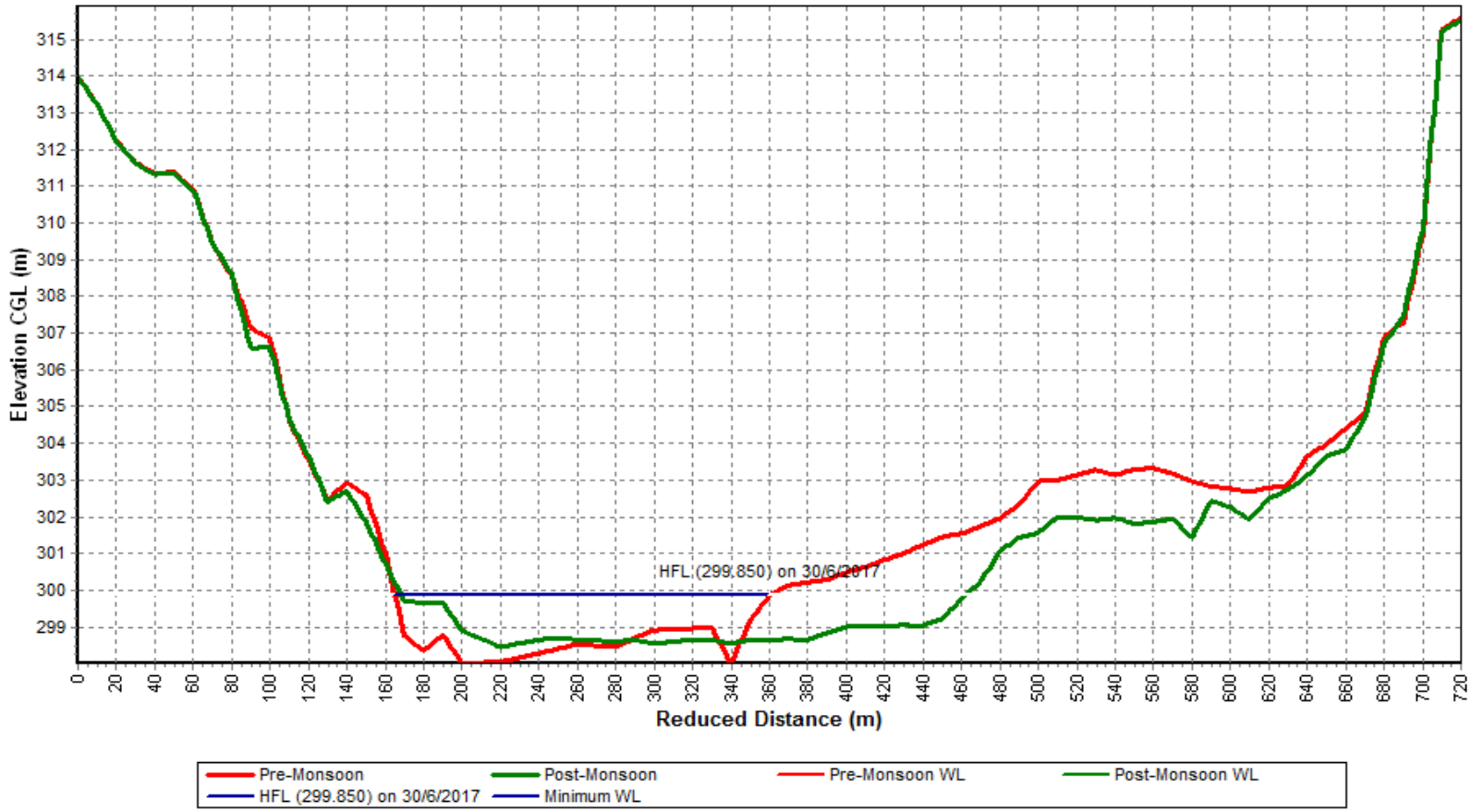
Pre-Monsoon & Post-Monsoon X-Section for Water Year (2017-18)

Station Name : Narmada at Sandia (010215013)

Division : Narmada Division, Bhopal

Local River : Narmada

Sub-Division : MNSD I, CWC Hoshangabad



4.9 Shakkar at Gadarwara

History sheet

HISTORY SHEET (DISCHARGE AND WATER LEVEL)					
			Water Year	:	2017 - 2018
Site	:	Gadarwara	**Code**	:	019-NDBHP
State	:	Madhya Pradesh	**District**	:	Jabalpur
Basin	:	NARMADA	**Independent River**	:	Narmada
Tributary	:	-	**Sub Tributary**	:	-
Sub-Sub Tributary	:	-	**Local River**	:	Shakkar
Division	:	Narmada Division(ND), Bhopal	**Sub-Division**	:	Middle Narmada Sub-Division-I, Hosangabad
Drainage Area	:	2270.0 Sq. Km.	**Bank**	:	Left
Latitude	:	22°55'26''	**Longitude**	:	78°47'30''
Current Zero of Gauge (m)	:	321			

CATEGORY		Opening Date	Closing Date
Gauge	:	01/02/1977	
Discharge	:	01/02/1977	
Sediment	:	15/06/1978	
Water Quality	:		

Reduced Level	Opening Date	Closing Date
321.0	05/01/2017	-
321.0	14/10/2016	05/01/2017
321.0	01/02/1977	14/10/2016

Annual Maximum / Minimum discharge with corresponding Water Level (m.s.l)						
	Maximum			Minimum		
Year	Q (cumecs)	WL (m)	Date	Q (cumecs)	WL (m)	Date
1976-1977	28	322.705	03/02/1977	1.7	322.605	12/04/1977
1977-1978	2734.6	328.175	07/08/1977	1.6	322.59	01/06/1977
1971-1972	0	0	21/02/1972	0	0	21/02/1972
1978-1979	2890	328.58	16/08/1978	2.4	322.85	31/05/1979
1979-1980	1430.8	327.41	09/08/1979	1	322.62	04/04/1980
1980-1981	2822.9	328.81	29/08/1980	0.9	322.635	30/11/1980
1981-1982	724	325.47	24/06/1981	1.2	322.68	08/06/1981
1982-1983	3031	328.745	20/08/1982	1.2	322.82	11/06/1982
1983-1984	2335	328.82	08/09/1983	1.6	322.875	08/06/1983
1984-1985	2850	329.6	18/08/1984	1.2	322.92	30/05/1985
1985-1986	1930	327.85	08/08/1985	1	322.86	23/06/1985
1986-1987	2680	329.8	14/08/1986	1.6	322.89	19/06/1986
1987-1988	1450	326.985	08/09/1987	1	322.93	30/05/1988
1988-1989	2400	328.81	03/08/1988	0.94	322.85	31/05/1989
1989-1990	1605	327.3	16/08/1989	0.8	322.84	12/06/1989
1990-1991	2300	328.4	05/09/1990	1.08	322.995	11/06/1990
1991-1992	1046	326.32	19/08/1991	1.06	322.925	07/07/1991
1992-1993	1590	327.4	20/08/1992	1.2	322.92	10/07/1992
1993-1994	1880	328.15	16/07/1993	1.73	322.915	06/06/1993
1994-1995	2720	330.18	19/08/1994	1.7	322.96	29/05/1995
1995-1996	1160	326.65	25/07/1995	0.25	322.62	30/05/1996
1996-1997	608	325.15	27/07/1996	0	322.47	22/04/1997
1997-1998	1732	328	25/07/1997	0	0	01/06/1997
1998-1999	836	326	05/07/1998	0.25	323.05	28/06/1998
1999-2000	5850	332.47	18/09/1999	0.15	322.81	21/05/2000
2000-2001	1310	327.1	28/07/2000	0.85	322.81	06/06/2000
2001-2002	1030	326.48	19/07/2001	0.5	322.63	27/05/2002
2002-2003	2750	328.85	06/09/2002	0.3	322.9	30/05/2003
2003-2004	2700	328.45	24/07/2003	0.21	322.87	15/06/2003
2004-2005	940	327.1	22/08/2004	0.11	322.77	29/05/2005
2005-2006	1828.4	326.25	01/08/2005	0.02	322.72	19/06/2005
2006-2007	4650.38	329	14/08/2006	0.01	323.13	19/05/2007
2007-2008	3279.69	329	08/07/2007	0	0	24/05/2008
2008-2009	237.39	324.25	05/08/2008	0.04	322.79	02/02/2009
2009-2010	3278.58	329.88	09/09/2009	0	0	01/06/2009
2010-2011	901.36	325.7	07/08/2010	0	0	01/06/2010
2011-2012	736.19	324.6	15/07/2011	0	0	01/06/2011

2012-2013	1866	326.35	21/08/2012	0	0	21/04/2013
2013-2014	2898.65	328.58	23/08/2013	0	0	01/06/2013
2014-2015	554.43	325.23	23/07/2014	0.16	322.33	31/05/2015
2015-2016	493.83	324.54	14/08/2015	0.01	322.23	03/03/2016
2016-2017	10138	323.72	26/10/2016	0	0	01/05/2017
2017-2018	468.7	324.54	21/07/2017	0	321	02/06/2017

Stage Discharge Sheet for Shakkar at Gadarwara for the period 2017-18

Day	June		July		August		September		October		November	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	0	321	10.54	322.76	86.31	323.52	160.2	323.75	52.17	323.37	8.62	322.76
2	0	321	10.8	322.85	96.4	323.55	129.2	323.66	49.5	323.36	8.65	322.76
3	0	321	10.82	322.87	98.57	323.56	102.8	323.58	50.48	323.36	8.62	322.76
4	0	321	9.84	322.69	108.01	323.6	96.6	323.55	42.66	323.33	8.53	322.75
5	0	321	10.46	322.83	96.5	323.55	73.89	323.49	32.22	323.31	8.53	322.75
6	0	321	10.57	322.76	76.5	323.5	59.08	323.42	23.77	323.29	8.34	322.74
7	0	321	10.32	322.74	73.45	323.49	56.26	323.4	21.01	323.28	8.34	322.74
8	0	321	9.89	322.69	95.92	323.55	96.44	323.55	21.02	323.28	8.27	322.74
9	0	321	10.6	322.79	101.04	323.57	86.52	323.52	24.16	323.29	8.02	322.73
10	0	321	10.87	322.87	115.52	323.63	57.5	323.41	15.88	323.25	7.82	322.72
11	0	321	12.35	322.92	131.21	323.69	57.52	323.41	14.25	323.22	7.77	322.72
12	0	321	11.31	322.83	108.6	323.6	75.94	323.5	14.78	323.23	7.78	322.72
13	0	321	10.57	322.76	73.45	323.49	124.13	323.65	14.04	323.21	7.54	322.71
14	0	321	11.97	322.89	112.58	323.62	96.69	323.55	14.96	323.23	7.54	322.71
15	0	321	12.89	322.97	96.4	323.55	103.18	323.58	42.65	323.32	7.32	322.7
16	0	321	12.4	322.92	67.08	323.47	86.66	323.52	15.8	323.25	7.3	322.7
17	0	321	10.41	322.75	52.16	323.37	86.66	323.52	14.97	323.23	7.1	322.69
18	0	321	10.62	322.76	59.32	323.42	96.86	323.55	13.86	323.2	7.1	322.69
19	0	321	12.34	322.92	102.8	323.58	171.13	323.78	13.86	323.2	6.9	322.68
20	0	321	181.54	323.85	158.33	323.73	111.76	323.61	13.14	323.18	6.9	322.68
21	0	321	468.7	324.54	103.07	323.58	114.89	323.62	12.67	323.15	6.71	322.67
22	0	321	195.54	323.95	96.58	323.55	172.82	323.82	12.41	323.12	6.7	322.67
23	0	321	186.89	323.87	74.24	323.49	170.24	323.78	12.32	323.1	6.71	322.67
24	0	321	187.25	323.88	86.38	323.52	129.23	323.66	11.04	323.05	6.52	322.66
25	0	321	163.6	323.8	70.98	323.48	96.68	323.55	10.74	322.96	6.49	322.66
26	0	321	158.33	323.73	70.98	323.48	75.6	323.49	10.32	322.92	6.5	322.66
27	0	321	163.6	323.8	98.57	323.56	79.76	323.5	8.88	322.87	6.29	322.65
28	9.49	322.66	163.58	323.8	50.97	323.36	68.7	323.47	9.6	322.84	6.28	322.65
29	10.23	322.72	160.29	323.75	96.82	323.55	59.42	323.42	9.43	322.82	6.1	322.64
30	9.81	322.69	115.5	323.63	160.24	323.75	56.26	323.4	8.97	322.8	6.09	322.64
31			129.2	323.66	176.05	323.83			8.8	322.78		
I Ten-Daily												
II Ten-Daily	0	321	10.47	322.79	94.82	323.55	91.85	323.53	33.29	323.31	8.37	322.75
III Ten-Daily	0	321	28.64	322.96	96.19	323.55	101.05	323.57	17.23	323.23	7.32	322.7
Monthly	2.95	321.51	190.22	323.86	98.62	323.56	102.36	323.57	10.47	322.95	6.44	322.66
Min.												
Max.	0	321	9.84	322.69	50.97	323.36	56.26	323.4	8.8	322.78	6.09	322.64
Mean	10.23	322.72	468.7	324.54	176.05	323.83	172.82	323.82	52.17	323.37	8.65	322.76

Annual Runoff in MCM : 811.97

Peak Observed Discharge = 468.7 cumecs on 21/7/2017 Corres. Water Level 324.54 m

Lowest Observed Discharge = 0cumecs on 3/3/2018 Corres. Water Level 321 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge #:Discarded Discharge (values changed as per rating curve)
Note:Missing values ignored while arriving at Annual Runoff

Stage Discharge Sheet for Shakkar at Gadarwara for the period 2017-18

Day	December		January		February		March		April		May	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	6.08	322.64	0.9	322.38	0	322.18	0	321	0	321	0	321
2	5.9	322.63	0.9	322.38	0	322.17	0	321	0	321	0	321
3	5.9	322.63	0.9	322.38	0	322.16	0	321	0	321	0	321
4	5.9	322.63	0	322.37	0	322.16	0	321	0	321	0	321
5	5.9	322.63	0	322.37	0	322.15	0	321	0	321	0	321
6	5.7	322.62	0	322.35	0	322.15	0	321	0	321	0	321
7	5.7	322.62	0	322.35	0	322.14	0	321	0	321	0	321
8	5.3	322.6	0	322.35	0	322.14	0	321	0	321	0	321
9	5.05	322.59	0	322.34	0	322.13	0	321	0	321	0	321
10	4.4	322.57	0	322.34	0	322.13	0	321	0	321	0	321
11	3.7	322.55	0	322.33	0	322.13	0	321	0	321	0	321
12	3.2	322.54	0	322.33	0	322.13	0	321	0	321	0	321
13	2.95	322.53	0	322.32	0	322.14	0	321	0	321	0	321
14	2.8	322.52	0	322.32	0	322.13	0	321	0	321	0	321
15	2.8	322.52	0	322.32	0	322.13	0	321	0	321	0	321
16	2.7	322.51	0	322.31	0	322.12	0	321	0	321	0	321
17	2.1	322.49	0	322.31	0	322.12	0	321	0	321	0	321
18	1.65	322.46	0	322.3	0	322.11	0	321	0	321	0	321
19	1.55	322.45	0	322.3	0	322.11	0	321	0	321	0	321
20	1.55	322.45	0	322.29	0	322.1	0	321	0	321	0	321
21	1.45	322.44	0	322.29	0	322.1	0	321	0	321	0	321
22	1.12	322.42	0	322.28	0	322.1	0	321	0	321	0	321
23	1.12	322.42	0	322.28	0	322.09	0	321	0	321	0	321
24	1.05	322.41	0	322.27	0	322.09	0	321	0	321	0	321
25	1.05	322.41	0	322.24	0	322.09	0	321	0	321	0	321
26	1	322.4	0	322.22	0	322.08	0	321	0	321	0	321
27	1	322.4	0	322.21	0	322.08	0	321	0	321	0	321
28	1	322.4	0	322.21	0	322.08	0	321	0	321	0	321
29	1	322.4	0	322.2			0	321	0	321	0	321
30	0.95	322.39	0	322.19			0	321	0	321	0	321
31	0.95	322.39	0	322.18			0	321			0	321
Ten-Daily Mean												
I Ten-Daily	5.58	322.62	0.27	322.36	0	322.15	0	321	0	321	0	321
II Ten-Daily	2.5	322.5	0	322.31	0	322.12	0	321	0	321	0	321
III Ten-Daily	1.06	322.41	0	322.23	0	322.09	0	321	0	321	0	321
Monthly												
Min.	0.95	322.39	0	322.18	0	322.08	0	321	0	321	0	321
Max.	6.08	322.64	0.9	322.38	0	322.18	0	321	0	321	0	321
Mean	3.05	322.51	0.09	322.3	0	322.12	0	321	0	321	0	321

Annual Runoff in mm : 357.69

Peak Computed Discharge = 186.89 cumecs on 23/7/2017 Corres. Water Level 323.87 m

Lowest Computed Discharge = 0cumecs on 2/6/2017 Corres. Water Level 321 m

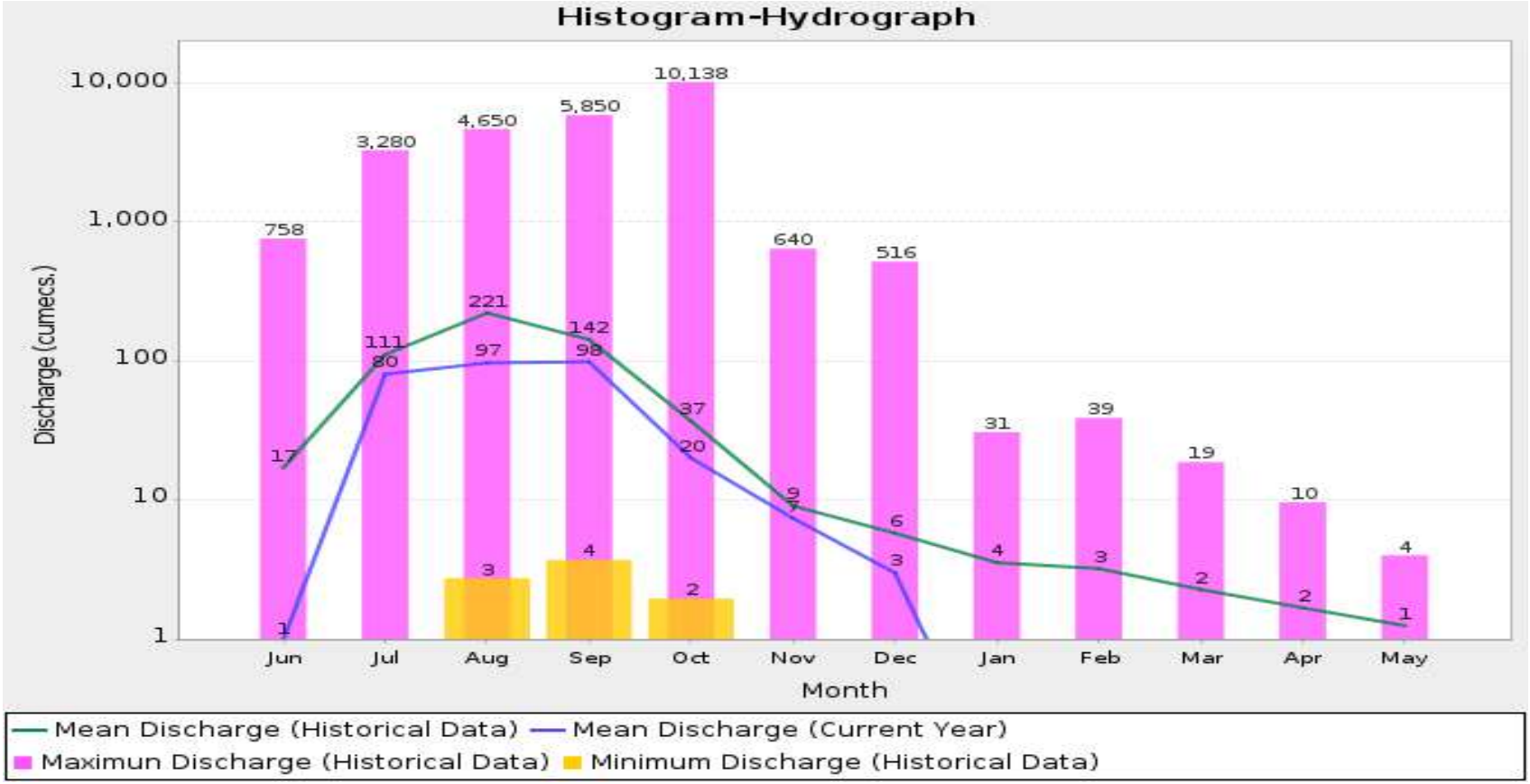
Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge #:Discarded Discharge (values changed as per rating curve)

Note:Missing values ignored while arriving at Annual Runoff

Histogram - Hydrograph for Water Year : 2017-18 (Data considered : 1977-2018)

Station Name : Shakkar at Gadarwara (010215012) Division : Narmada Division, Bhopal

Local River : Shakkar Sub-Division : MNSD I, CWC Hoshangabad



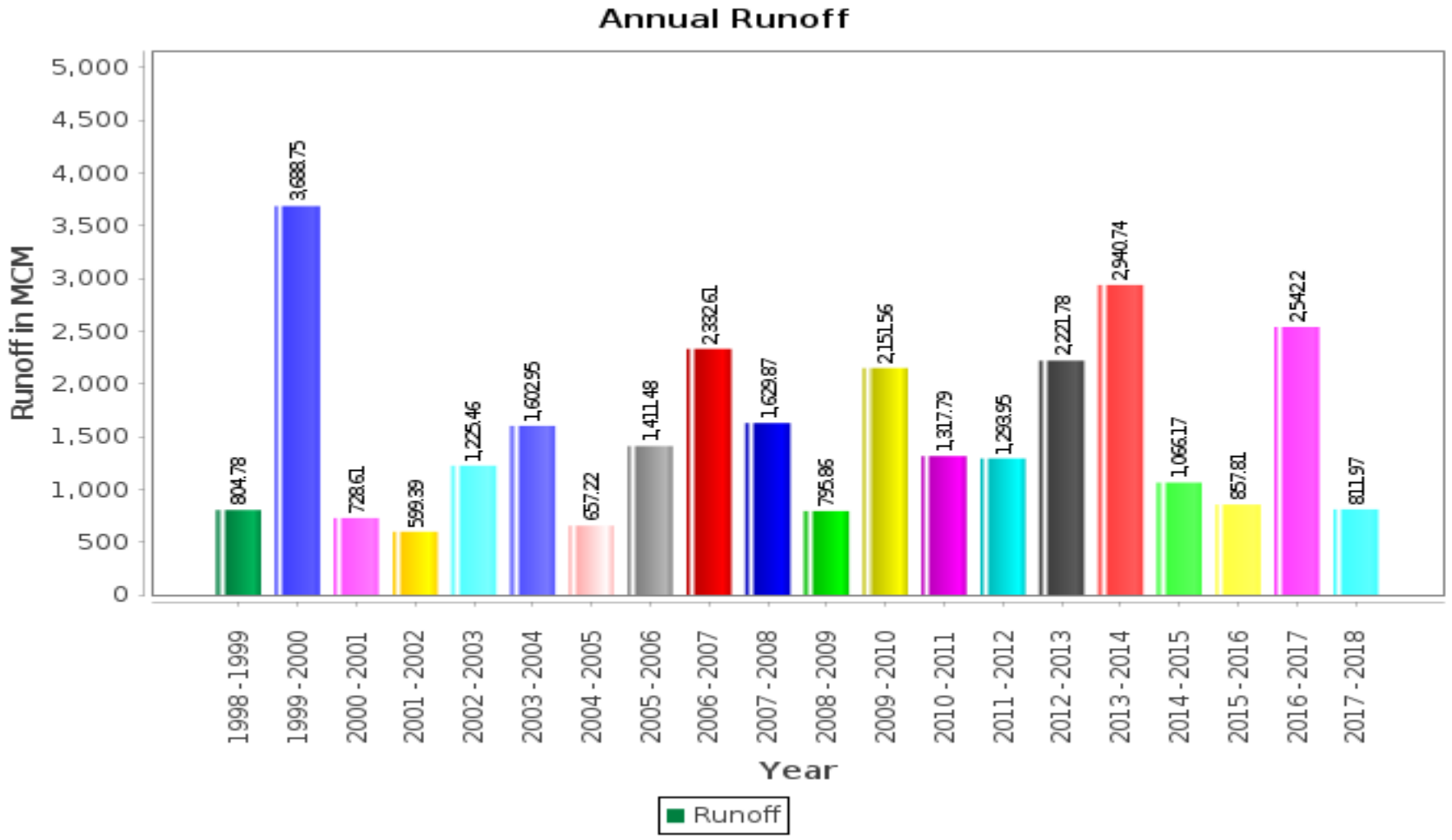
Annual Runoff Values for the period (1977 – 2018)

Station Name : Shakkar at Gadarwara (010215012)

Division : Narmada Division, Bhopal

Local River : Shakkar

Sub-Division : MNSD I, CWC Hoshangabad



Note: Missing values have not been considered while arriving at Annual Runoff

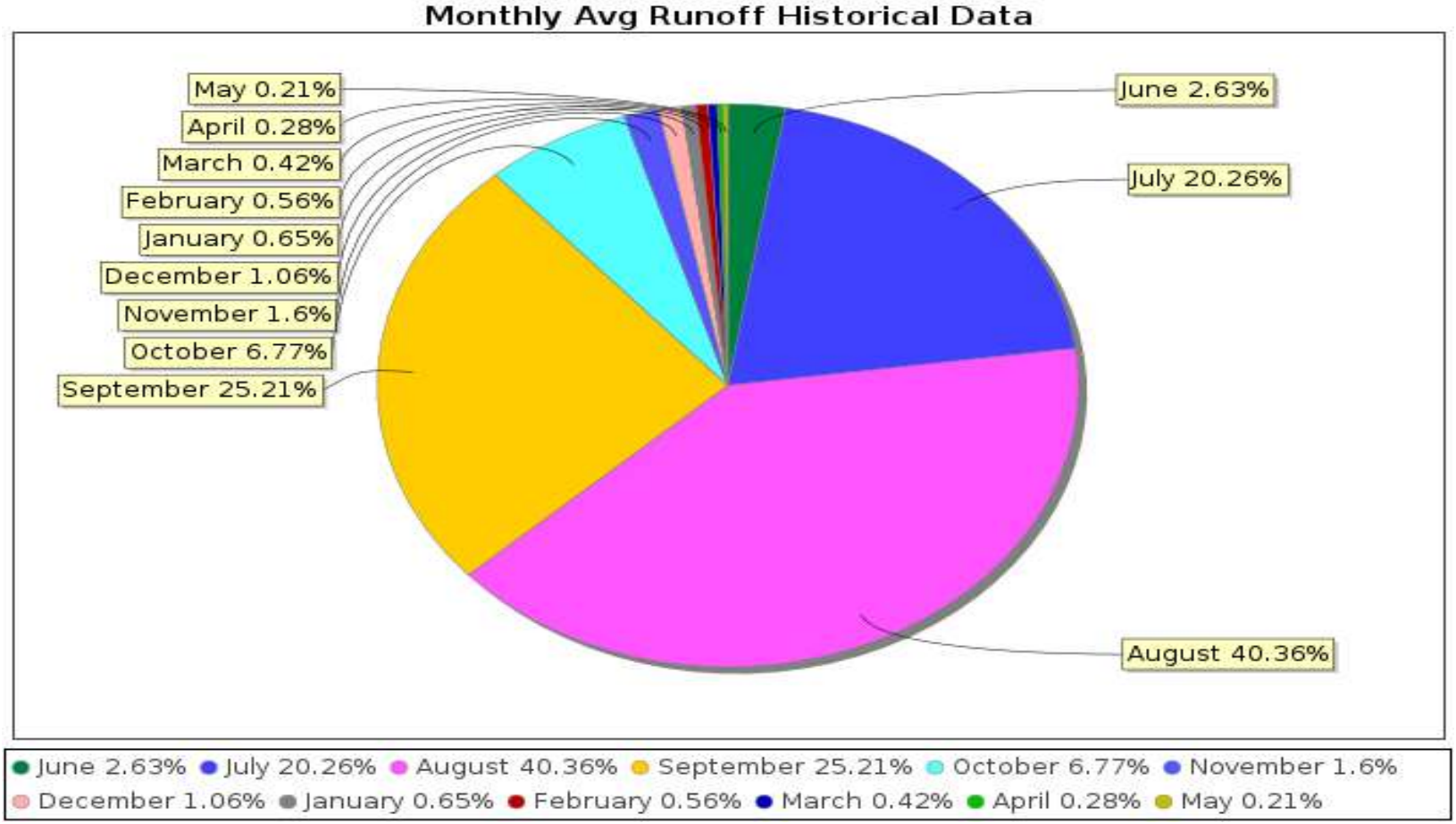
Monthly Average Runoff based on period (1977 – 2018)

Station Name : Shakkar at Gadarwara (010215012)

Division : Narmada Division, Bhopal

Local River : Shakkar

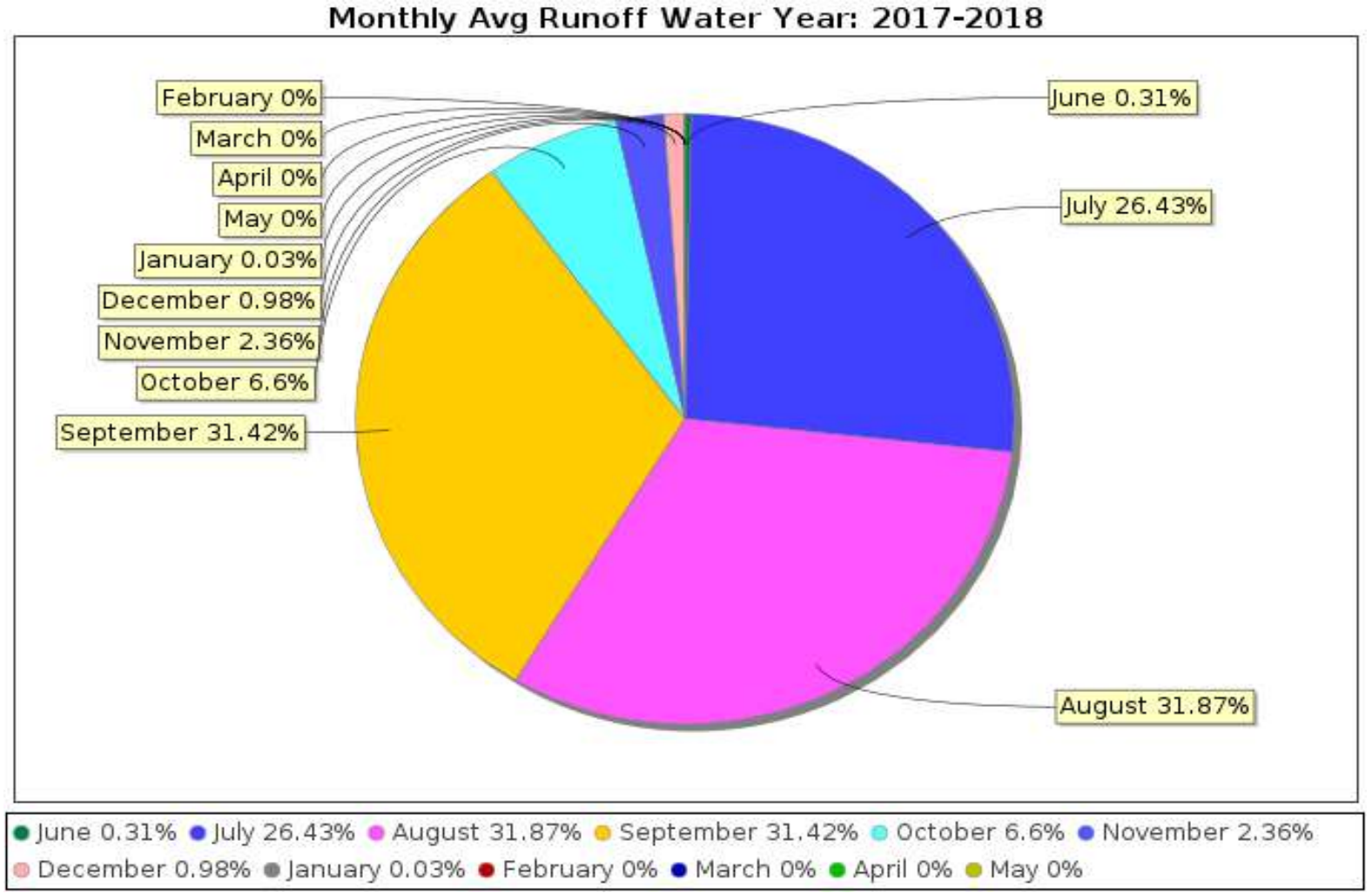
Sub-Division : MNSD I, CWC Hoshangabad



Monthly Runoff for the Year (2017-18)

Station Name : Shakkar at Gadarwara (010215012) Division : Narmada Division, Bhopal

Local River : Shakkar Sub-Division : MNSD I, CWC Hoshangabad



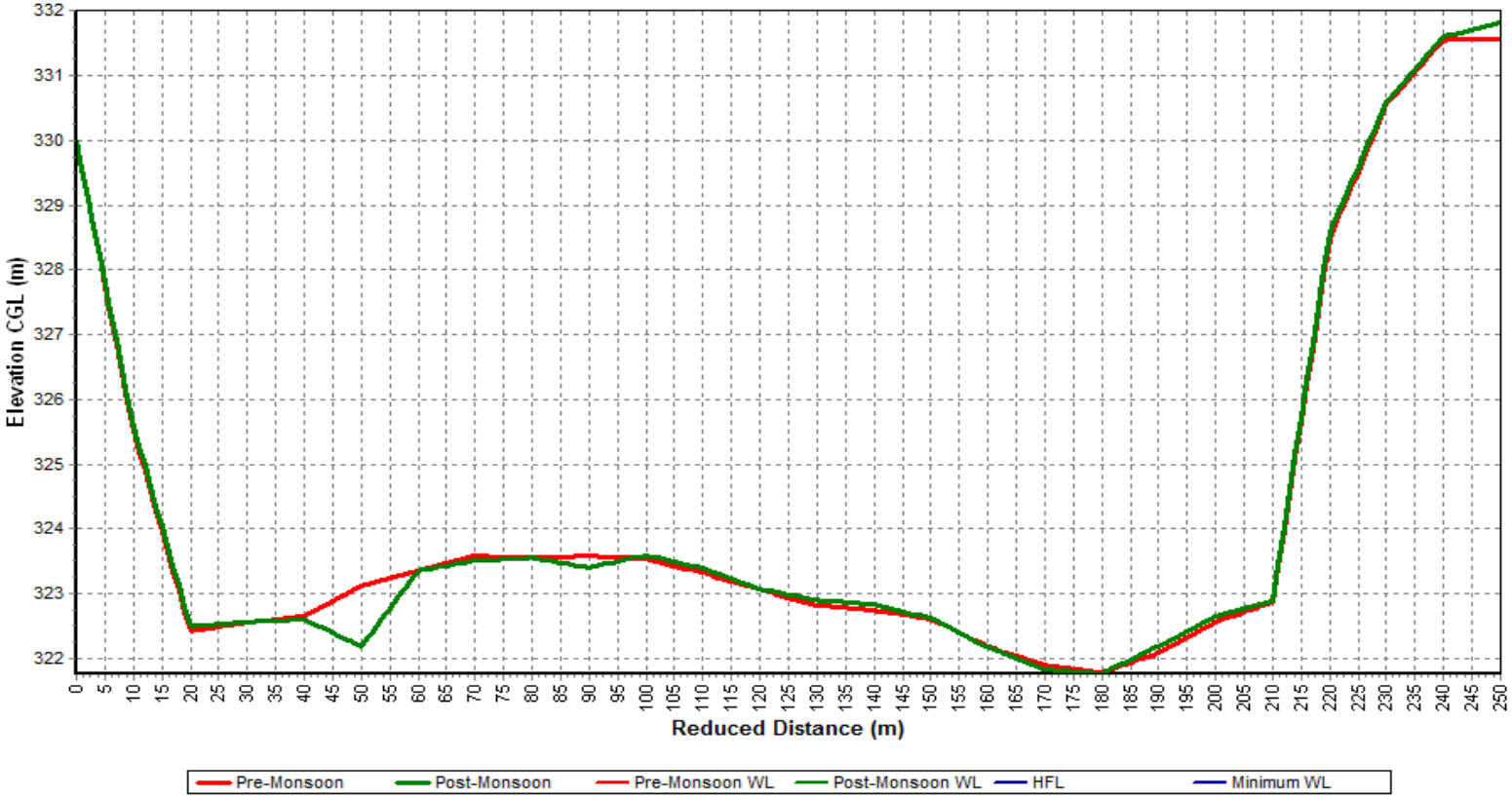
Pre-Monsoon & Post-Monsoon X-Section for Water Year (2017-18)

Station Name : Shakkar at Gadarwara (010215012)

Division : Narmada Division, Bhopal

Local River : Shakkar

Sub-Division : MNSD I, CWC Hoshangabad



4.10 Narmada at Barmanghat

History Sheet

HISTORY SHEET (DISCHARGE AND WATER LEVEL)

			Water Year	:	2017 - 2018
Site	:	Barmanghat	**Code**	:	012-NDBHP
State	:	Madhya Pradesh	**District**	:	Hoshangabad
Basin	:	NARMADA	**Independent River**	:	Narmada
Tributary	:	-	**Sub Tributary**	:	-
Sub-Sub Tributary	:	-	**Local River**	:	Narmada
Division	:	Narmada Division(ND), Bhopal	**Sub-Division**	:	Middle Narmada Sub-Division-I, Hosangabad
Drainage Area	:	26453.0 Sq. Km.	**Bank**	:	Right
Latitude	:	23°1'51''	**Longitude**	:	79°0'55''
Current Zero of Gauge (m)	:	306			

CATEGORY		Opening Date	Closing Date
Gauge	:	09/12/1970	
Discharge	:	20/11/1971	
Sediment	:	27/08/1972	
Water Quality	:		

Reduced Level	Opening Date	Closing Date
306.0	01/12/2013	-
0.0	31/05/2014	31/05/2015
306.0	01/03/2017	-
306.0	01/01/2015	-
306.0	01/06/2013	31/12/2014

Annual Maximum / Minimum discharge with corresponding Water Level (m.s.l)						
	Maximum			Minimum		
Year	Q (cumecs)	WL (m)	Date	Q (cumecs)	WL (m)	Date
1970-1971	0	309.75	25/05/1971	0	309.75	25/05/1971
1971-1972	199.2	310.005	20/11/1971	10.7	308.28	28/05/1972
1972-1973	16193.5	330.185	31/08/1972	8.7	308.125	19/06/1972
1973-1974	20658.2	330.455	30/08/1973	8	307.62	10/06/1973
1974-1975	17288.2	329.25	19/08/1974	6.1	307.56	31/05/1975
1975-1976	15847.8	328.205	23/08/1975	5.4	307.558	16/06/1975
1976-1977	3074.3	315.44	16/08/1976	5.9	307.47	17/05/1977
1977-1978	13455.2	326.838	08/08/1977	5.7	307.46	03/06/1977
1978-1979	6961.5	311.248	30/07/1978	10	307.64	09/06/1978
1979-1980	8158.1	322.175	10/08/1979	4.6	307.37	30/05/1980
1980-1981	12375	326.725	30/08/1980	4.5	307.37	01/06/1980
1981-1982	2904	315.155	29/07/1981	4	307.445	18/05/1982
1982-1983	4641.6	317.702	18/08/1982	5.5	307.425	02/06/1982
1983-1984	14890.5	325.625	09/09/1983	2.9	307.565	31/05/1984
1984-1985	12220	327.6	19/08/1984	3	307.565	04/06/1984
1985-1986	6860	321.4	09/08/1985	7.8	307.555	07/06/1985
1986-1987	3170	317.36	23/07/1986	1.2	307.52	01/06/1986
1987-1988	10800	323.715	18/09/1987	4.54	307.465	05/06/1987
1988-1989	11200	324.03	05/08/1988	3.4	307.5	27/04/1989
1989-1990	2750	315.67	06/08/1989	5.23	307.47	03/06/1989
1990-1991	7200	320.42	20/09/1990	22.38	307.57	02/06/1990
1991-1992	19500	329.24	24/08/1991	27	307.75	17/01/1992
1992-1993	9400	323.45	12/09/1992	18.68	307.81	05/03/1993
1993-1994	7100	319.63	28/09/1993	20	307.7	08/06/1993
1994-1995	15600	327.22	21/07/1994	51	308.31	04/06/1994
1995-1996	10000	323.59	11/08/1995	46	307.92	12/11/1995
1996-1997	1750	313.17	21/08/1996	19	307.5	04/06/1996
1997-1998	5700	319.08	03/08/1997	56.63	307.9	26/06/1997
1998-1999	3900	316.15	15/09/1998	21.44	307.58	24/05/1999
1999-2000	21500	329.26	19/09/1999	19.8	307.6	06/06/1999
2000-2001	5900	318.97	28/07/2000	30.87	307.7	23/05/2001
2001-2002	6950	320.16	15/07/2001	31	307.71	31/03/2002
2002-2003	9800	323.5	18/08/2002	25.15	307.38	22/03/2003
2003-2004	6800	320.17	05/09/2003	65.14	307.93	12/05/2004
2004-2005	12300	323.8	23/08/2004	30	307.62	11/06/2004
2005-2006	10452.2	323.555	16/09/2005	18.69	307.55	25/06/2005

2006-2007	4752.72	318.38	31/08/2006	24.27	307.56	23/06/2006
2007-2008	818.66	311.48	09/07/2007	30.89	307.6	05/05/2008
2008-2009	4051.12	316.935	02/08/2008	36.02	307.7	15/01/2009
2009-2010	7727.63	321.3	09/09/2009	25.54	307.59	30/06/2009
2010-2011	2535.61	314.93	20/09/2010	37.46	307.55	20/04/2011
2011-2012	8131.4	322	09/09/2011	36.82	307.5	26/05/2012
2012-2013	4040.76	317.75	13/08/2012	29.4	307.61	08/06/2012
2013-2014	1	0	17/03/2014	1	0	17/03/2014
2014-2015	236	309.15	19/03/2015	70.7	307.8	30/04/2015
2015-2016	1881.21	313.94	05/08/2015	24.8	307.38	13/04/2016
2016-2017	6091	319.12	08/08/2016	31.9	307.64	02/06/2016
2017-2018	1017	312.13	22/07/2017	17	307.35	18/02/2018

Stage Discharge Sheet for Narmada at Barmanghat for the period 2017-18

Day	June		July		August		September		October		November	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	34.4	307.74	273.6	309.52	119	308.35	137	308.5	68	308	58.9	307.7
2	56.4	307.68	258	309.46	96.3	308.15	152	308.7	65	307.94	60.4	307.76
3	61	307.84	245	309.06	84.9	308.07	123	308.38	69.8	307.85	69.5	307.86
4	59	307.78	186	308.86	68.5	307.82	93	308.14	65.1	307.84	63	307.8
5	72.6	307.97	166	308.78	58.9	307.74	77.7	307.94	63.6	307.8	60	307.77
6	72.3	308.05	141	308.59	50	307.68	69.5	307.86	65.4	307.8	58.9	307.74
7	64.34	307.8	135	308.5	57.4	307.65	65.4	307.82	67.8	307.86	52.9	307.69
8	60.6	307.79	120	308.45	99.5	308.21	58.8	307.76	62	307.85	48.6	307.64
9	63.3	307.86	115	308.41	160	308.67	57.8	307.74	64.4	307.8	33.8	307.56
10	48.6	307.66	125	308.41	123	308.39	100	308.2	86.2	307.86	74	307.9
11	56	307.82	120	308.38	107	308.24	118	308.28	74	307.9	91.2	308.1
12	58	307.85	117	308.39	88.3	308.08	164	308.55	77.7	307.98	100	308.2
13	59.5	307.9	117	308.37	76	308.04	201	309	74.1	307.89	118	308.28
14	62.3	307.86	127	308.49	54.6	307.8	130	308.41	75.3	307.9	104	308.18
15	63.3	307.87	152	308.63	52	307.79	117	308.3	97	308.16	77.7	307.95
16	68.7	307.88	158	308.73	47	307.69	108.8	308.22	83	308.09	58.9	307.76
17	80	308.04	150	308.67	41.6	307.61	115	308.26	69.5	307.86	48.7	307.62
18	60	307.91	122	308.28	74.1	307.88	86.3	308.04	73.6	307.87	40.2	307.5
19	66.6	307.9	129	308.44	74.2	307.94	218	309.08	92	308.12	40	307.48
20	79	308	632.1	310.99	53	307.8	150	308.54	76.1	307.9	38	307.58
21	105	308.17	1008	312.1	60.4	307.77	201	309	83.4	307.94	25.7	307.46
22	74.2	307.97	1017	312.13	73.6	307.88	244	309.24	98	308.17	19.4	307.38
23	65.2	307.83	700	311.18	58.9	307.76	320	309.77	82	307.94	17.2	307.35
24	48.5	307.73	409.7	310.24	52.9	307.69	280	309.6	68.5	307.82	26.3	307.44
25	74	308.03	380.5	310.1	70.98	307.48	207	308.98	58.8	307.76	34.3	307.48
26	122	308.37	296.2	309.64	244	309.25	164	308.68	74.2	307.95	40	307.5
27	150	308.56	196	309	320	309.84	137	308.48	98.3	308.16	21.8	307.45
28	109	308.28	156	308.6	215	309	120	308.35	93	308.13	22.7	307.42
29	144	308.5	242	309.18	206	309	105	308.21	52	307.7	27.8	307.47
30	136	308.48	160	308.98	173	308.74	77	308.05	92	308.08	35.5	307.54
31			156	308.65	156	308.6			72.3	308.04		
Ten-Daily Mean												
I Ten-Daily	67.73	307.86	58	307.74	139.45	308.48	39.62	307.6	67.73	307.86	58	307.74
II Ten-Daily	79.23	307.97	71.67	307.87	160.8	308.64	65.08	307.88	79.23	307.97	71.67	307.87
III Ten-Daily	79.32	307.97	27.07	307.45	149.36	308.55	70.15	307.93	79.32	307.97	27.07	307.45
Monthly												
Min.	52	307.7	17.2	307.35	97.5	308.13	27.2	307.48	52	307.7	17.2	307.35
Max.	98.3	308.17	118	308.28	219	309.07	92	308.03	98.3	308.17	118	308.28
Mean	75.43	307.93	52.25	307.69	149.87	308.55	58.28	307.8	75.43	307.93	52.25	307.69

Annual Runoff in MCM : 2933.71

Peak Observed Discharge = 1017 cumecs on 22/7/2017 Corres. Water Level 312.13 m

Lowest Observed Discharge = 17.2cumecs on 9/2/2018 Corres. Water Level 307.35 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge #:Discarded Discharge (values changed as per rating curve)

Note:Missing values ignored while arriving at Annual Runoff

Stage Discharge Sheet for Narmada at Barmanghat for the period 2017-18

Day	December		January		February		March		April		May	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	150	308.56	35.5	307.56	66.7	307.8	23.2	307.37	23.2	307.38	58.9	307.71
2	154	308.6	31.1	307.5	49.2	307.71	23	307.37	23.3	307.38	60.6	307.77
3	149	308.52	35.1	307.54	58.4	307.64	23.9	307.36	23	307.36	62	307.75
4	144	308.5	46.4	307.63	48	307.6	23	307.36	37.2	307.5	68.7	307.88
5	97.5	308.13	38.1	307.59	35.5	307.54	24	307.35	27.8	307.48	73.2	307.86
6	151	308.54	27.2	307.51	31.2	307.48	27.4	307.35	40.3	307.55	65	307.82
7	165	308.62	29.2	307.48	21.8	307.45	26.3	307.42	44.5	307.66	82.8	307.97
8	136	308.48	47.1	307.74	22.7	307.42	26.4	307.45	21	307.45	78.7	308.1
9	132	308.42	63.7	307.78	17.2	307.35	23.3	307.43	17.2	307.34	92	308.15
10	116	308.38	42.8	307.65	24.8	307.38	19.4	307.38	18.7	307.37	84.6	308.08
11	108	308.32	40.6	307.62	20	307.4	19	307.38	22.7	307.42	89.9	308.1
12	214	309	40.3	307.62	25.6	307.44	35	307.46	25.6	307.46	94	308.16
13	218	309.07	59.5	307.9	31.1	307.5	38	307.53	29.1	307.48	100	308.2
14	187	308.84	74.2	307.95	35	307.54	31.9	307.6	29	307.48	82.4	308.06
15	155	308.6	77.7	307.94	26.4	307.46	48.6	307.66	30	307.5	85	308.11
16	121	308.34	76.2	307.97	26.3	307.42	52.9	307.7	21.2	307.39	86.3	308.11
17	112	308.22	79.9	307.99	18.7	307.37	57	307.74	22.7	307.43	93.1	308.2
18	106	308.3	76.9	307.98	17	307.35	60	307.78	31.2	307.48	80.2	308.06
19	168	308.7	62.4	307.92	23.3	307.43	61.5	307.78	35.9	307.51	83	308.15
20	219	308.96	63.1	307.88	27.2	307.5	59	307.76	38	307.56	100	308.21
21	200	308.91	60	307.87	48.7	307.62	49.2	307.72	20	307.36	105	308.31
22	182	308.8	58.8	307.85	40.3	307.58	47.2	307.69	20	307.35	99.2	308.28
23	168	308.73	65.1	307.82	40.2	307.5	46.4	307.65	23.4	307.34	108	308.32
24	155	308.58	71.3	307.95	35	307.53	43.5	307.6	35.9	307.48	97.9	308.26
25	144	308.5	92	308.03	29	307.48	36	307.56	53.7	307.67	103	308.28
26	127	308.42	68	308	25.7	307.45	34	307.54	55.5	307.66	82.9	308.09
27	126	308.36	76.2	307.96	22.7	307.42	30	307.5	49.9	307.64	80	308.06
28	119	308.33	70	307.94	19.4	307.38	29	307.48	48.2	307.61	93.2	308.22
29	114	308.28	68.3	307.92			21	307.45	40	307.58	101	308.27
30	143	308.5	67.7	307.9			20	307.42	38	307.56	102	308.28
31	165	308.64	74.2	307.97			24.8	307.39			74.3	308.04
Ten-Daily Mean												
I Ten-Daily	37.55	307.54	23.99	307.38	27.62	307.45	72.65	307.91	37.55	307.54	23.99	307.38
II Ten-Daily	25.06	307.44	46.29	307.64	28.54	307.47	89.39	308.14	25.06	307.44	46.29	307.64
III Ten-Daily	32.62	307.5	34.65	307.55	38.46	307.52	95.14	308.22	32.62	307.5	34.65	307.55
Monthly												
Min.	17	307.35	19	307.35	17.2	307.34	58.9	307.71	17	307.35	19	307.35
Max.	66.7	307.8	61.5	307.78	55.5	307.67	108	308.32	66.7	307.8	61.5	307.78
Mean	31.74	307.49	34.98	307.52	31.54	307.48	85.73	308.09	31.74	307.49	34.98	307.52

Annual Runoff in MCM : 110.9

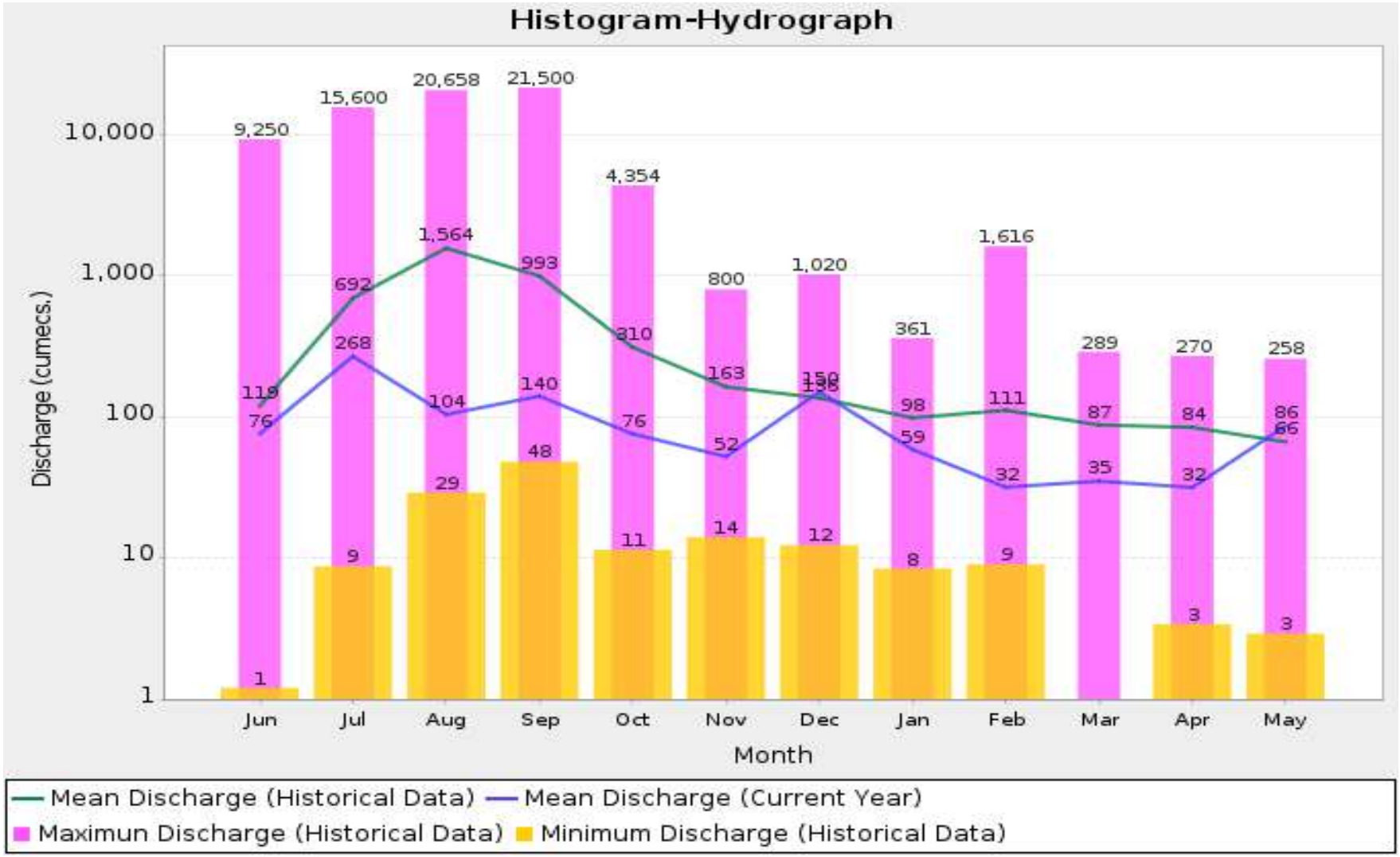
Peak Observed Discharge = 700 cumecs on 23/7/2017 Corres. Water Level 311.18 m

Lowest Observed Discharge = 17 cumecs on 8/2/2018 Corres. Water Level 307.35 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge #:Discarded Discharge (values changed as per rating curve)

Note:Missing values ignored while arriving at Annual Runoff

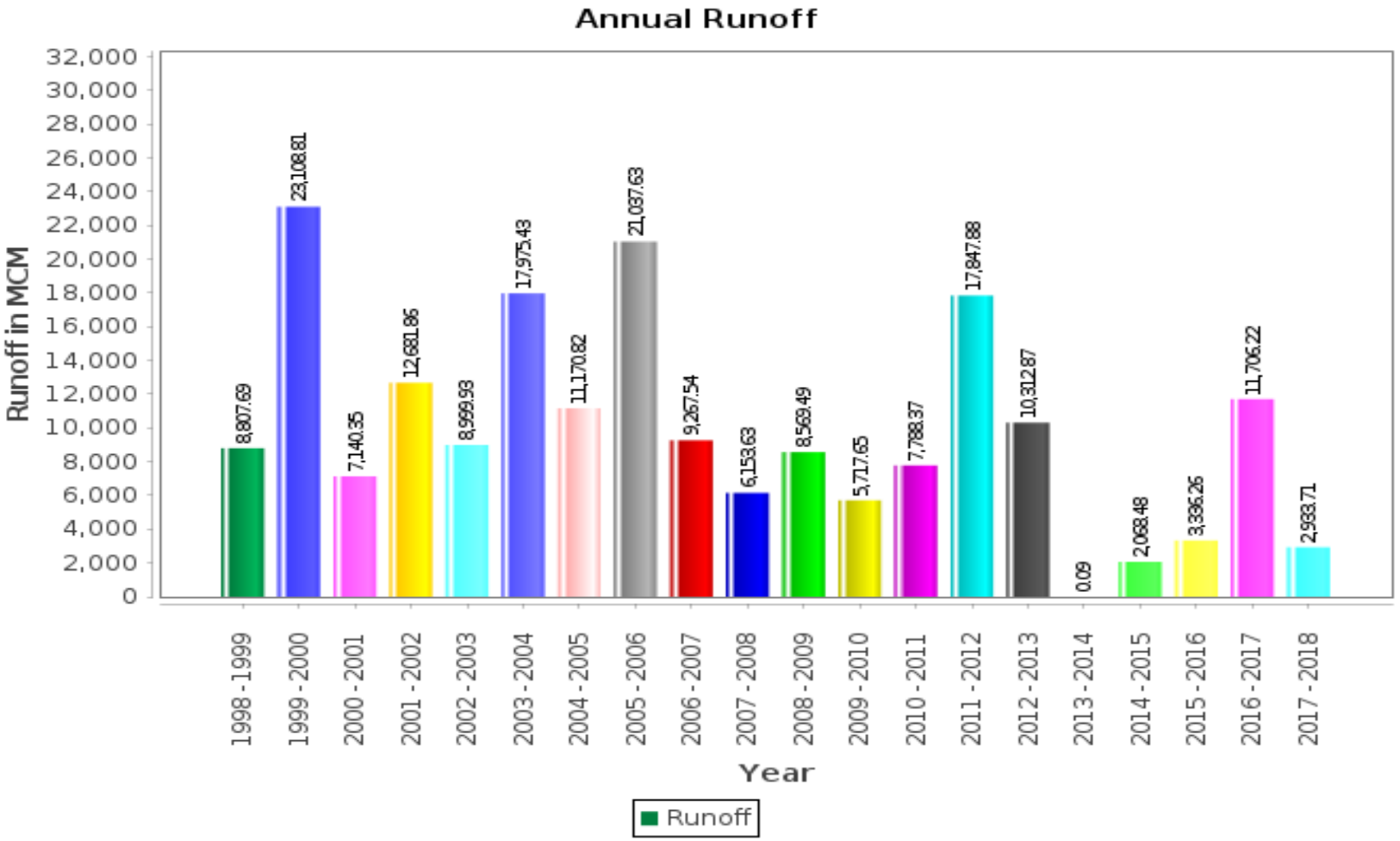
Histogram- Hydrograph for Water Year : 2017-18 (Data considered : 1972-2018)



Annual Runoff Values for the period (1972 – 2018)

Station Name : Narmada at Barmanghat (010215011) Division : Narmada Division, Bhopal

Local River : Narmada Sub-Division : MNSD I, CWC Hoshangabad

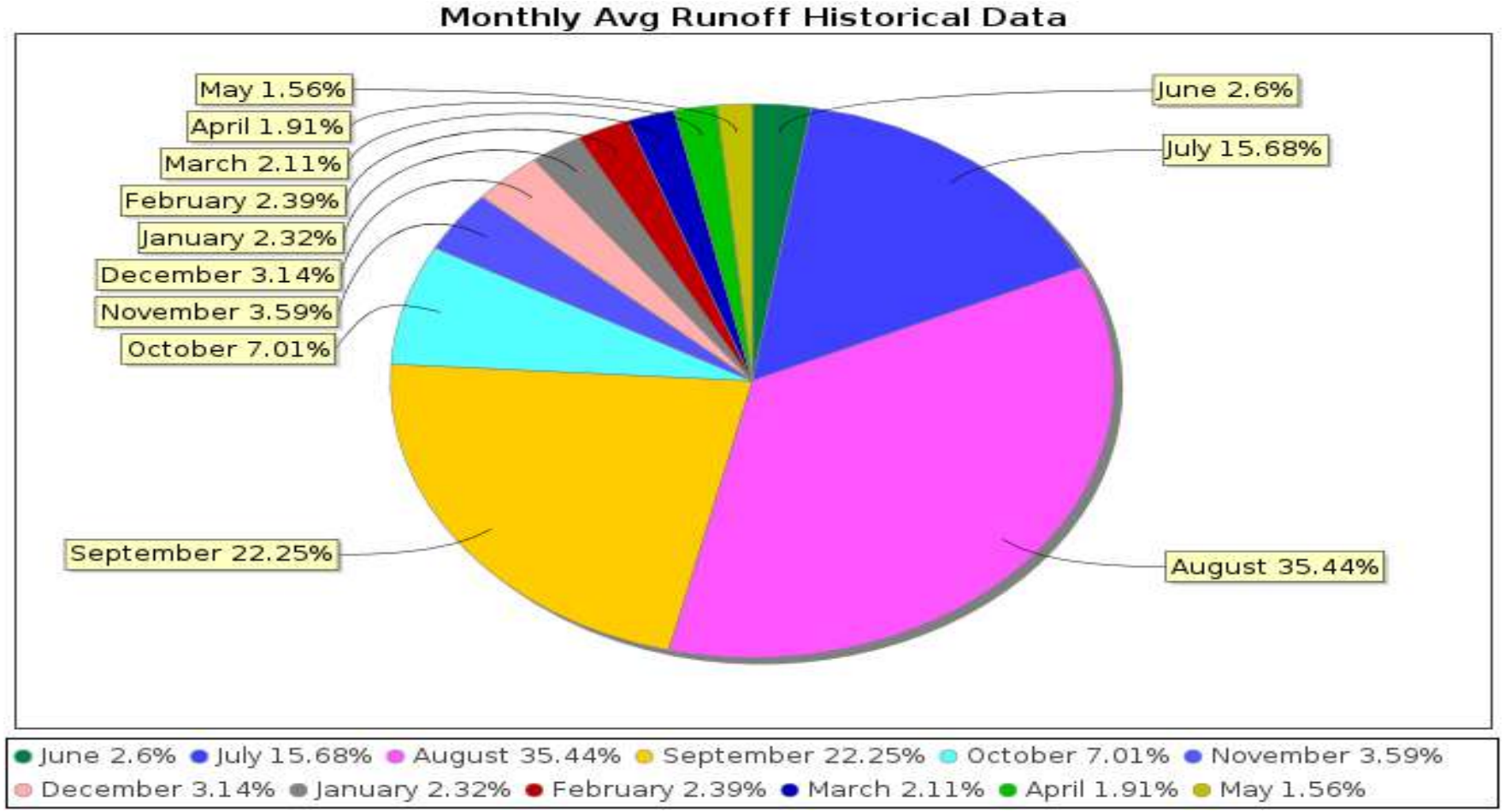


Note: Missing values have not been considered while arriving at Annual Runoff

Monthly Average Runoff based on period (1972 – 2018)

Station Name : Narmada at Barmanghat (010215011) Division : Narmada Division, Bhopal

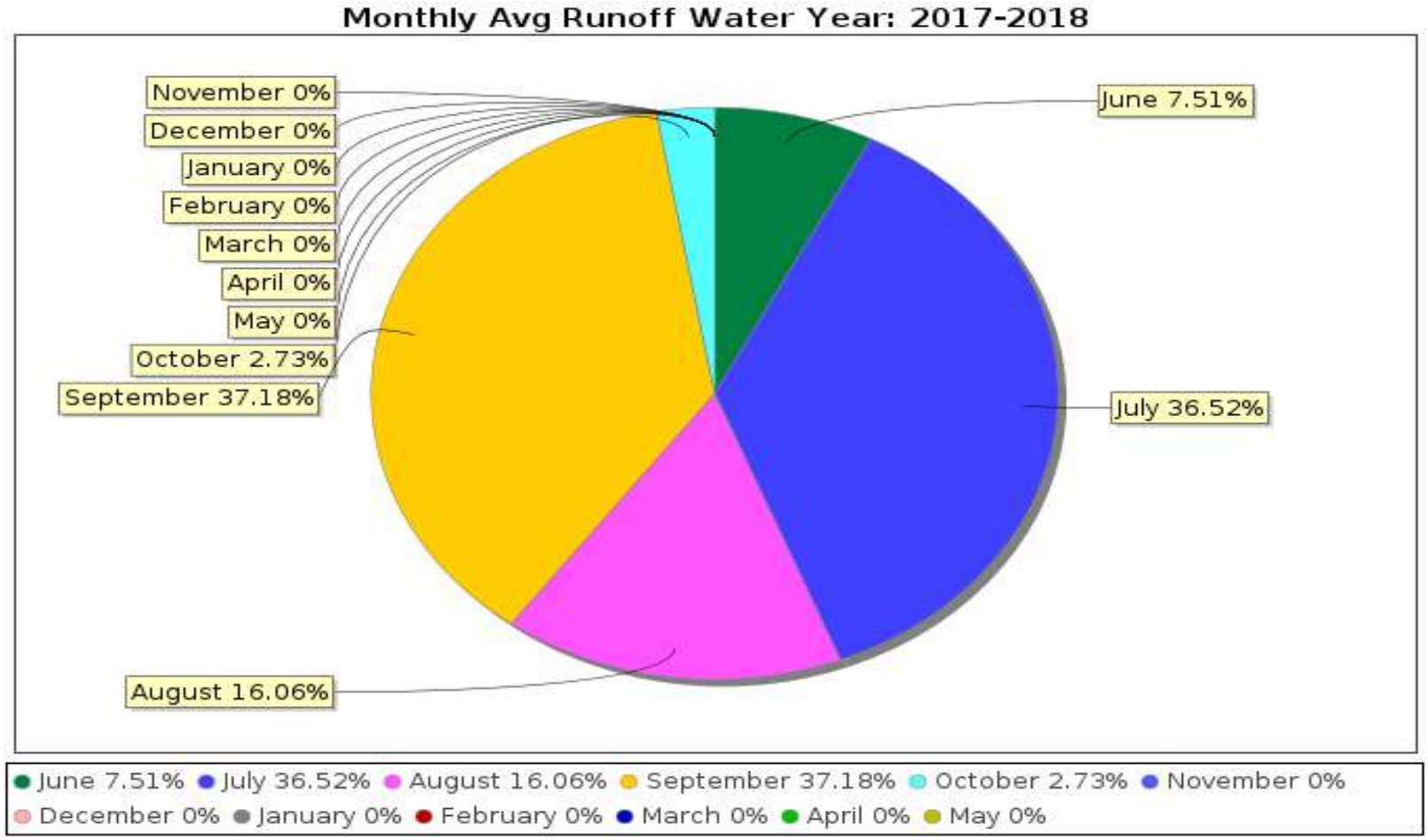
Local River : Narmada Sub-Division : MNSD I, CWC Hoshangabad



Monthly Runoff for the Year (2017-18)

Station Name : Narmada at Barmanghat (010215011) Division : Narmada Division, Bhopal

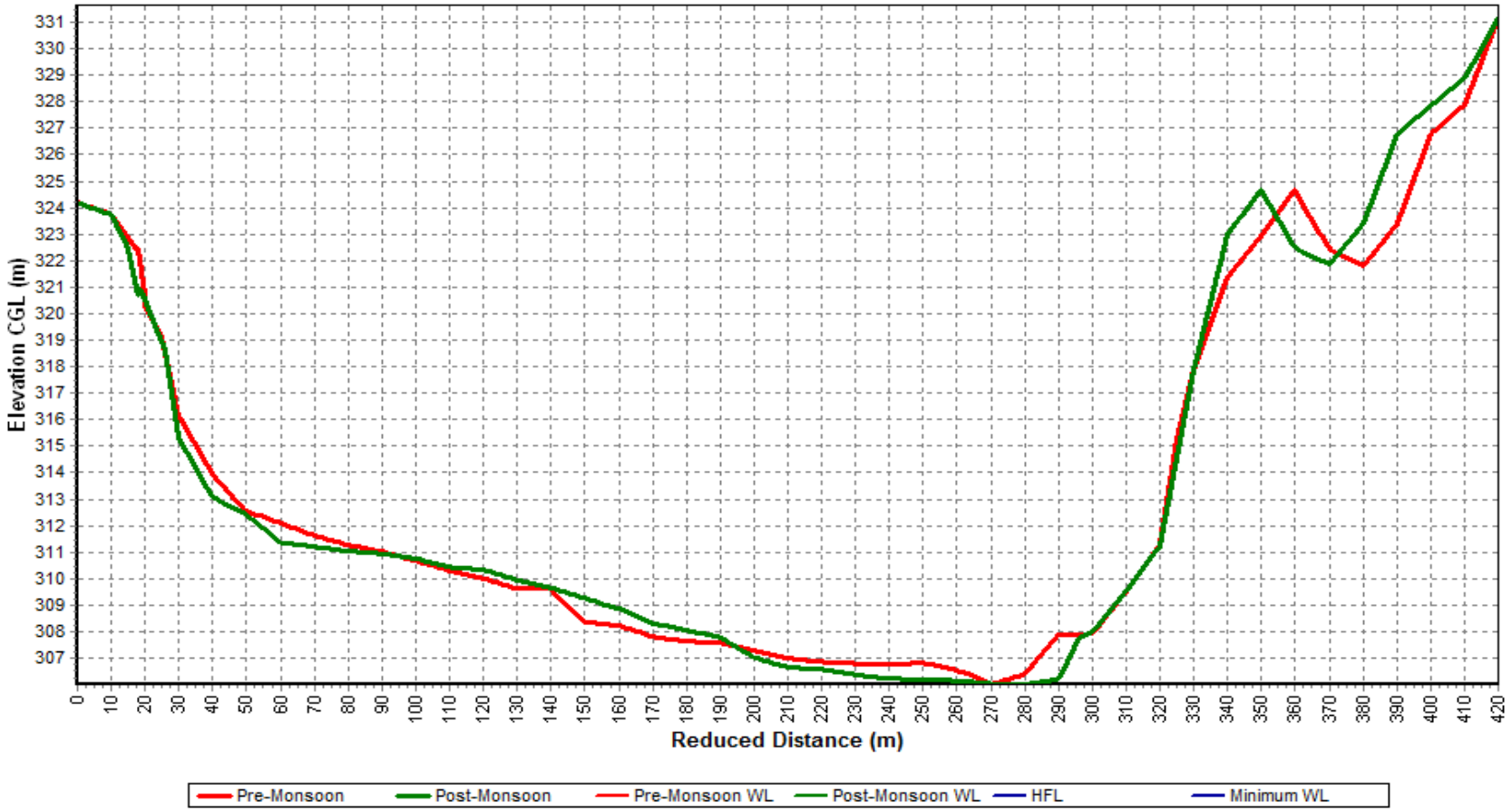
Local River : Narmada Sub-Division : MNSD I, CWC Hoshangabad



Pre-Monsoon & Post-Monsoon X-Section for Water Year (2017-18)

Station Name : Narmada at Barmanghat (010215011) Division : Narmada Division, Bhopal

Local River : Narmada Sub-Division : MNSD I, CWC Hoshangabad



4.11 Sher at Belkheri

History sheet

HISTORY SHEET (DISCHARGE AND WATER LEVEL)

			Water Year	:	2017 - 2018
Site	:	Belkhedi	**Code**	:	020-NDBHP
State	:	Madhya Pradesh	**District**	:	Jabalpur
Basin	:	NARMADA	**Independent River**	:	Narmada
Tributary	:	Sher	**Sub Tributary**	:	-
Sub-Sub Tributary	:	-	**Local River**	:	Sher
Division	:	Narmada Division(ND), Bhopal	**Sub-Division**	:	Middle Narmada Sub-Division-I, Hosangabad
Drainage Area	:	1508.0 Sq. Km.	**Bank**	:	Right
Latitude	:	22°55'40''	**Longitude**	:	79°20'22''
Current Zero of Gauge (m)	:	340			

CATEGORY		Opening Date	Closing Date
Gauge	:	16/03/1977	
Discharge	:	16/03/1977	
Sediment	:		
Water Quality	:		

Reduced Level	Opening Date	Closing Date
340.0	31/05/2014	-
340.0	16/03/1977	31/05/2013
340.0	01/02/1977	16/03/1977

Annual Maximum / Minimum discharge with corresponding Water Level (m.s.l)						
	Maximum			Minimum		
Year	Q (cumecs)	WL (m)	Date	Q (cumecs)	WL (m)	Date
1976-1977	0.7	341.3	16/03/1977	0.2	341.44	30/04/1977
1977-1978	1695	348.23	07/08/1977	0.1	341.435	08/06/1977
1978-1979	1280	346.435	15/08/1978	0.7	341.165	05/06/1978
1979-1980	2056.2	347.75	09/08/1979	0.4	341.28	15/05/1980
1980-1981	2712	349.1	29/08/1980	0.4	341.28	15/06/1980
1981-1982	645	345.15	22/09/1981	0.3	341.405	27/03/1982
1982-1983	2002.5	348.4	11/09/1982	0.3	341.565	25/04/1983
1983-1984	1700	348.2	08/09/1983	0.3	341.52	17/06/1983
1984-1985	6500	353.37	18/08/1984	0.4	341.02	05/05/1985
1985-1986	2150	348.65	17/08/1985	0.2	341.02	09/06/1985
1986-1987	1245	346.72	14/08/1986	0.02	341.01	21/06/1986
1987-1988	367	343.975	17/09/1987	0.32	341.22	29/05/1988
1988-1989	1200	347	04/08/1988	0.28	341.3	31/05/1989
1989-1990	1018	346.7	06/08/1989	0.25	341.3	03/06/1989
1990-1991	1300	347	30/08/1990	0.55	341.42	15/05/1991
1991-1992	1570	347.75	23/08/1991	0.41	341.32	20/05/1992
1992-1993	1560	347.5	20/08/1992	0.35	341.36	17/04/1993
1993-1994	2975	350.8	16/07/1993	0.26	341.09	18/05/1994
1994-1995	7600	359.95	21/07/1994	0.6	341.1	28/05/1995
1995-1996	864	345.8	20/07/1995	0.33	340.95	15/05/1996
1996-1997	323	343.8	29/08/1996	0.25	341.08	25/05/1997
1997-1998	2300	348.56	24/07/1997	0.25	341.085	09/06/1997
1998-1999	530	344.92	05/07/1998	0.12	341.08	13/04/1999
1999-2000	4475	353.94	15/09/1999	0.17	341.04	01/07/1999
2000-2001	1650	347.29	28/07/2000	0.31	340.94	10/04/2001
2001-2002	3900	352.92	19/07/2001	0.33	341	14/05/2002
2002-2003	2300	350.4	18/08/2002	0.24	340.91	27/04/2003
2003-2004	3700	352.78	14/09/2003	0	340.87	28/11/2003
2004-2005	1330	348.85	22/08/2004	0.18	340.96	04/06/2004
2005-2006	590.28	344.98	15/09/2005	0.11	341	12/06/2005
2006-2007	4803.16	351.2	22/07/2006	0.09	341.02	25/06/2006
2007-2008	1076.94	345.3	08/07/2007	0.1	341.05	10/06/2007
2008-2009	232.92	343.48	01/08/2008	0.13	341.05	03/06/2008
2009-2010	454.37	344.45	09/09/2009	0.05	340.94	30/05/2010
2010-2011	411.7	344.05	19/09/2010	0.11	340.94	06/06/2010

2011-2012	431.08	344.36	16/07/2011	0.04	340.89	12/06/2011
2012-2013	1224.06	346.15	06/08/2012	0.08	341.02	13/06/2012
2013-2014	702.87	345.1	22/08/2013	0.34	341.05	03/06/2013
2014-2015	415.62	344.4	06/08/2014	0.34	341.38	12/05/2015
2015-2016	451.45	344.41	04/08/2015	0.24	341.04	14/05/2016
2016-2017	425	344.475	12/07/2016	0.02	341.1	02/12/2016
2017-2018	239.5	343.17	24/07/2017	0	341.1	19/02/2018

Stage Discharge Sheet for Sher at Belkheri for the period 2017-18

Day	June		July		August		September		October		November	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	0.36	341.02	82.76	342.29	16.67	341.65	87.37	342.4	7.5	341.5	0	341.1
2	0.4	341.03	48.5	343.1	13.69	341.61	92	342.83	6	341.45	0	341.1
3	0.4	341.03	49.27	342.09	13.15	341.57	43.5	341.98	9.4	341.4	0	341.1
4	0.35	341.02	48.75	342.1	12.05	341.52	24.69	341.82	5.37	341.35	0	341.1
5	0.35	341.02	28.37	341.88	8.63	341.45	18.13	341.7	5.04	341.32	0	341.1
6	0.4	341.03	13.85	341.59	6	341.38	14.41	341.58	4.38	341.28	0	341.1
7	0.4	341.03	6.89	341.41	5.06	341.31	9.71	341.45	4.03	341.25	0	341.09
8	0.39	341.03	6.33	341.28	4.7	341.26	18.68	342.74	3	341.23	0	341.09
9	0.38	341.02	3.1	341.24	28.83	341.85	14.2	342.62	3.74	341.2	0	341.09
10	0.39	341.02	6.26	341.22	18.5	341.7	7.6	342.5	3.74	341.2	0	341.09
11	0.35	341.02	5.72	341.2	10.55	341.48	46.01	342.98	3.72	341.2	0	341.09
12	0.36	341.02	9.43	341.34	8.32	341.43	222.5	343.27	3.6	341.2	0	341.09
13	0.34	341.02	10.41	341.4	5	341.39	62.88	342.28	3.35	341.19	0	341.09
14	0.38	341.02	6.55	341.27	9.3	341.37	69.42	342.39	3.32	341.19	0	341.1
15	0.36	341.02	10.06	341.37	4.5	341.32	48.75	342.1	4.5	341.38	0	341.1
16	0.37	341.02	4.2	341.29	7.39	341.27	31.32	341.86	5.26	341.34	0	341.1
17	0.36	341.02	6.55	341.25	6.67	341.24	38.5	341.97	4.64	341.28	0	341.11
18	0.35	341.02	9.8	341.35	6.05	341.21	24.17	341.82	3.75	341.23	0	341.11
19	0.37	341.02	78.82	342.3	7.88	341.4	59.26	342.22	3	341.21	0	341.11
20	0.37	341.02	216.6	343.4	8	341.51	49.33	342.1	2.3	341.2	0	341.11
21	0.37	341.02	40.73	344.48	9.59	341.45	47.08	342.07	2.90	341.17	0	341.11
22	0.35	341.02	124.8	342.67	9.33	341.38	149.9	342.7	2.95	341.14	0	341.11
23	0.36	341.02	78	342.28	5.36	341.33	66.06	342.32	3.35	341.14	0	341.11
24	0.38	341.02	239.5	343.17	4.97	341.3	49.5	342.15	3.69	341.12	0	341.11
25	0.38	341.02	87.68	342.35	4.52	341.25	42.49	341.95	3.25	341.11	0	341.12
26	0.35	341.02	47.74	342.05	139.7	341.58	30	341.86	3.20	341.12	0	341.12
27	0.35	341.03	41.04	341.95	100	342.52	22.56	341.8	3.13	341.11	0	341.12
28	35	341.92	31.7	341.93	40.84	341.99	20.2	341.7	2.69	341.11	0	341.12
29	8.83	341.46	23.98	341.87	17.33	341.68	13.69	341.6	1.37	341.11	0	341.12
30	236.2	343.38	24.14	341.8	18.43	341.7	11.7	341.54	2.42	341.11	0	341.12
31			18.41	341.74	68.92	341.17			2.32	341.11		
Ten-Daily Mean												
I Ten-Daily	0.38	341.02	29.41	341.82	12.73	341.53	33.03	342.16	5.22	341.32	0	341.1
II Ten-Daily	0.36	341.02	35.81	341.62	7.37	341.36	65.21	342.3	3.74	341.24	0	341.1
III Ten-Daily	28.26	341.39	68.88	342.39	38.09	341.58	45.32	341.97	1.42	341.12	0	341.12
Monthly												
Min.	0.34	341.02	3.1	341.2	4.5	341.17	7.6	341.45	1.37	341.11	0	341.09
Max.	236.2	343.38	239.5	344.48	139.7	342.52	222.5	343.27	9.4	341.5	0	341.12
Mean	9.67	341.14	44.7	341.94	19.4	341.49	47.85	342.14	3.46	341.23	0	341.1

Annual Runoff in MCM : 333.57

Peak Observed Discharge = 239.5 cumecs on 24/7/2017 Corres. Water Level 343.17 m

Lowest Observed Discharge = 0cumecs on 19/2/2018 Corres. Water Level 341.1 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge

#:Discarded Discharge (values changed as per rating curve)

Stage Discharge Sheet for Sher at Belkheri for the period 2017-18

Day	December		January		February		March		April		May	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	0	341.12	0	341.11	x	341.09	0	341.07	0	341.08	0	341.1
2	0	341.12	0	341.11	0	341.09	0	341.07	0	341.08	0	341.1
3	0	341.12	0	341.11	0	341.09	0	341.07	0	341.09	0	341.1
4	0	341.12	0	341.11	0	341.09	0	341.06	0	341.09	0	341.11
5	0	341.12	0	341.11	0	341.09	0	341.06	0	341.09	0	341.11
6	0	341.12	0	341.11	0	341.09	0	341.06	0	341.09	0	341.11
7	0	341.12	0	341.11	0	341.09	0	341.06	0	341.09	0	341.11
8	0	341.12	0	341.11	0	341.08	0	341.06	0	341.1	0	341.11
9	0	341.12	0	341.11	0	341.08	0	341.06	0	341.1	0	341.12
10	0	341.12	0	341.11	0	341.08	0	341.06	0	341.1	0	341.12
11	0	341.12	0	341.11	0	341.08	0	341.06	0	341.1	0	341.12
12	0	341.12	0	341.11	0	341.09	0	341.06	0	341.1	0	341.12
13	0	341.12	0	341.11	0	341.09	0	341.06	0	341.1	0	341.11
14	0	341.11	0	341.11	0	341.09	0	341.06	0	341.11	0	341.11
15	0	341.11	0	341.1	0	341.09	0	341.06	0	341.11	0	341.11
16	0	341.11	0	341.1	0	341.1	0	341.07	0	341.11	0	341.11
17	0	341.11	0	341.1	0	341.1	0	341.07	0	341.11	0	341.1
18	0	341.11	0	341.1	0	341.1	0	341.07	0	341.11	0	341.1
19	0	341.11	0	341.1	0	341.1	0	341.07	0	341.1	0	341.1
20	0	341.11	0	341.1	0	341.09	0	341.07	0	341.1	0	341.1
21	0	341.11	0	341.1	0	341.09	0	341.07	0	341.1	0	341.1
22	0	341.11	0	341.1	0	341.09	0	341.07	0	341.1	0	341.1
23	0	341.11	0	341.1	0	341.08	0	341.07	0	341.1	0	341.1
24	0	341.11	0	341.1	0	341.08	0	341.07	0	341.1	0	341.11
25	0	341.11	0	341.1	0	341.08	0	341.08	0	341.1	0	341.11
26	0	341.11	0	341.1	0	341.08	0	341.08	0	341.09	0	341.11
27	0	341.11	0	341.1	0	341.07	0	341.08	0	341.09	0	341.11
28	0	341.11	0	341.1	0	341.07	0	341.08	0	341.09	0	341.11
29	0	341.11	0	341.1			0	341.08	0	341.1	0	341.11
30	0	341.11	0	341.09			0	341.08	0	341.1	0	341.11
31	0	341.11	0	341.09			0	341.08			0	341.11
Ten-Daily Mean												
I Ten-Daily	0	341.12	0	341.11	0	341.09	0	341.06	0	341.09	0	341.11
II Ten-Daily	0	341.11	0	341.1	0	341.09	0	341.07	0	341.1	0	341.11
III Ten-Daily	0	341.11	0	341.1	0	341.08	0	341.08	0	341.1	0	341.11
Monthly												
Min.	0	341.11	0	341.09	0	341.07	0	341.06	0	341.08	0	341.1
Max.	0	341.12	0	341.11	0	341.1	0	341.08	0	341.11	0	341.12
Mean	0	341.12	0	341.1	0	341.09	0	341.07	0	341.1	0	341.11

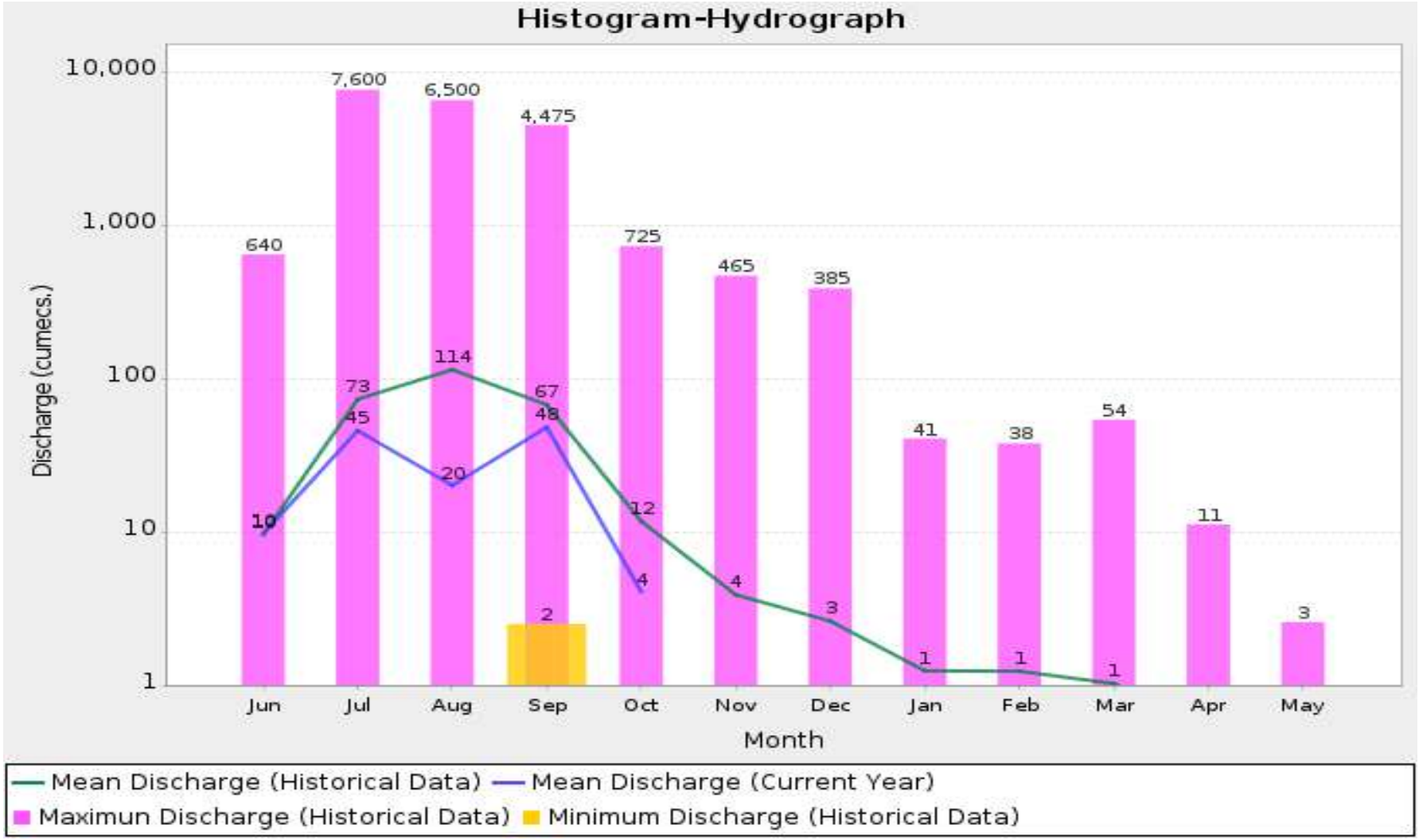
Annual Runoff in mm : 221.2

Peak Computed Discharge = 100 cumecs on 27/8/2017 Corres. Water Level 342.52 m

Lowest Computed Discharge = 0.35cumecs on 26/6/2017 Corres. Water Level 341.02 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge
#:Discarded Discharge (values changed as per rating curve)
Note:Missing values ignored while arriving at Annual Runoff

Histogram- Hydrograph for Water Year : 2017-18 (Data considered : 1977-2018)



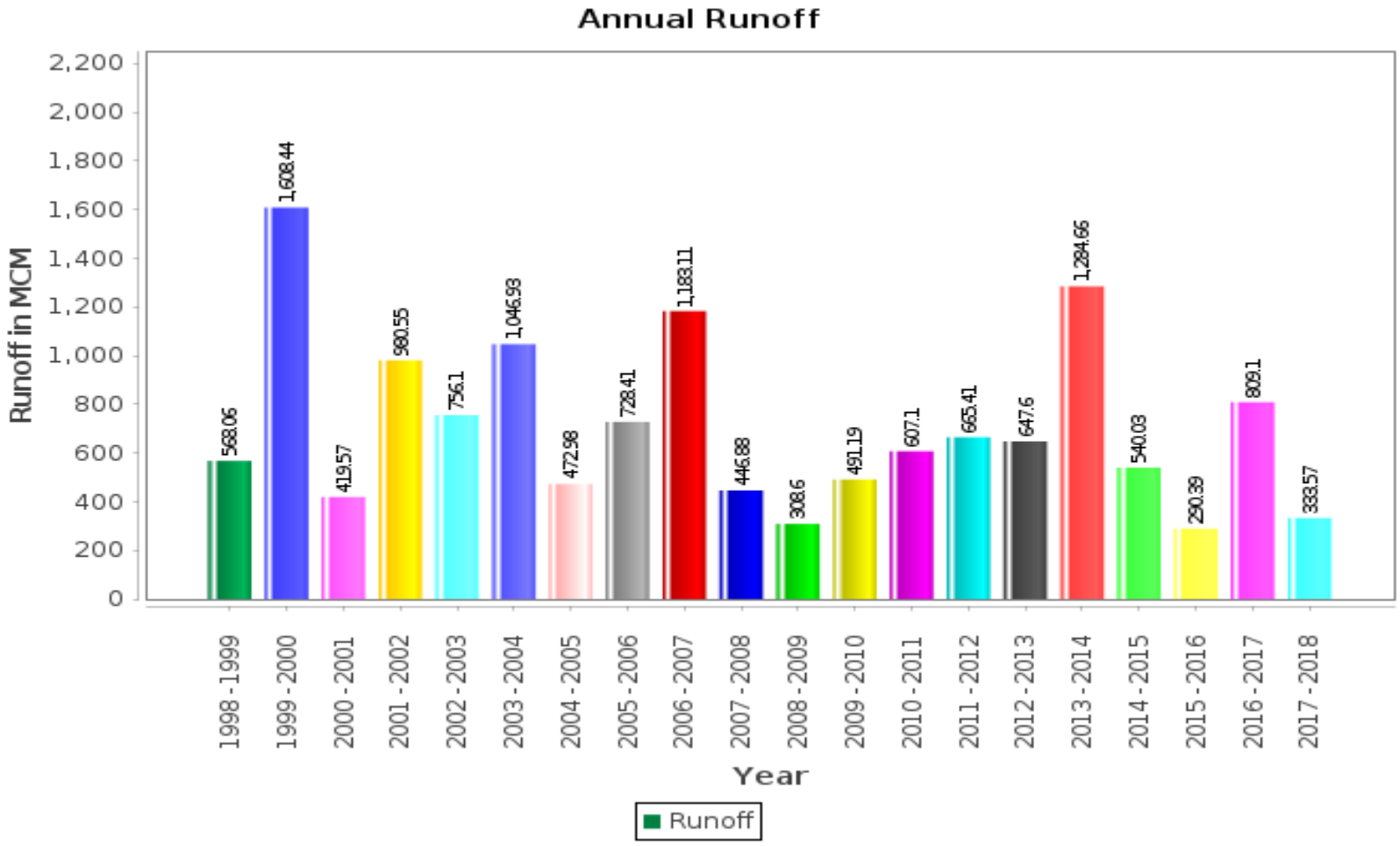
Annual Runoff Values for the period (1977 – 2018)

Station Name : Sher at Belkheri (010215010)

Division : Narmada Division, Bhopal

Local River : Sher

Sub-Division : MNSD I, CWC Hoshangabad



Note: Missing values have not been considered while arriving at Annual Runoff

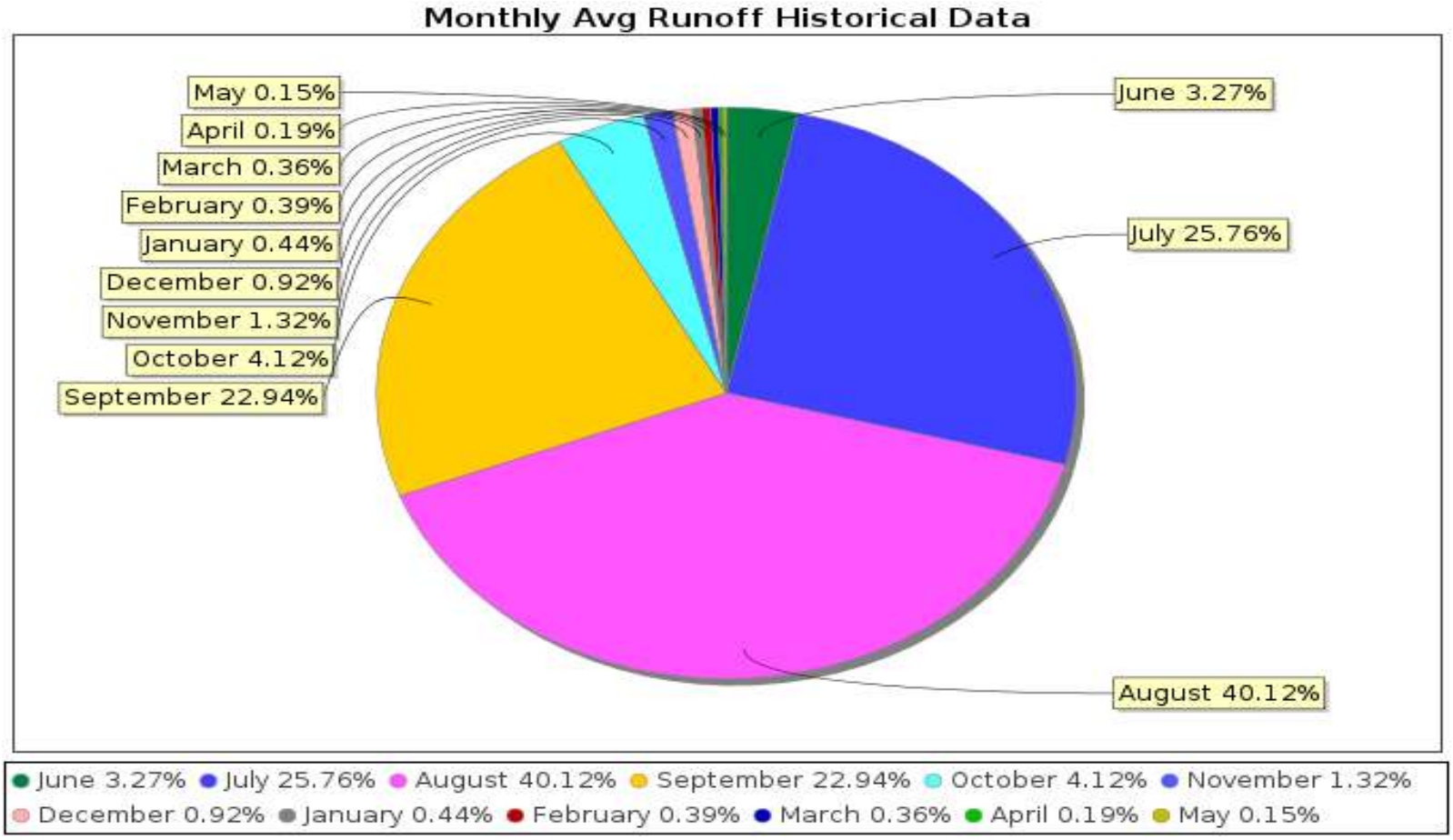
Monthly Average Runoff based on period (1977-2018)

Station Name : Sher at Belkheri (010215010)

Division : Narmada Division, Bhopal

Local River : Sher

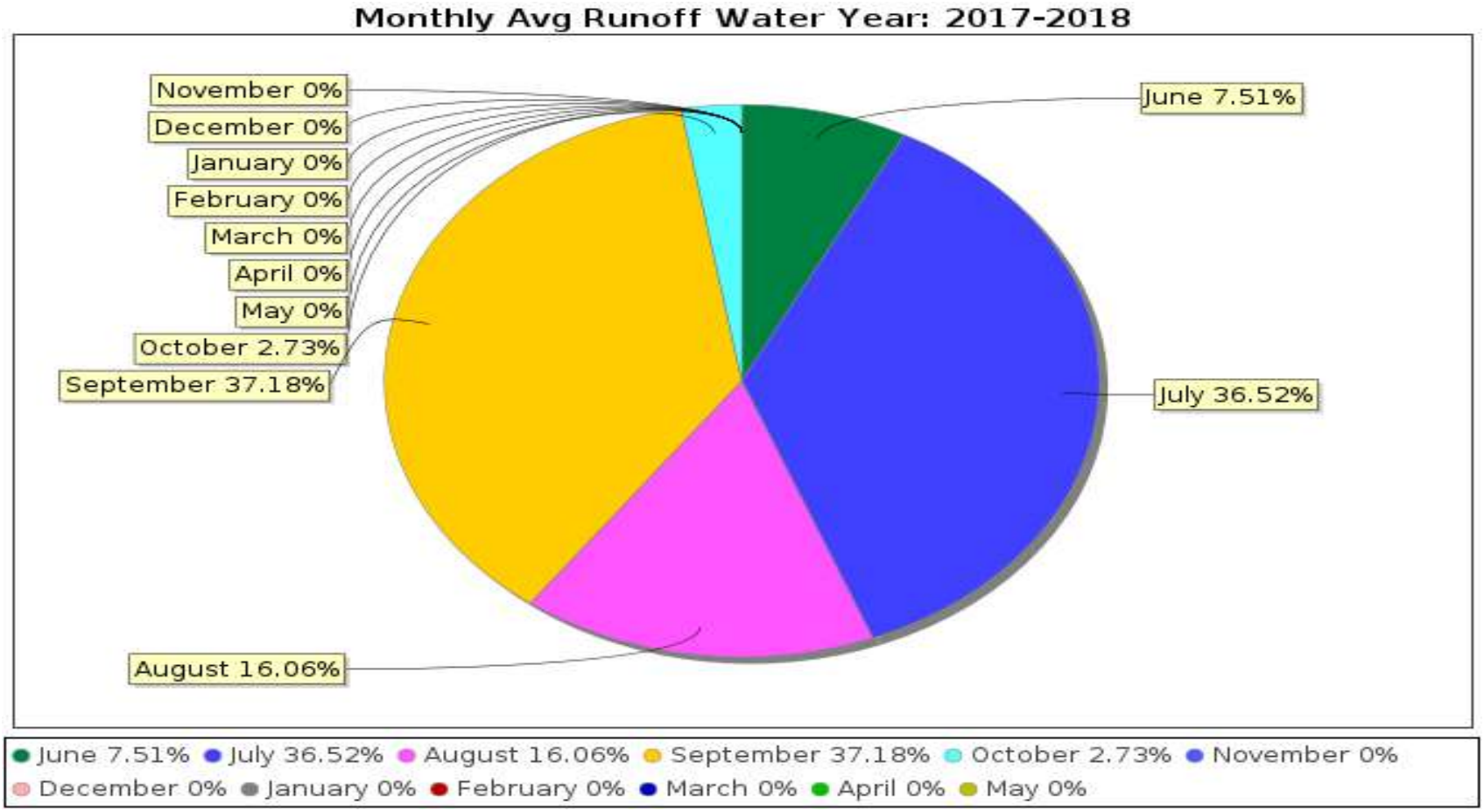
Sub-Division : MNSD I, CWC Hoshangabad



Monthly Runoff for the Year (2017-18)

Station Name : Sher at Belkheri (010215010) Division : Narmada Division, Bhopal

Local River : Sher Sub-Division : MNSD I, CWC Hoshangabad



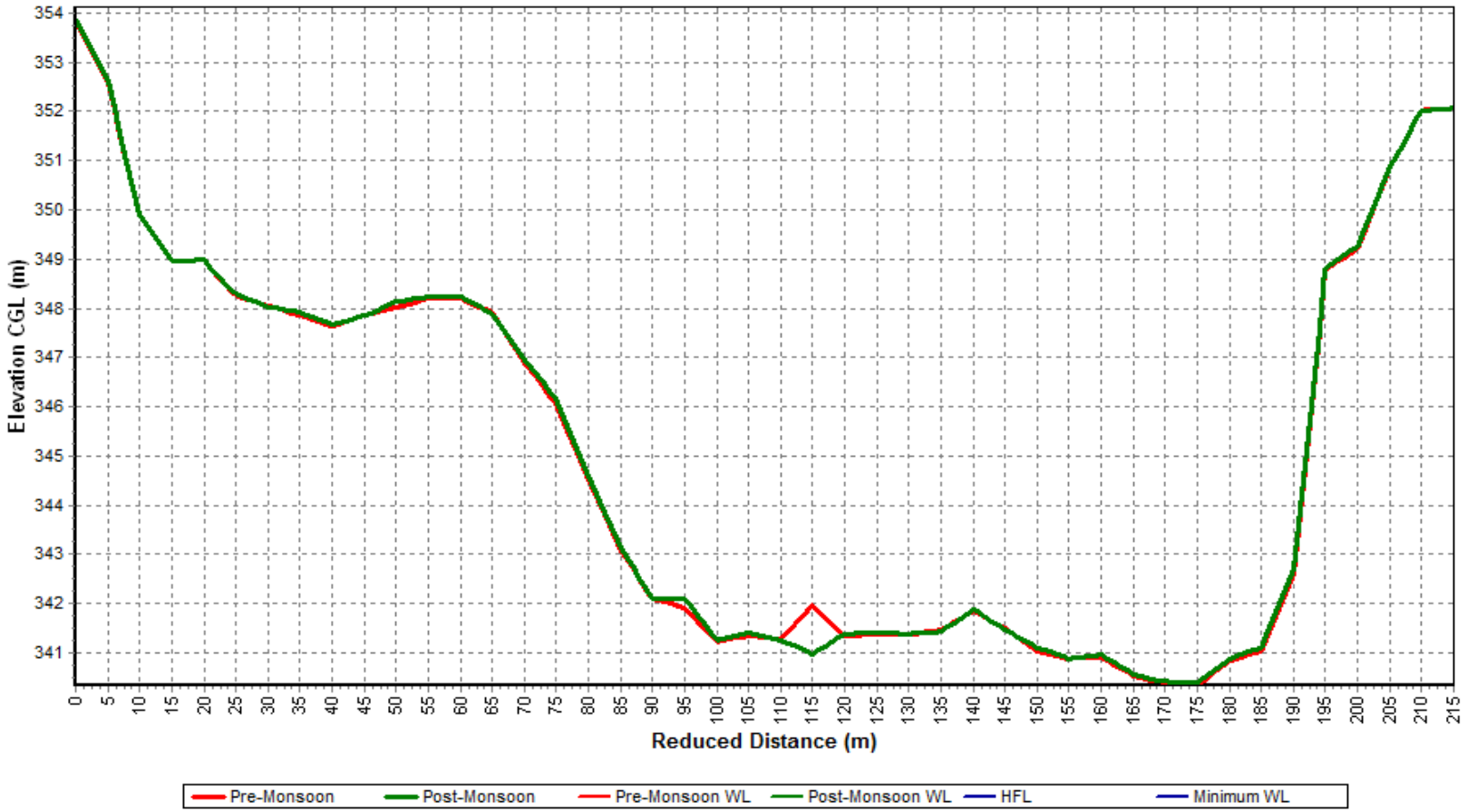
Pre-Monsoon & Post-Monsoon X-Section for Water Year (2017-18)

Station Name : Sher at Belkheri (010215010)

Division : Narmada Division, Bhopal

Local River : Sher

Sub-Division : MNSD I, CWC Hoshangabad



4.12 Hiran at Patan

History sheet

HISTORY SHEET (DISCHARGE AND WATER LEVEL)

			Water Year	:	2017 - 2018
Site	:	Patan	**Code**	:	006-NDBHP
State	:	Madhya Pradesh	**District**	:	Jabalpur
Basin	:	NARMADA	**Independent River**	:	Narmada
Tributary	:	Heran	**Sub Tributary**	:	-
Sub-Sub Tributary	:	-	**Local River**	:	Heran
Division	:	Narmada Division(ND), Bhopal	**Sub-Division**	:	Upper Narmada Sub-Division, Jabalpur
Drainage Area	:	3950.0 Sq. Km.	**Bank**	:	Left
Latitude	:	23°18'42''	**Longitude**	:	79°39'45''
Current Zero of Gauge (m)	:	341.5			

CATEGORY		Opening Date	Closing Date
Gauge	:	30/08/1979	
Discharge	:	30/08/1979	
Sediment	:		
Water Quality	:		

Reduced Level	Opening Date	Closing Date
341.5	30/08/1979	31/12/2020
341.5	14/10/2016	-

Annual Maximum / Minimum discharge with corresponding Water Level (m.s.l)

	Maximum			Minimum		
Year	Q (cumecs)	WL (m)	Date	Q (cumecs)	WL (m)	Date
1979-1980	12.2	342.355	01/12/1979	0	0	01/06/1979
1980-1981	1666	355.66	30/08/1980	0.4	341.855	01/06/1980
1981-1982	202	346.19	08/08/1981	0.8	341.84	14/06/1981
1982-1983	1981	354.313	10/08/1982	1.3	342.07	30/05/1983
1983-1984	1640	355.67	10/09/1983	1.2	342.54	06/06/1983
1984-1985	1275	352.85	24/08/1984	1.3	342.34	31/05/1985
1985-1986	1118	351.35	09/08/1985	1.3	342.34	01/06/1985
1986-1987	440	347.44	06/08/1986	1.6	342.29	20/05/1987
1987-1988	1200	352.37	17/09/1987	1.06	342.32	01/07/1987
1988-1989	1200	352.35	05/08/1988	1.29	342.31	31/05/1989
1989-1990	310	346.4	15/08/1989	0.37	342.795	14/05/1990
1990-1991	1270	351.27	20/09/1990	1.64	342.93	01/06/1990
1991-1992	1680	354.95	25/08/1991	1.6	342.36	06/06/1991
1992-1993	1880	356.08	13/09/1992	1.29	342.485	29/06/1992
1993-1994	1086	351.6	10/09/1993	1.5	342.25	11/06/1993
1994-1995	1660	354.7	02/08/1994	2.32	342.17	31/05/1995
1995-1996	1415	353.605	11/08/1995	1.05	342.25	31/05/1996
1996-1997	234	345.62	18/08/1996	0	342.05	20/03/1997
1997-1998	1295	351.85	07/08/1997	0	341.925	01/06/1997
1998-1999	488	347.65	07/08/1998	0.73	342.21	19/05/1999
1999-2000	1620	353.23	09/08/1999	0.9	342.19	15/06/1999
2000-2001	756	349.6	20/07/2000	0.05	341.8	19/05/2001
2001-2002	580	347.75	27/07/2001	0.25	341.8	01/06/2001
2002-2003	1302	352.5	19/08/2002	1.07	342.2	03/06/2002
2003-2004	1360	352.62	16/09/2003	0.56	342.16	11/06/2003
2004-2005	1175	352.25	23/08/2004	1.24	342.06	31/05/2005
2005-2006	1930	356.8	06/07/2005	0.39	341.97	26/06/2005
2006-2007	254.94	347.05	25/08/2006	0.15	341.7	31/05/2007
2007-2008	663.16	348.61	22/08/2007	0	0	11/04/2008
2008-2009	945.33	350.3	08/07/2008	0.59	341.65	29/05/2009
2009-2010	937.53	350.65	11/09/2009	0.06	341.72	21/05/2010
2010-2011	866.13	350.025	26/07/2010	0	341.71	01/07/2010
2011-2012	1444.59	352.51	24/07/2011	0	341.77	01/06/2011
2012-2013	531.3	347.72	11/08/2012	0	0	16/05/2013
2013-2014	2202.29	355.14	20/08/2013	0	0	02/06/2013
2014-2015	779.82	349.2	06/08/2014	0.5	341.51	20/05/2015
2015-2016	380.45	347.18	04/08/2015	0.06	341.51	11/04/2016

2016-2017	872.73	349.74	20/08/2016	1.05	341.54	07/04/2017
2017-2018	144	344.55	23/07/2017	0	341.5	04/06/2017

Stage Discharge Sheet for Hiran at Patan for the period 2017-18

Day	June		July		August		September		October		November	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	0	341.5	17.49	342.31	26.95	342.68	39.67	342.82	29.15	342.57	5	341.64
2	0	341.5	2.4	341.62	23.07	342.4	25.5	342.65	27	342.5	4.5	341.62
3	0	341.5	3.93	341.67	17.17	342.22	24.25	342.49	28.48	342.52	3.9	341.58
4	0	341.5	2.68	341.6	16.15	342.07	23.47	342.33	27.58	342.5	2.2	341.56
5	0	341.5	2.63	341.6	13.46	341.99	22.97	342.3	35.63	342.61	2	341.55
6	0	341.5	2.66	341.6	10.25	341.94	22.31	342.28	31.73	342.57	1.6	341.53
7	0	341.5	2.66	341.6	22.97	342.3	16.57	342.1	27.88	342.51	1.5	341.52
8	0	341.5	2.54	341.59	38.55	342.77	14.61	342.06	29	342.56	1	341.51
9	0	341.5	2.53	341.59	57.54	343.16	15.31	342.07	28.63	342.54	1	341.51
10	0	341.5	2.96	341.62	52.19	343.11	16.9	342.12	33.57	342.61	1	341.51
11	0	341.5	2.89	341.61	40.28	342.83	17.94	347.17	36.9	342.69	0	341.5
12	0	341.5	2.69	341.6	27.93	342.51	22.35	342.28	35.46	342.66	0	341.5
13	0	341.5	8.66	341.95	23	342.32	18.14	342.18	33.07	342.6	0	341.5
14	0	341.5	27.29	342.69	16.44	342.17	17.96	342.17	27.53	342.5	0	341.5
15	0	341.5	22.73	342.52	15.3	342.05	28.63	342.42	26.98	342.48	0	341.5
16	0	341.5	26	342.66	13.36	341.98	23.61	342.33	26.4	342.45	0	341.5
17	0	341.5	16.96	342.21	13.03	341.92	19.4	342.23	28.57	342.52	0	341.5
18	0	341.5	26.4	342.52	13.14	341.93	23.71	342.33	32.48	342.59	0	341.5
19	0	341.5	89.01	343.68	13.24	341.94	44.57	342.88	27.5	342.5	0	341.5
20	0	341.5	50.13	343.12	13	341.92	48.66	342.96	25.2	342.41	0	341.5
21	0	341.5	64.46	343.35	11.98	341.86	84.97	343.56	23.9	342.35	0	341.5
22	0	341.5	140.1	344.29	11.54	341.83	110.7	344.05	22	342.28	0	341.5
23	0	341.5	144	344.55	10	341.8	122.8	344.13	21.49	342.26	0	341.5
24	0	341.5	102.1	343.99	11.87	341.85	99.5	343.72	23.73	342.33	0	341.5
25	0	341.5	67.07	343.44	64.91	343.36	79.5	343.43	22.11	342.28	0	341.5
26	0	341.5	55.02	343.14	66.02	343.4	59.36	343.23	16.1	342.09	0	341.5
27	0	341.5	30.82	342.56	49.8	343.05	54.63	343.13	13.41	341.95	0	341.5
28	0	341.5	109	343.85	61.49	343.28	48.73	342.96	11.89	341.85	0	341.5
29	0	341.5	97.37	343.68	55.03	343.14	38.58	342.77	10	341.8	0	341.5
30	8.94	341.95	72	343.47	57.47	343.16	34.3	342.62	7.64	341.71	0	341.5
31			49.02	342.99	51	343.06			6.68	341.68		
Ten-Daily Mean												
I Ten-Daily	0	341.5	4.25	341.68	27.83	342.46	22.16	342.32	29.86	342.55	2.37	341.55
II Ten-Daily	0	341.5	27.28	342.46	18.87	342.16	26.5	342.9	30.01	342.54	0	341.5
III Ten-Daily	0.89	341.55	84.63	343.57	41.01	342.71	73.31	343.36	16.27	342.05	0	341.5
Monthly												
Min.	0	341.5	2.4	341.59	10	341.8	14.61	342.06	6.68	341.68	0	341.5
Max.	8.94	341.95	144	344.55	66.02	343.4	122.8	347.17	36.9	342.69	5	341.64
Mean	0.3	341.52	38.72	342.57	29.24	342.44	40.65	342.86	25.38	342.38	0.79	341.52

Annual Runoff in MCM : 362.38

Peak Observed Discharge = 140.1 cumecs on 22/7/2017 Corres. Water Level 344.29 m

Lowest Observed Discharge = 0cumecs on 4/6/2017 Corres. Water Level 341.5 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(m.s.l) in m *:Computed Discharge
#:Discarded Discharge (values changed as per rating curve)
Note:Missing values ignored while arriving at Annual Runoff

Stage Discharge Sheet for Hiran at Patan for the period 2017-18

Day	December		January		February		March		April		May	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5
2	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5
3	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5
4	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5
5	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5
6	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5
7	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5
8	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5
9	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5
10	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5
11	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5
12	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5
13	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5
14	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5
15	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5
16	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5
17	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5
18	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5
19	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5
20	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5
21	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5
22	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5
23	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5
24	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5
25	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5
26	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5
27	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5
28	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5
29	0	341.5	0	341.5			0	341.5	0	341.5	0	341.5
30	0	341.5	0	341.5			0	341.5	0	341.5	0	341.5
31	0	341.5	0	341.5			0	341.5			0	341.5
Ten-Daily Mean												
I Ten-Daily	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5
II Ten-Daily	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5
III Ten-Daily	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5
Monthly												
Min.	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5
Max.	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5
Mean	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5	0	341.5

Annual Runoff in mm : **91.74**

Peak Computed Discharge = 144 cumecs on 23/7/2017 **Corres. Water Level 344.55 m**

Lowest Computed Discharge = 1cumecs on 8/11/2017 **Corres. Water Level 341.51 m**

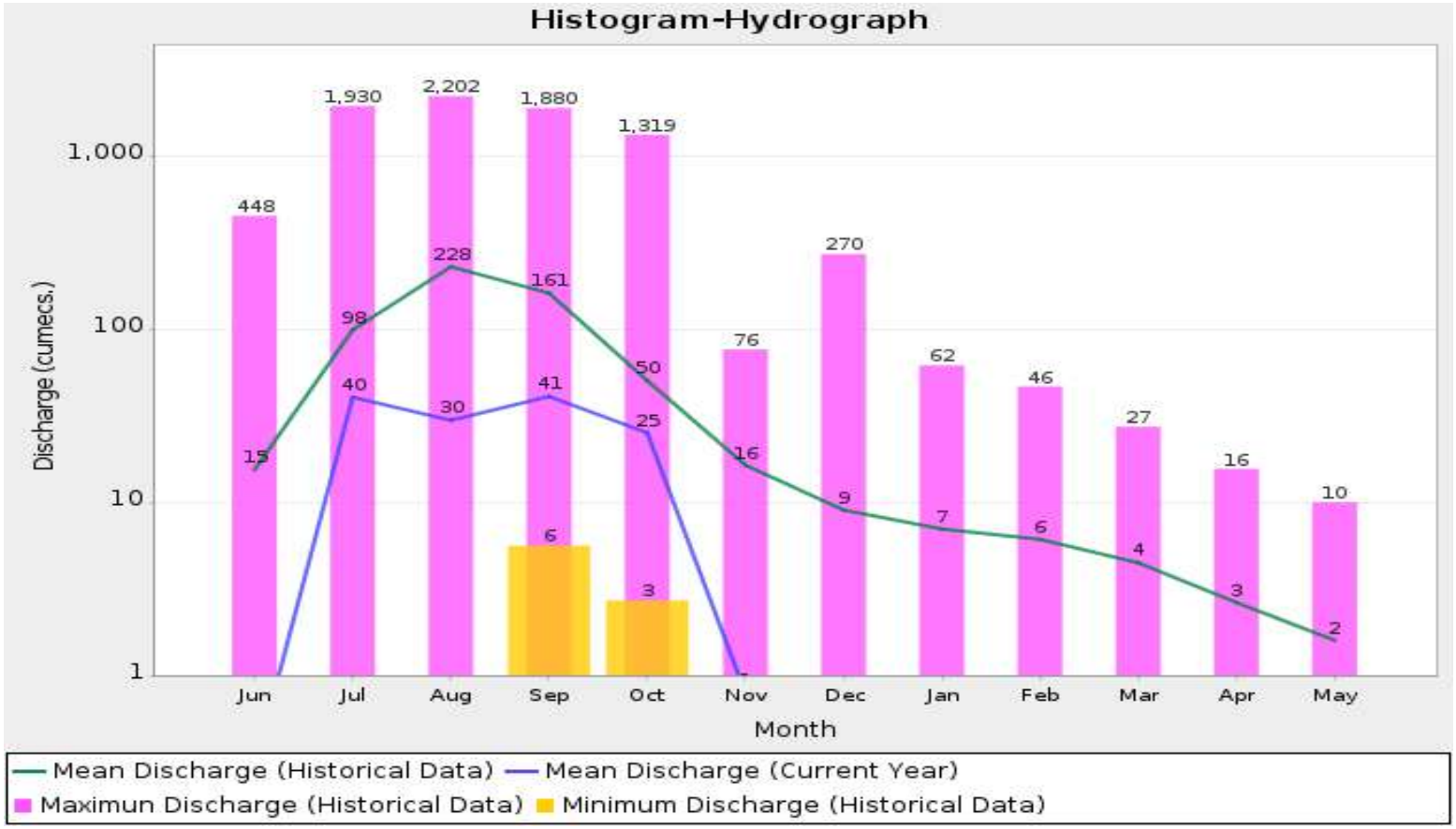
Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge #:Discarded Discharge (values changed as per rating curve)

Note:Missing values ignored while arriving at Annual Runoff

Histogram- Hydrograph for Water Year : 2017-18 (Data considered : 1979-2018)

Station Name : Hiran at Patan (010215009) Division : Narmada Division, Bhopal

Local River : Hiran Sub-Division : UNSD, CWC Jabalpur



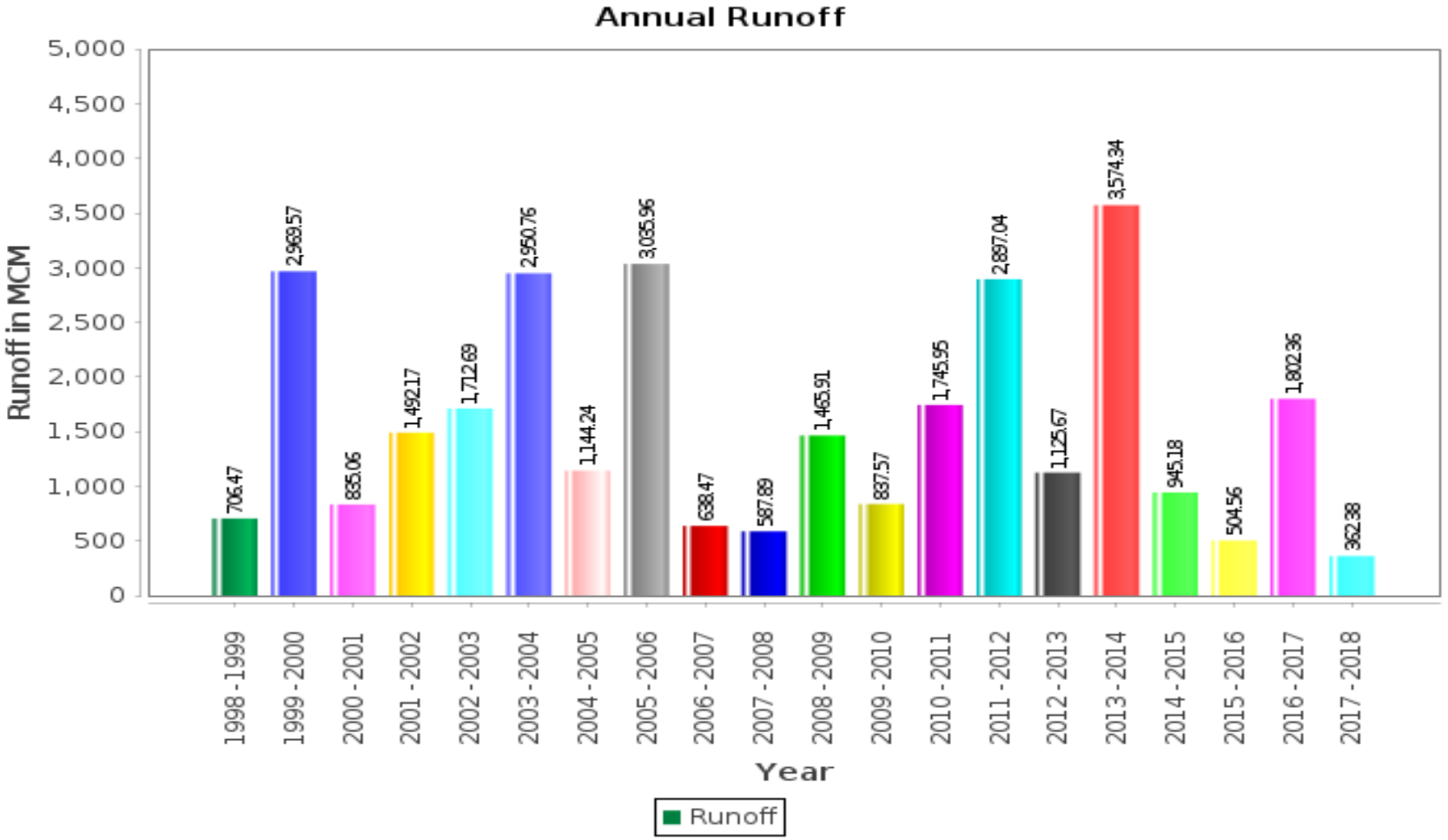
Annual Runoff Values for the period (1979 – 2018)

Station Name : Hiran at Patan (010215009)

Division : Narmada Division, Bhopal

Local River : Hiran

Sub-Division : UNSD, CWC Jabalpur

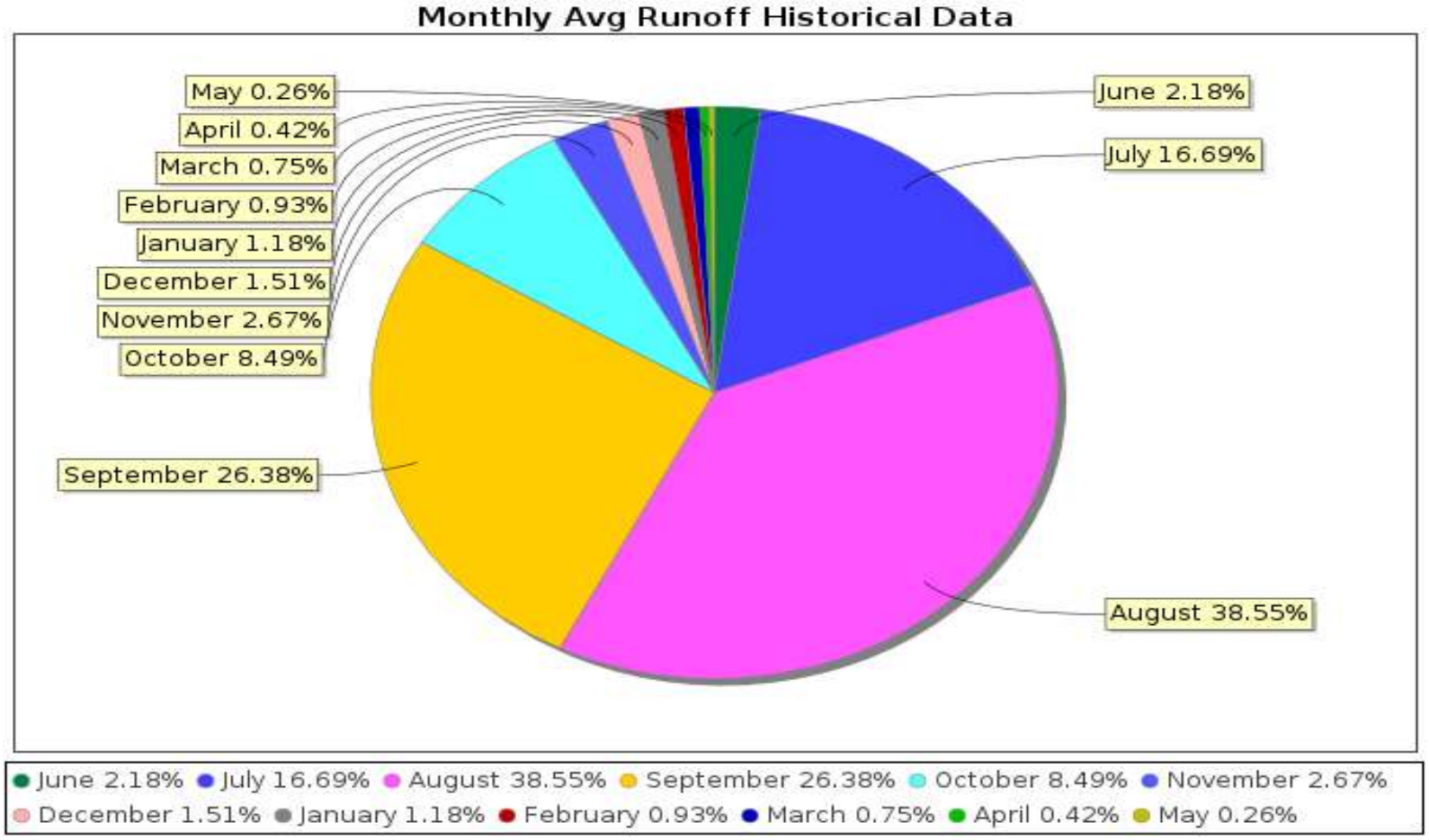


Note: Missing values have not been considered while arriving at Annual Runoff

Monthly Average Runoff based on period (1979 – 2018)

Station Name : Hiran at Patan (010215009) Division : Narmada Division, Bhopal

Local River : Hiran Sub-Division : UNSD, CWC Jabalpur



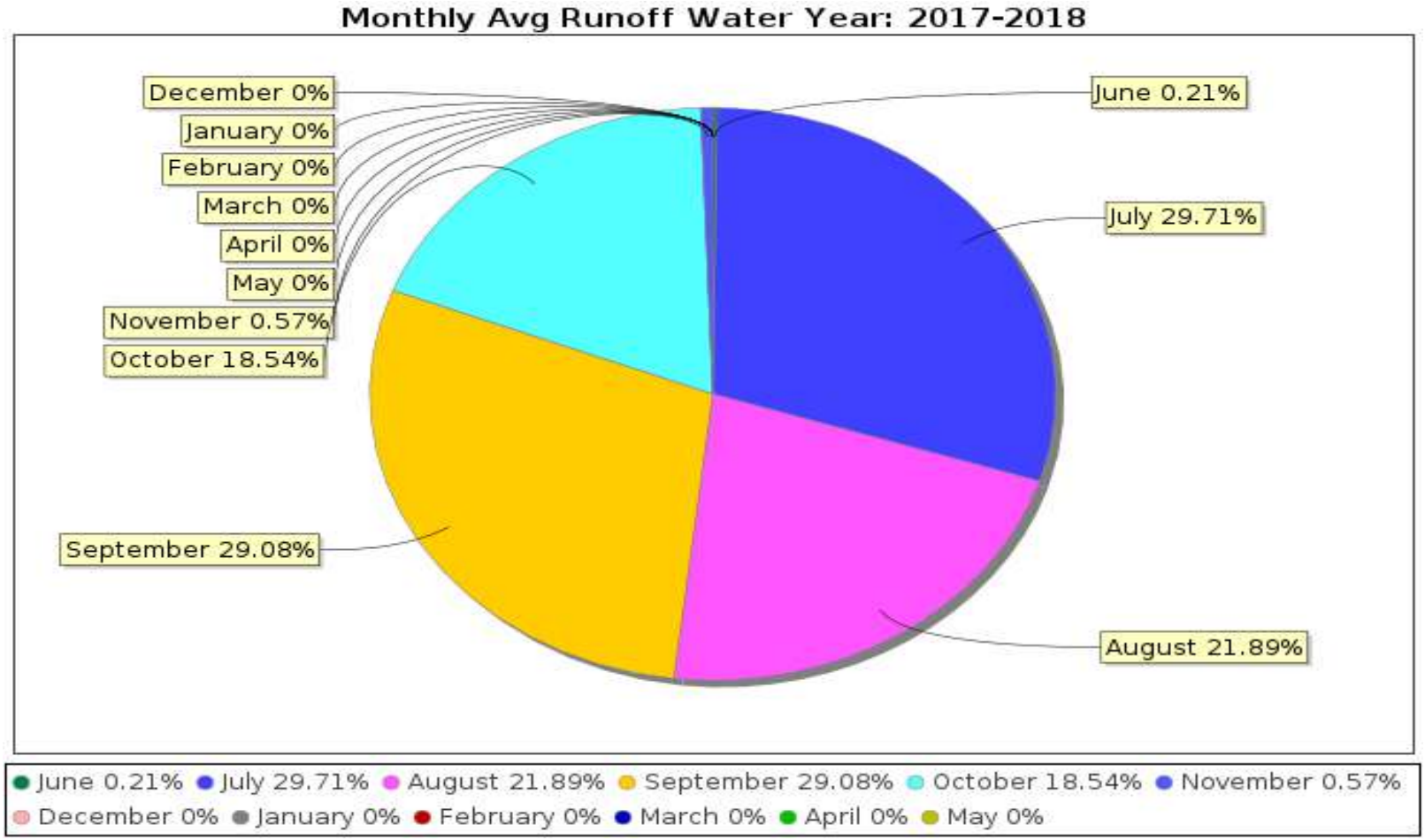
Monthly Runoff for the Year (2017-18)

Station Name : Hiran at Patan (010215009)

Division : Narmada Division, Bhopal

Local River : Hiran

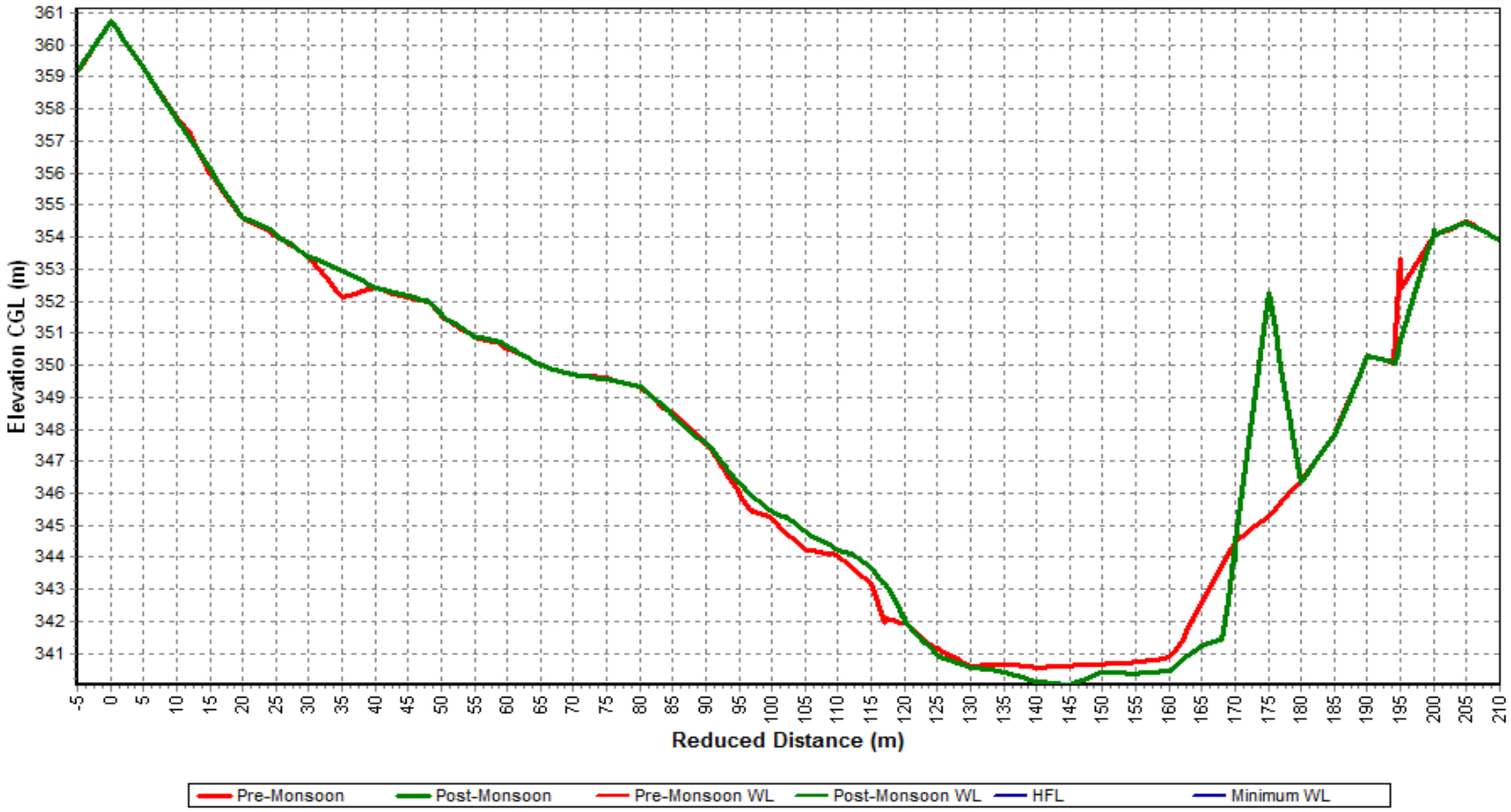
Sub-Division : UNSD, CWC Jabalpur



Pre-Monsoon & Post-Monsoon X-Section for Water Year (2017-18)

Station Name : Hiran at Patan (010215009) Division : Narmada Division, Bhopal

Local River : Hiran Sub-Division : UNSD, CWC Jabalpur



4.13 Banjar at Bamni

History sheet

HISTORY SHEET (DISCHARGE AND WATER LEVEL)

			Water Year	:	2017 - 2018
Site	:	Bamni	**Code**	:	002-NDBHP
State	:	Madhya Pradesh	**District**	:	Mandla
Basin	:	NARMADA	**Independent River**	:	Narmada
Tributary	:	-	**Sub Tributary**	:	-
Sub-Sub Tributary	:	-	**Local River**	:	Narmada
Division	:	Narmada Division(ND), Bhopal	**Sub-Division**	:	Upper Narmada Sub-Division, Jabalpur
Drainage Area	:	1864.0 Sq. Km.	**Bank**	:	Right
Latitude	:	22°29'3''	**Longitude**	:	80°22'40''
Current Zero of Gauge (m)	:	440			

CATEGORY		Opening Date	Closing Date
Gauge	:		
Discharge	:		
Sediment	:		
Water Quality	:		

Reduced Level	Opening Date	Closing Date
440.0	24/05/2014	03/06/2014
440.0	14/10/2016	15/10/2019
440.0	26/06/1999	24/05/2014
440.0	03/06/2014	14/10/2016

Annual Maximum / Minimum discharge with corresponding Water Level (m.s.l)

	Maximum			Minimum		
Year	Q (cumecs)	WL (m)	Date	Q (cumecs)	WL (m)	Date
2001-2002	0	0	25/01/2002	0	0	25/01/2002
2002-2003	0	0	24/08/2002	0	0	24/08/2002
2004-2005	75.12	441.72	02/02/2005	0	0	01/04/2005
2005-2006	1455.9	446.93	15/09/2005	0	0	01/06/2005
2006-2007	681.41	444.5	14/08/2006	0	0	01/06/2006
2007-2008	391.5	443.85	20/08/2007	0	0	01/06/2007
2008-2009	406.03	443.8	01/08/2008	0	440.76	15/06/2008
2009-2010	488.86	443.65	22/07/2009	0	0	01/06/2009
2010-2011	360.97	443.025	26/07/2010	0	0	01/06/2010
2011-2012	403.94	443.4	08/09/2011	0	0	01/06/2011
2012-2013	285.25	443.2	23/08/2012	0	0	22/05/2013
2013-2014	517.65	444.12	22/08/2013	0	0	27/05/2014
2014-2015	524.67	444.18	23/07/2014	0	0	13/06/2014
2015-2016	301.19	443.22	05/08/2015	0	0	03/05/2016
2016-2017	550.5	444.43	07/08/2016	0.36	440.21	18/02/2017
2017-2018	123.9	441.39	21/07/2017	0	440	02/06/2017

Stage Discharge Sheet for Banjar at Bamni for the period 2017-18

Day	June		July		August		September		October		November	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	0	440	0	440.2	12.01	440.19	56.01	440.79	36.8	440.54	5.78	440.2
2	0	440	0	440.53	11.62	440.18	55	440.77	33.3	440.52	5.71	440.2
3	0	440	41.37	440.61	12.93	440.21	49.1	440.7	32.4	440.51	5.67	440.2
4	0	440	29.05	440.45	8.11	440.15	42.19	440.63	31	440.49	5.59	440.2
5	0	440	19.94	440.36	8.45	440.16	39.25	440.58	30	440.48	5.42	440.2
6	0	440	23.66	440.4	13.61	440.22	36.9	440.54	28.8	440.46	5.34	440.19
7	0	440	19.01	440.34	13.9	440.23	50.38	440.73	26.65	440.44	5.14	440.19
8	0	440	17.72	440.31	15.92	440.28	41.96	440.62	25.4	440.43	5.08	440.19
9	0	440	16.7	440.29	19.37	440.35	39.36	440.58	24.93	440.42	4.99	440.19
10	0	440	15.75	440.27	55.31	440.78	58.1	440.82	26.05	440.43	4.95	440.19
11	0	440	24.14	440.4	66.47	440.89	44.6	440.65	23.87	440.41	4.84	440.19
12	0	440	23.37	440.39	50.05	440.73	41.21	440.61	22.22	440.39	4.6	440.18
13	0	440	31.18	440.49	44.1	440.66	39.37	440.58	19.17	440.36	4.3	440.18
14	0	440	27.3	440.43	42.47	440.63	37.7	440.56	18.4	440.35	3.95	440.18
15	0	440	23.15	440.39	40.07	440.6	35.77	440.53	17.05	440.33	3.55	440.18
16	0	440	25.1	440.41	37.66	440.56	32.04	440.51	15.7	440.31	3.15	440.18
17	0	440	63.81	440.87	36.71	440.54	30.99	440.49	14.08	440.29	2.75	440.17
18	0	440	52.51	440.75	31.58	440.5	29.94	440.47	13.09	440.28	2.4	440.17
19	0	440	44.39	440.66	32.15	440.51	29.15	440.46	12.46	440.27	2.2	440.17
20	0	440	50.14	440.73	38.4	440.57	37.86	440.56	11.82	440.26	2	440.17
21	0	440	123.9	441.39	36.86	440.54	53.25	440.76	11.32	440.25	1.8	440.17
22	0	440	66.18	440.89	32.11	440.51	49.56	440.72	11	440.25	1.65	440.16
23	0	440	50	440.72	29.29	440.46	55.2	440.78	9.6	440.24	1.65	440.16
24	0	440	45.08	440.67	25.32	440.41	51.48	440.74	7.96	440.23	1.6	440.16
25	0	440	41.03	440.61	42.1	440.62	47.75	440.7	7	440.22	1.58	440.16
26	0	440	37.85	440.56	43.17	440.63	45.24	440.66	6.79	440.21	1.57	440.16
27	0	440.2	33.19	440.52	41.4	440.61	42.16	440.63	6.66	440.21	1.57	440.15
28	0	440.19	31.27	440.49	47.05	440.69	40.27	440.6	6.57	440.21	1.54	440.15
29	0	440.16	15.14	440.27	57.84	440.81	38.53	440.57	6.25	440.21	1.53	440.15
30	0	440.2	14.06	440.23	83.41	441.04	37	440.55	5.94	440.2	1.52	440.15
31			12.98	440.21	62.7	440.87			5.94	440.2		
Ten-Daily Mean												
I Ten-Daily	0	440	18.32	440.38	17.12	440.28	46.82	440.68	29.53	440.47	5.37	440.2
II Ten-Daily	0	440	36.51	440.55	41.97	440.62	35.86	440.54	16.79	440.32	3.37	440.18
III Ten-Daily	0	440.08	42.79	440.6	45.57	440.65	46.04	440.67	7.73	440.22	1.6	440.16
Monthly												
Min.	0	440	0	440.2	8.11	440.15	29.15	440.46	5.94	440.2	1.52	440.15
Max.	0	440.2	123.9	441.39	83.41	441.04	58.1	440.82	36.8	440.54	5.78	440.2
Mean	0	440.03	32.54	440.51	34.89	440.52	42.91	440.63	18.02	440.34	3.45	440.18

Annual Runoff in MCM : 352.12

Peak Observed Discharge = 123.9 cumecs on 21/7/2017 Corres. Water Level 441.39 m

Lowest Observed Discharge = 0cumecs on 2/6/2017 Corres. Water Level 440 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge #:Discarded Discharge (values changed as per rating curve)

Note:Missing values ignored while arriving at Annual Runoff

Stage Discharge Sheet for Banjar at Bamni for the period 2017-18

Day	December		January		February		March		April		May	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	1.49	440.15	0.3	440.1	0	440.07	0	440.07	0	440	0	440
2	1.47	440.15	0.29	440.1	0	440.07	0	440.07	0	440	0	440
3	1.44	440.15	0.28	440.1	0	440.07	0	440.07	0	440	0	440
4	1.42	440.14	0.27	440.1	0	440.07	0	440.07	0	440	0	440
5	1.33	440.14	0.26	440.1	0	440.07	0	440.07	0	440	0	440
6	1.23	440.14	0.24	440.1	0	440.06	0	440.06	0	440	0	440
7	1.13	440.14	0	440.09	0	440.06	0	440.06	0	440	0	440
8	1.08	440.14	0	440.09	0	440.06	0	440.06	0	440	0	440
9	1.04	440.14	0	440.09	0	440.06	0	440.06	0	440	0	440
10	0.89	440.13	0	440.09	0	440.06	0	440.05	0	440	0	440
11	0.73	440.13	0	440.09	0	440.06	0	440.05	0	440	0	440
12	0.71	440.13	0	440.09	0	440.06	0	440.05	0	440	0	440
13	0.68	440.13	0	440.09	0	440.08	0	440.05	0	440	0	440
14	0.69	440.13	0	440.09	0	440.01	0	440.05	0	440	0	440
15	0.67	440.13	0	440.09	0	440.09	0	440.05	0	440	0	440
16	0.66	440.13	0	440.08	0	440.08	0	440.04	0	440	0	440
17	0.65	440.12	0	440.08	0	440.08	0	440.04	0	440	0	440
18	0.64	440.12	0	440.08	0	440.11	0	440.04	0	440	0	440
19	0.63	440.12	0	440.08	0	440.09	0	440.04	0	440	0	440
20	0.59	440.12	0	440.08	0	440.09	0	440	0	440	0	440
21	0.56	440.12	0	440.08	0	440.09	0	440	0	440	0	440
22	0.52	440.12	0	440.08	0	440.08	0	440	0	440	0	440
23	0.49	440.12	0	440.08	0	440.08	0	440	0	440	0	440
24	0.46	440.12	0	440.08	0	440.08	0	440	0	440	0	440
25	0.43	440.11	0	440.07	0	440.08	0	440	0	440	0	440
26	0.4	440.11	0	440.07	0	440.08	0	440	0	440	0	440
27	0.38	440.11	0	440.07	0	440.07	0	440	0	440	0	440
28	0.35	440.11	0	440.07	0	440.07	0	440	0	440	0	440
29	0.34	440.11	0	440.07			0	440	0	440	0	440
30	0.33	440.11	0	440.07			0	440	0	440	0	440
31	0.32	440.1	0	440.07			0	440			0	440
Ten-Daily Mean												
I Ten-Daily	1.25	440.14	0.17	440.1	0	440.07	0	440.06	0	440	0	440
II Ten-Daily	0.66	440.13	0	440.08	0	440.07	0	440.04	0	440	0	440
III Ten-Daily	0.41	440.11	0	440.07	0	440.08	0	440	0	440	0	440
Monthly												
Min.	0.32	440.1	0	440.07	0	440.01	0	440	0	440	0	440
Max.	1.49	440.15	0.3	440.1	0	440.11	0	440.07	0	440	0	440
Mean	0.78	440.13	0.06	440.08	0	440.07	0	440.03	0	440	0	440

Annual Runoff in mm : **188.91**

Peak Computed Discharge = 58.1 cumecs on 10/9/2017 **Corres. Water Level 440.82 m**

Lowest Computed Discharge = 0cumecs on 17/1/2018 **Corres. Water Level 440.08 m**

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge #:Discarded Discharge (values changed as per rating curve)

Note:Missing values ignored while arriving at Annual Runoff

Histogram- Hydrograph for Water Year : 2017-18(Data considered : 2000-2018)

Station Name : Banjar at Bamni (NCA SITE) Division : Narmada Division, Bhopal

Local River : Banjar Sub-Division : UNSD, CWC Jabalpu

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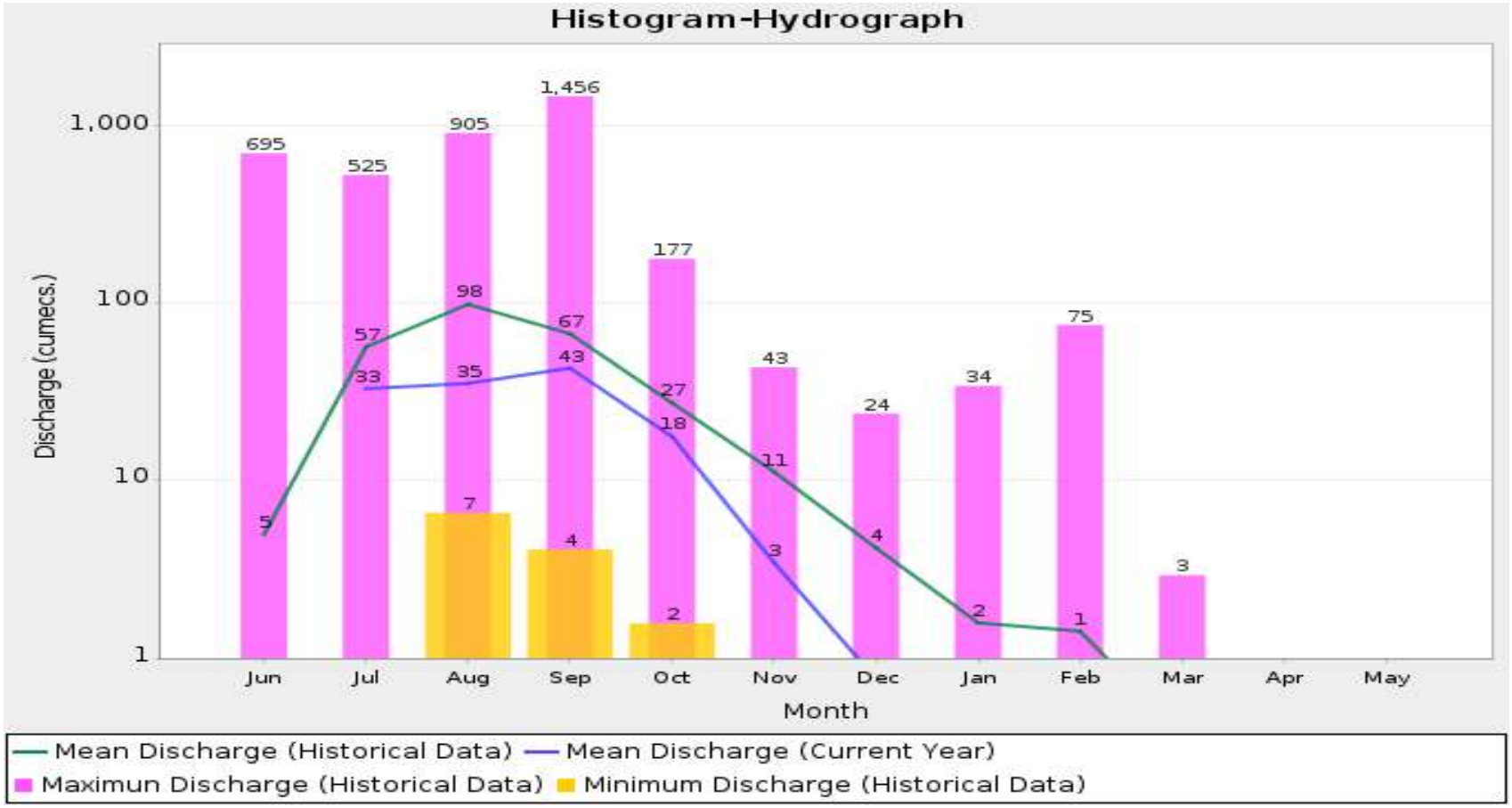


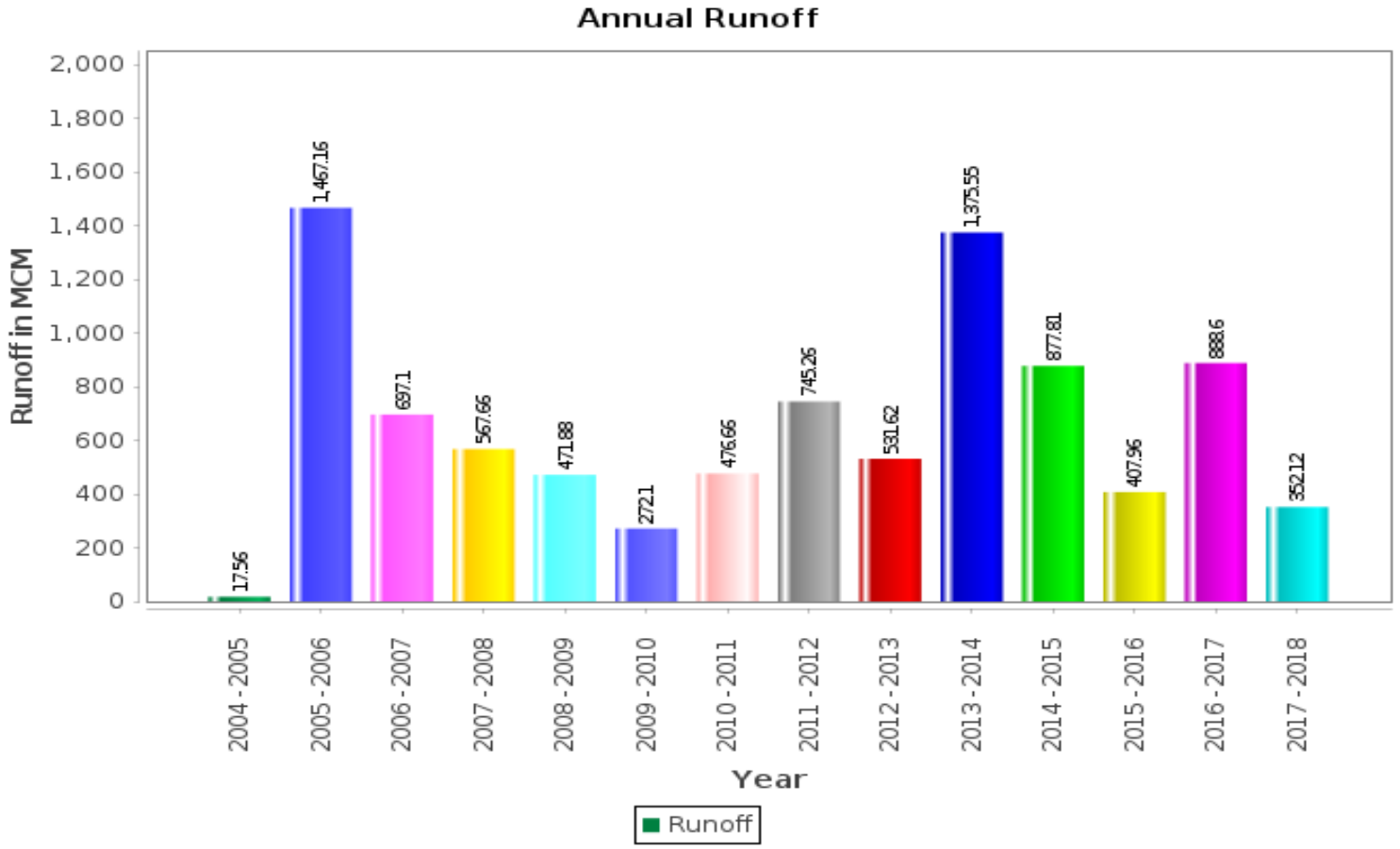
Annual Runoff Values for the period (2000-2018)

Station Name : Banjar at Bamni (NCA SITE)

Division : Narmada Division, Bhopal

Local River : Banjar

Sub-Division : UNSD, CWC Jabalpur

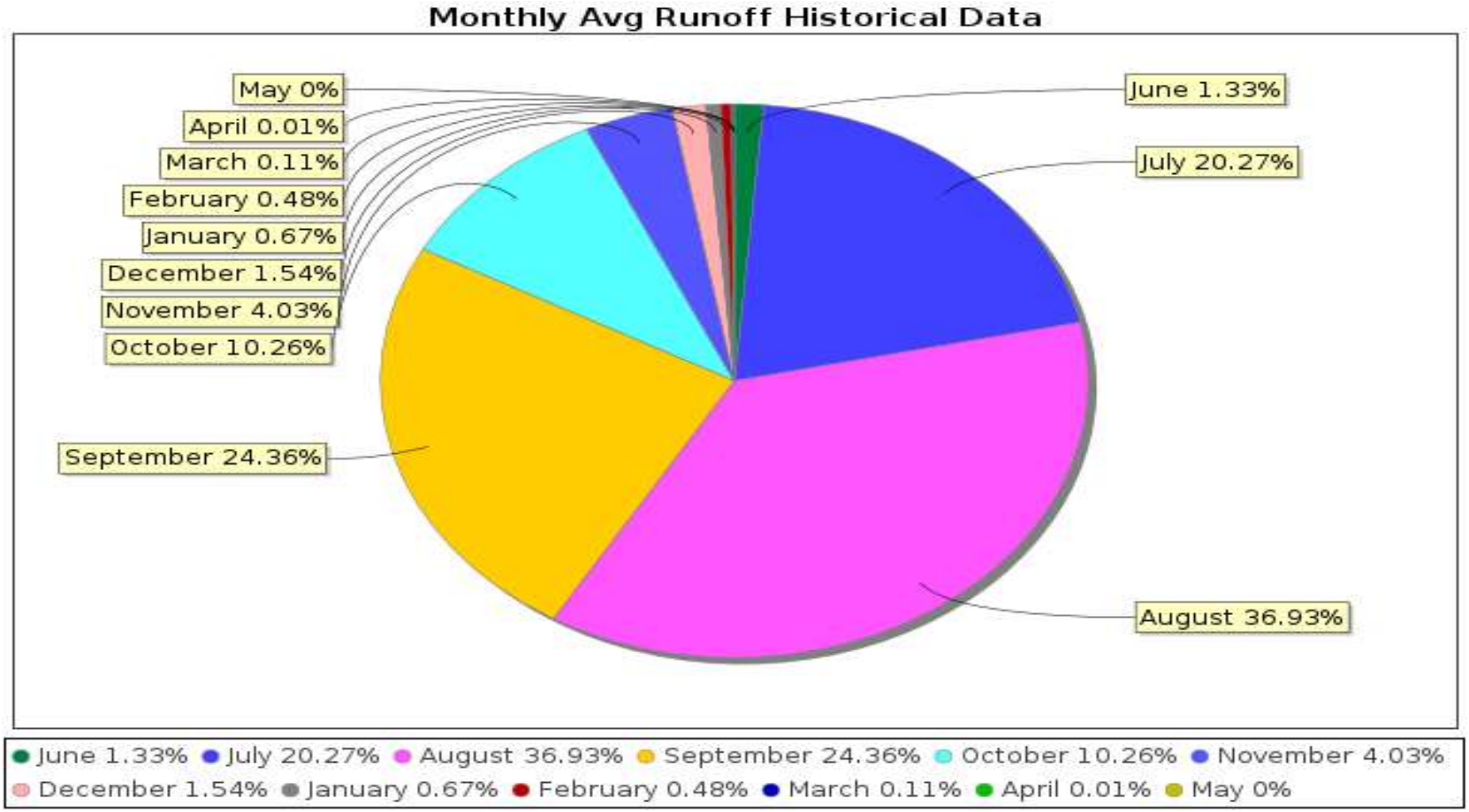


Note: Missing values have not been considered while arriving at Annual Runoff

Monthly Average Runoff based on period (2000– 2018)

Station Name : Banjar at Bamni (NCA SITE) Division : Narmada Division, Bhopal

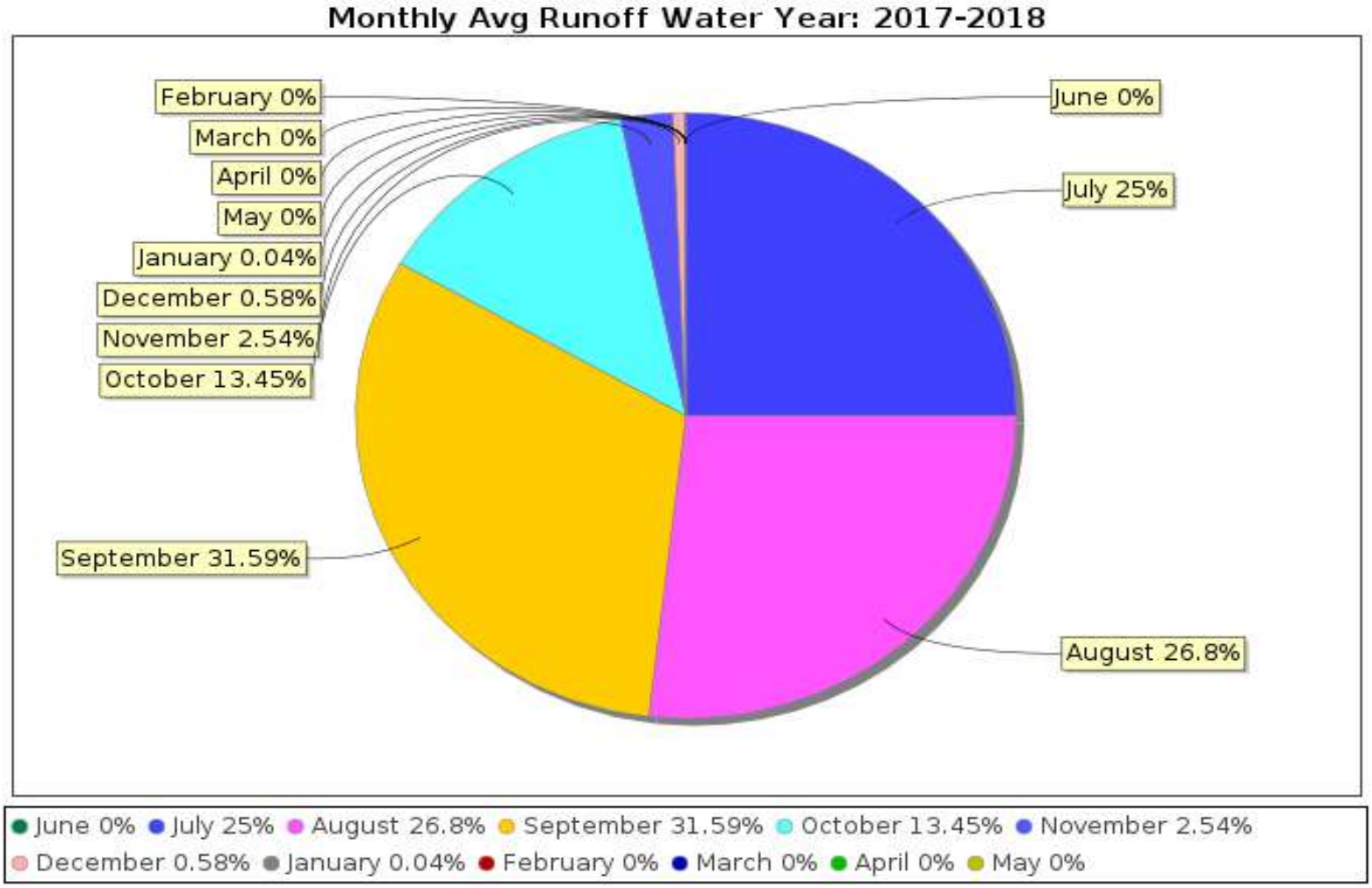
Local River : Banjar Sub-Division : UNSD, CWC Jabalpur



Monthly Runoff for the Year (2017-18)

Station Name : Banjar at Bamni (NCA SITE) Division : Narmada Division, Bhopal

Local River : Banjar Sub-Division : UNSD, CWC Jabalpur



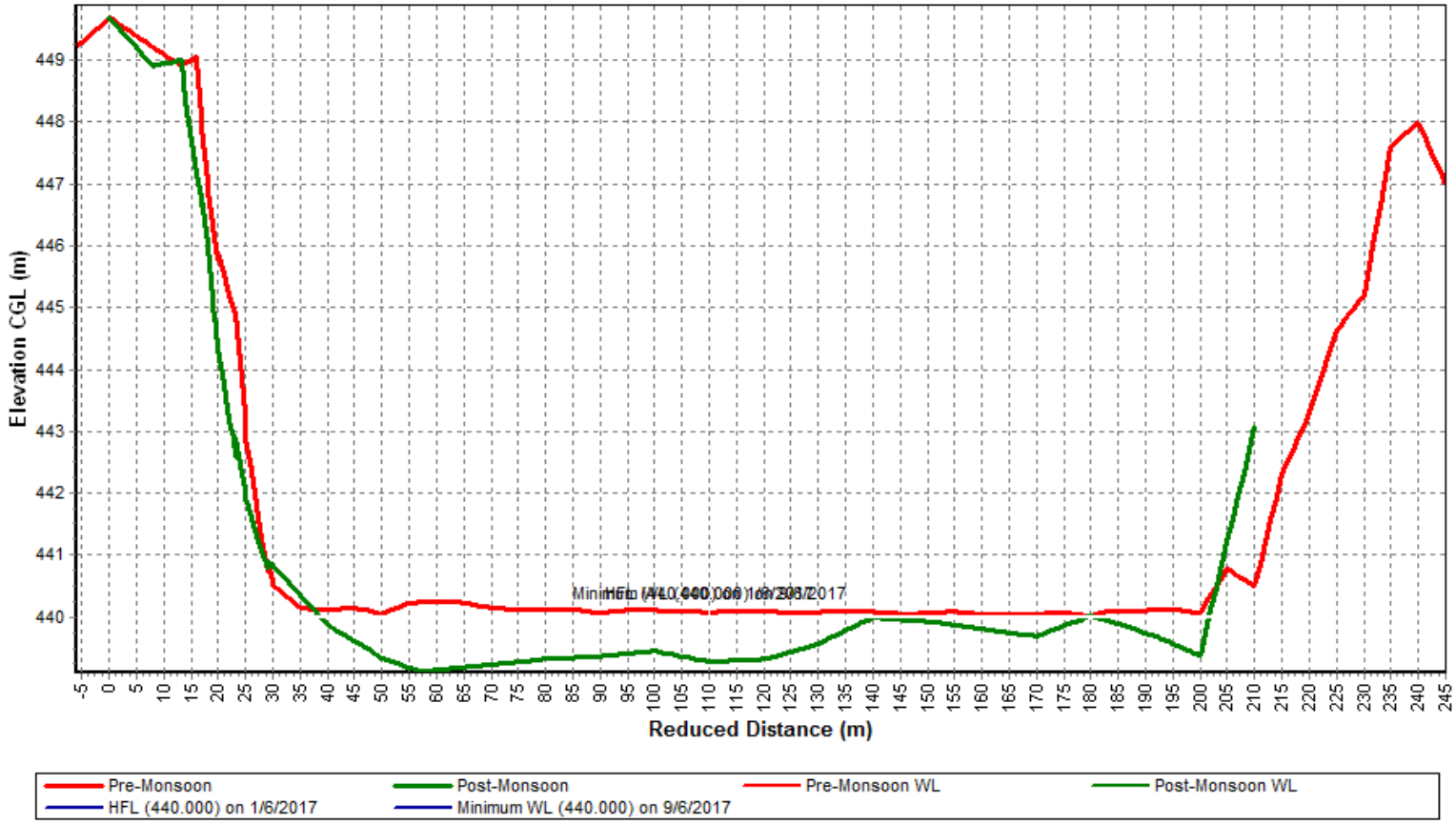
Pre-Monsoon & Post-Monsoon X-Section for Water Year (2017-18)

Station Name : Banjar at Bamni (NCA SITE)

Division : Narmada Division, Bhopal

Local River : Banjar

Sub-Division : UNSD, CWC Jabalpur



4.14 Burhner at Mohgaon

History Sheet

HISTORY SHEET (DISCHARGE AND WATER LEVEL)

			Water Year	:	2017 - 2018
Site	:	Mohgaon	**Code**	:	003-NDBHP
State	:	Madhya Pradesh	**District**	:	Mandla
Basin	:	NARMADA	**Independent River**	:	Narmada
Tributary	:	-	**Sub Tributary**	:	-
Sub-Sub Tributary	:	-	**Local River**	:	Burhner
Division	:	Narmada Division(ND), Bhopal	**Sub-Division**	:	Upper Narmada Sub-Division, Jabalpur
Drainage Area	:	3921.0 Sq. Km.	**Bank**	:	Right
Latitude	:	22°45'56''	**Longitude**	:	80°37'21''
Current Zero of Gauge (m)	:	447			

CATEGORY		Opening Date	Closing Date
Gauge	:	13/01/1977	
Discharge	:	13/01/1977	
Sediment	:	22/08/1992	
Water Quality	:		

Reduced Level	Opening Date	Closing Date
447.0	31/05/2014	31/05/2015
447.0	02/01/2018	31/12/2020
447.0	01/06/2015	01/01/2018
447.0	13/01/1977	31/05/2014
447.0	01/01/2013	30/05/2014

Annual Maximum / Minimum discharge with corresponding Water Level (m.s.l)						
	Maximum			Minimum		
Year	Q (cumecs)	WL (m)	Date	Q (cumecs)	WL (m)	Date
1976-1977	1.5	447.1	16/01/1977	0.1	446.955	25/03/1977
1977-1978	20.3	449.565	05/02/1978	0	448.76	19/05/1978
1978-1979	730.5	455.08	05/08/1978	0	448.525	25/05/1979
1979-1980	914	458.03	09/08/1979	0	448.51	01/06/1979
1980-1981	1370	457.39	16/07/1980	0	448.645	01/06/1980
1981-1982	691.8	453.33	02/07/1981	0	449.135	01/05/1982
1982-1983	2120	455.315	16/08/1982	0	449.125	01/06/1982
1983-1984	1020	455.05	08/09/1983	0	449.13	01/06/1983
1984-1985	9000	462.9	18/08/1984	0.1	449.065	01/06/1984
1985-1986	5700	461.85	08/08/1985	0.1	449.295	01/06/1985
1986-1987	3690	460.3	08/07/1986	0.1	449.195	01/06/1986
1987-1988	3022	458.58	15/09/1987	0.04	449.155	26/05/1988
1988-1989	2850	458.65	04/08/1988	0	449.12	08/06/1988
1989-1990	1085	454.1	12/09/1989	0.03	449.255	29/04/1990
1990-1991	4100	459.2	25/06/1990	0.05	449.23	30/05/1991
1991-1992	7184	463.62	23/08/1991	0.08	449.17	15/05/1992
1992-1993	3688	459.7	11/09/1992	0.01	449.38	12/05/1993
1993-1994	1900	456.21	26/09/1993	0.04	449.385	10/06/1993
1994-1995	3950	459.78	20/07/1994	0.17	449.265	05/06/1994
1995-1996	2960	458.4	09/08/1995	0.13	449.265	14/06/1995
1996-1997	902	453.96	05/08/1996	0.1	449.2	30/05/1997
1997-1998	2185	456.65	29/07/1997	0.07	449.205	16/06/1997
1998-1999	1750	456	06/07/1998	0.09	449.15	31/05/1999
1999-2000	2600	457.67	23/06/1999	0.08	449.165	09/06/1999
2000-2001	2750	457.08	27/07/2000	0.09	449.21	29/05/2001
2001-2002	2860	458.02	13/07/2001	0.07	449.21	25/05/2002
2002-2003	1725	455.95	18/08/2002	0.01	449.095	25/05/2003
2003-2004	6469	462.82	29/08/2003	0.01	449.04	11/06/2003
2004-2005	11600	467.3	08/08/2004	0.1	449.21	08/06/2004
2005-2006	5400.36	461.6	06/08/2005	0.09	449.4	03/06/2005
2006-2007	6723	462.34	31/07/2006	0.11	449.25	16/05/2007
2007-2008	1084.79	454.5	08/07/2007	0.04	449.16	21/05/2008
2008-2009	939.79	454.08	01/08/2008	0.13	449.095	09/05/2009
2009-2010	364.07	451.92	21/07/2009	0	449.1	02/06/2009
2010-2011	2890.09	456.85	02/09/2010	0	449.175	01/06/2010
2011-2012	1863.79	456.39	07/09/2011	0.03	449.17	08/06/2011

2012-2013	1180	454.05	09/07/2012	0	449.13	04/06/2012
2013-2014	1508.76	454.93	22/08/2013	0.2	449.195	02/06/2013
2014-2015	2149.16	457.35	06/08/2014	0.24	449.23	01/06/2014
2015-2016	1805.08	455.175	04/08/2015	0.09	449.1	24/05/2016
2016-2017	1551.26	455.05	07/08/2016	0	449.04	22/05/2017
2017-2018	1424.6	456.25	16/07/2017	0	449.15	08/06/2017

Stage Discharge Sheet for Burhner at Mohgaon for the period 2017-18

Day	June		July		August		September		October		November	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	0	449	17.85	449.72	34.13	450.02	207.09	451.72	35.5	450	10.2	449.56
2	0	449.13	24	449.81	31.07	449.98	196	451.14	34.5	449.96	10.12	449.56
3	0	449.12	32.55	449.83	30.18	449.95	90	450.61	33.75	449.93	9.91	449.55
4	0	449.12	87.66	450.47	27.73	449.84	74.18	450.31	30.98	449.88	9	449.55
5	0	449.11	97.2	450.57	28.22	449.86	55.65	450.18	28.81	449.85	9	449.55
6	0	449.11	39.53	450.11	27	449.83	40.93	450.09	35.17	449.93	9.75	449.54
7	0	449.13	25.92	449.9	31.38	449.88	45.12	450.14	40.07	450.08	9.72	449.54
8	0	449.15	22.65	449.8	318	451.41	41.28	450.09	37	450.04	9.65	449.54
9	0	449.15	16	449.69	630.7	452.92	54.31	450.17	45.96	450.14	9.57	449.61
10	0	449.14	18.37	449.73	661.9	453	76	450.34	37.95	450.07	9.38	449.6
11	0	449.13	18.05	449.7	427.7	452.12	112.7	450.68	54.05	450.17	9.3	449.6
12	0	449.13	84.01	450.43	191.9	451.12	85.86	450.45	35.37	449.98	9.3	449.6
13	0	449.12	64.73	450.27	125	450.78	76.59	450.33	32.38	449.87	8.95	449.59
14	0	449.14	35.77	450.03	90.25	450.62	79.01	450.36	28.99	449.84	8.82	449.59
15	0	449.15	33.62	450.01	85	450.47	74.71	450.31	24	449.81	8.32	449.58
16	0	449.14	1424.6	456.25	72.22	450.32	78.03	450.35	22.55	449.79	8.25	449.58
17	0	449.13	375.5	451.95	54.51	450.17	89	450.58	20.13	449.76	8.16	449.58
18	0	449.17	1010.9	453.75	59.16	450.22	91.23	450.61	18.24	449.73	7.7	449.57
19	0	449.35	336.6	451.75	126.4	450.78	205.8	451.26	17	449.69	7.6	449.57
20	0	449.59	549.6	452.73	72	450.32	317.5	451.48	14.6	449.66	7.39	449.56
21	0	449.57	570.6	452.85	63.07	450.27	537	452.68	13.59	449.64	7.32	449.56
22	0	449.59	206.8	451.27	37.24	450.05	318.6	451.52	12.5	449.62	7.09	449.55
23	0	449.52	120	450.74	35.55	450.03	179.7	451.05	12.33	449.61	6.92	449.54
24	0	450.34	127.1	450.78	32.49	450.01	114	450.7	11.84	449.6	6.81	449.54
25	0	449.82	105.2	450.62	114	450.7	86.7	450.46	11.59	449.6	6.75	449.53
26	0	449.75	88.69	450.49	91.78	450.62	77.44	450.35	11.44	449.59	6.6	449.52
27	3.32	449.45	81.19	450.41	124	450.75	58.81	450.24	11.2	449.59	6.6	449.52
28	17.51	449.68	124.5	450.75	113	450.68	45.34	450.14	10.82	449.58	6.42	449.51
29	24.46	449.81	90.32	450.5	127.5	450.77	37.54	450.06	10.8	449.58	6.4	449.51
30	35.94	450	75	450.33	462	452.34	36	450.02	10.68	449.57	6.18	449.5
31			45.13	450.14	169	451.02			10.55	449.57		
Ten-Daily Mean												
I Ten-Daily	0	449.12	38.17	449.96	182.03	450.67	88.06	450.48	35.97	449.99	9.63	449.56
II Ten-Daily	0	449.21	393.34	451.69	130.41	450.69	121.04	450.64	26.73	449.83	8.38	449.58
III Ten-Daily	8.12	449.75	148.59	450.81	124.51	450.66	149.11	450.72	11.58	449.6	6.71	449.53
Monthly												
Min.	0	449	16	449.69	27	449.83	36	450.02	10.55	449.57	6.18	449.5
Max.	35.94	450.34	1424.6	456.25	661.9	453	537	452.68	54.05	450.17	10.2	449.61
Mean	2.71	449.36	193.37	450.82	145.65	450.67	119.4	450.61	24.76	449.8	8.24	449.56

Annual Runoff in MCM : 1339.08

Peak Observed Discharge = 1424.6 cumecs on 16/7/2017 Corres. Water Level 456.25 m

Lowest Observed Discharge = 0cumecs on 8/6/2017 Corres. Water Level 449.15 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge #:Discarded Discharge (values changed as per rating curve)

Note:Missing values ignored while arriving at Annual Runoff

Stage Discharge Sheet for Burhner at Mohgaon for the period 2017-18

Day	December		January		February		March		April		May	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	6.02	449.49	3.73	449.37	2.5	449.36	2.25	449.38	0.93	449.27	0.6	449.23
2	6	449.49	3.71	449.37	2.5	449.36	2.25	449.38	0.83	449.26	0.57	449.22
3	5.9	449.48	3.62	449.36	2.49	449.36	2.25	449.38	0.8	449.26	0.51	449.21
4	5.9	449.48	3.89	449.36	2.3	449.35	2.2	449.37	0.73	449.25	0.46	449.2
5	8.84	449.48	3.83	449.36	2.27	449.35	2.17	449.37	0.67	449.24	0.41	449.19
6	5.79	449.47	3.79	449.36	2.25	449.35	1.94	449.36	0.57	449.23	0.4	449.19
7	5.6	449.46	3.7	449.35	2.2	449.35	1.88	449.36	0.46	449.22	0.37	449.18
8	5.54	449.46	3.7	449.35	2.17	449.35	1.87	449.36	0.45	449.22	0.34	449.18
9	5.4	449.45	3.61	449.35	2.11	449.35	1.78	449.35	0.42	449.21	0.3	449.17
10	5.4	449.45	3.45	449.34	2	449.34	1.68	449.34	0.41	449.21	0.26	449.17
11	5.29	449.44	3.41	449.34	2	449.34	1.55	449.33	0.4	449.21	0.23	449.16
12	5.22	449.44	3.38	449.34	1.99	449.34	1.49	449.32	0.34	449.2	0.22	449.16
13	5.09	449.43	3.14	449.33	1.96	449.34	1.36	449.31	0.34	449.2	0.2	449.16
14	5.04	449.43	3.1	449.33	2.45	449.4	1.18	449.3	0.31	449.19	0.16	449.15
15	4.9	449.42	3.1	449.33	2.78	449.44	1.09	449.29	0.3	449.19	0.13	449.15
16	4.86	449.42	3.05	449.33	2.62	449.42	0.97	449.28	0.29	449.18	0.13	449.15
17	4.85	449.42	2.95	449.32	2.5	449.4	0.86	449.27	0.29	449.18	0.1	449.14
18	4.8	449.41	2.92	449.32	2.4	449.39	0.85	449.27	0.28	449.18	0.1	449.14
19	4.58	449.41	2.84	449.32	2.31	449.38	0.83	449.26	0.28	449.18	0.1	449.14
20	4.43	449.4	2.83	449.32	3.23	449.46	0.81	449.26	0.27	449.17	0.08	449.13
21	4.3	449.4	2.8	449.32	2.84	449.44	1.41	449.32	2.14	449.36	0.08	449.13
22	4.16	449.39	2.76	449.31	2.66	449.42	1.32	449.31	2.1	449.35	0.08	449.13
23	4.11	449.39	2.74	449.31	2.56	449.41	1.2	449.3	2.04	449.34	0.07	449.12
24	4.08	449.39	2.72	449.31	2.43	449.4	1.19	449.3	1.66	449.32	0.07	449.12
25	4	449.38	2.64	449.31	2.4	449.4	1.1	449.29	1.31	449.3	0.06	449.11
26	3.95	449.38	2.64	449.31	2.3	449.39	1.1	449.29	1.11	449.28	0.06	449.11
27	3.93	449.38	2.64	449.3	2.3	449.39	1.03	449.28	1	449.27	0.06	449.11
28	3.88	449.38	2.6	449.3	2.3	449.39	1.01	449.28	0.93	449.26	0.04	449.1
29	3.86	449.37	2.58	449.3			1	449.28	0.8	449.25	0.04	449.1
30	3.8	449.37	2.56	449.3			0.96	449.27	0.7	449.24	0.04	449.1
31	3.75	449.37	2.55	449.36			0.95	449.27			0.02	449.09
Ten-Daily Mean												
I Ten-Daily	6.04	449.47	3.7	449.36	2.28	449.35	2.03	449.36	0.63	449.24	0.42	449.19
II Ten-Daily	4.91	449.42	3.07	449.33	2.42	449.39	1.1	449.29	0.31	449.19	0.15	449.15
III Ten-Daily	3.98	449.38	2.66	449.31	2.47	449.41	1.12	449.29	1.38	449.3	0.06	449.11
Monthly												
Min.	3.75	449.37	2.55	449.3	1.96	449.34	0.81	449.26	0.27	449.17	0.02	449.09
Max.	8.84	449.49	3.89	449.37	3.23	449.46	2.25	449.38	2.14	449.36	0.6	449.23
Mean	4.98	449.42	3.14	449.33	2.5	449.36	2.25	449.38	0.93	449.27	0.6	449.23

Annual Runoff in mm : 341.51

Peak Computed Discharge = 125 cumecs on 13/8/2017 Corres. Water Level 450.78 m

Lowest Computed Discharge = 0.02cumecs on 31/5/2018 Corres. Water Level 449.09 m

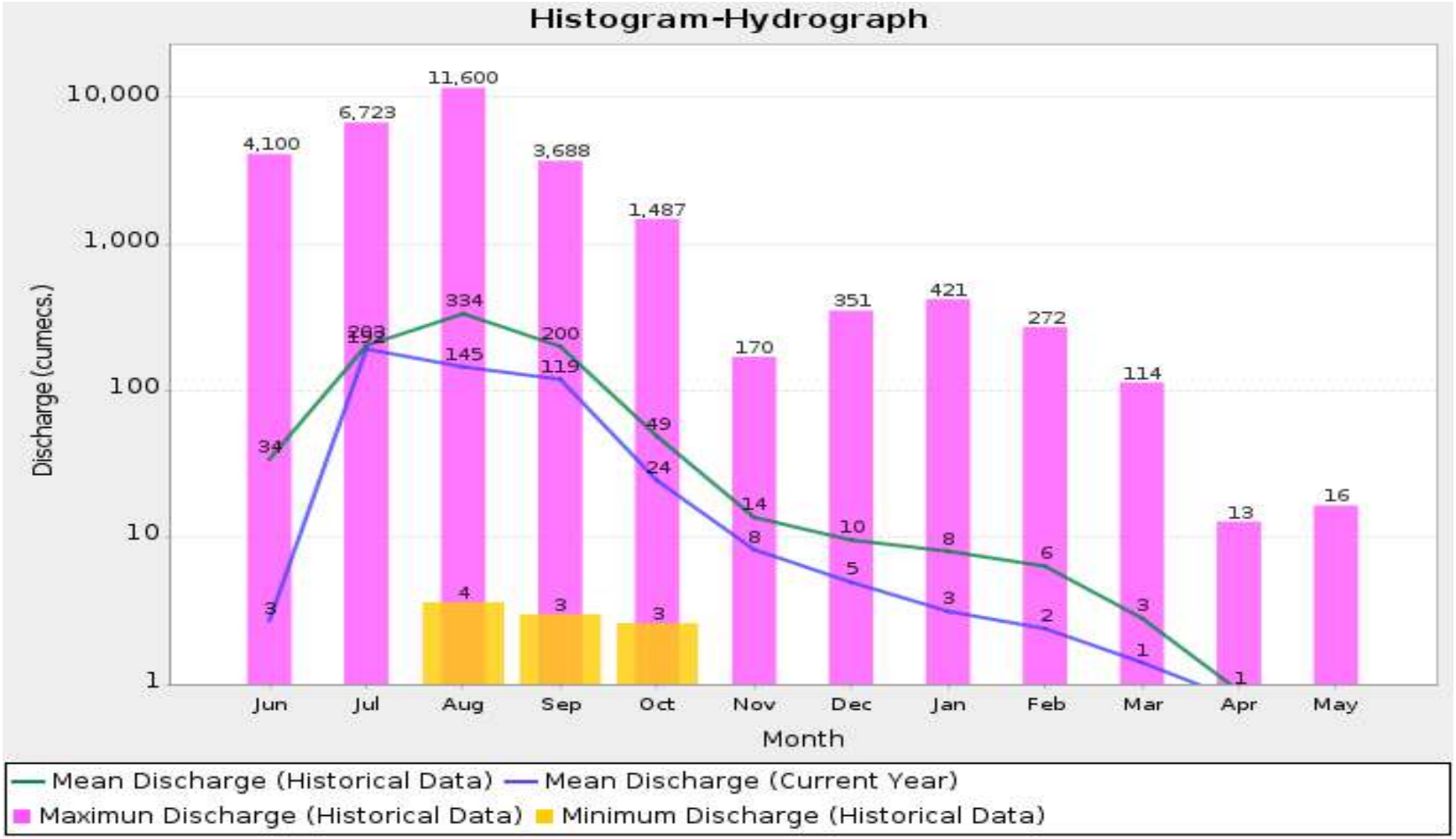
Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge #:Discarded Discharge (values changed as per rating curve)

Note:Missing values ignored while arriving at Annual Runoff

Histogram- Hydrograph for Water Year : 2017-18 (Data considered : 1977-2018)

Station Name : Burhner at Mohgaon (010215004) Division : Narmada Division, Bhopal

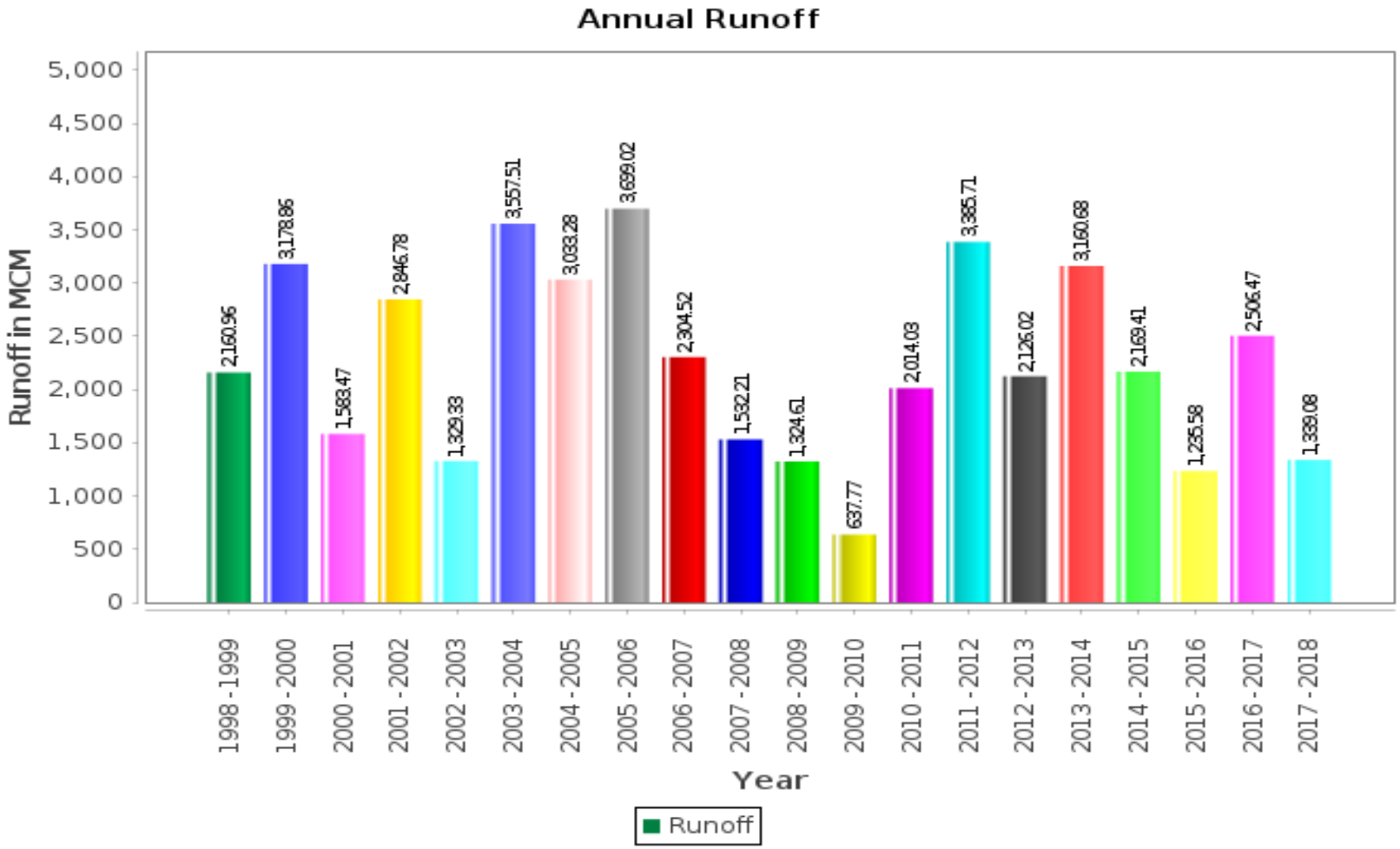
Local River : Burhner Sub-Division : UNSD, CWC Jabalpur



Annual Runoff Values for the period (1977– 2018)

Station Name : Burhner at Mohgaon (010215004) Division : Narmada Division, Bhopal

Local River : Burhner Sub-Division : UNSD, CWC Jabalpur

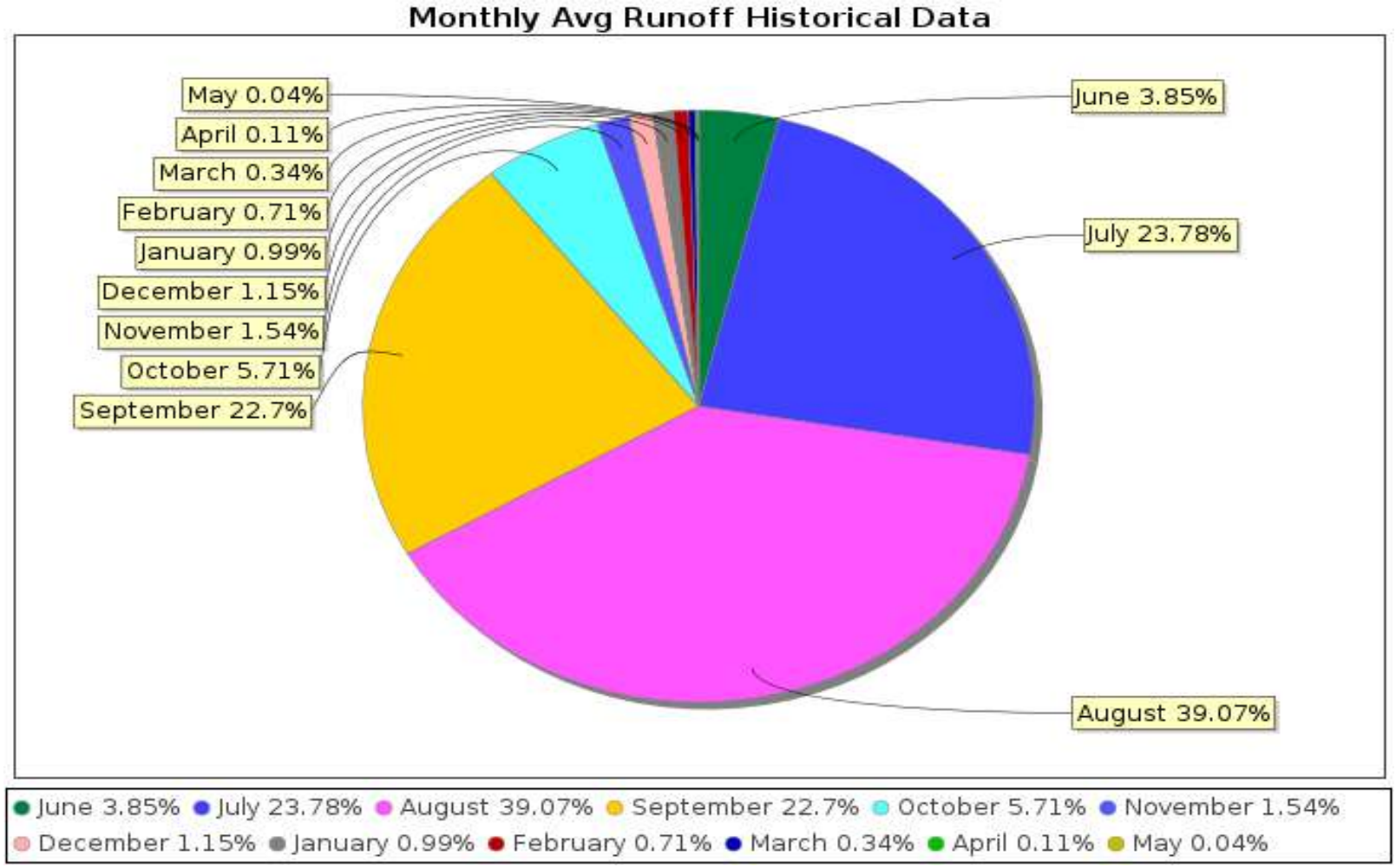


Note: Missing values have not been considered while arriving at Annual Runoff

Monthly Average Runoff based on period (1977– 2017)

Station Name : Burhner at Mohgaon (010215004) Division : Narmada Division, Bhopal

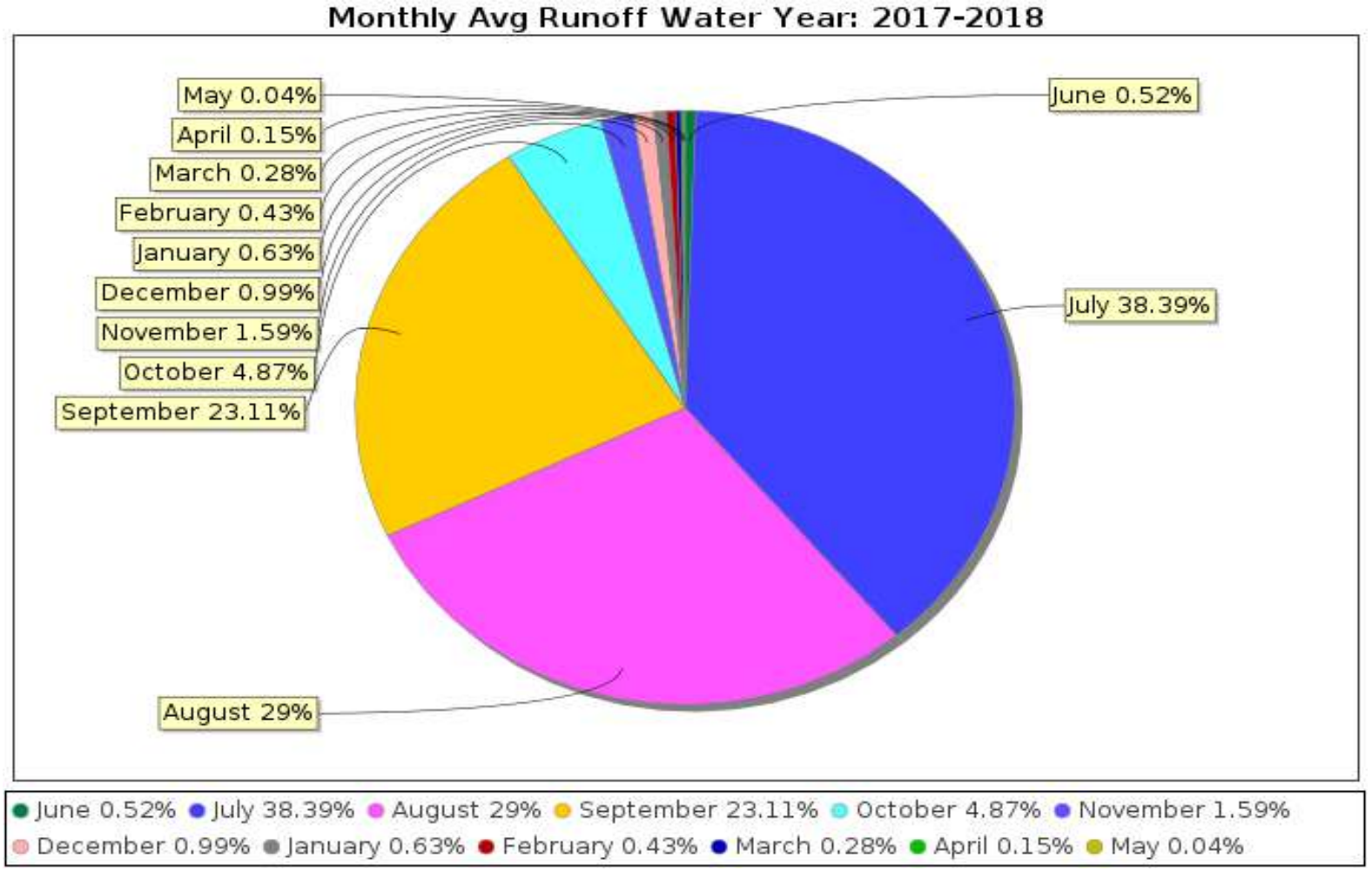
Local River : Burhner Sub-Division : UNSD, CWC Jabalpur



Monthly Runoff for the Year (2017-18)

Station Name : Burhner at Mohgaon (010215004) Division : Narmada Division, Bhopal

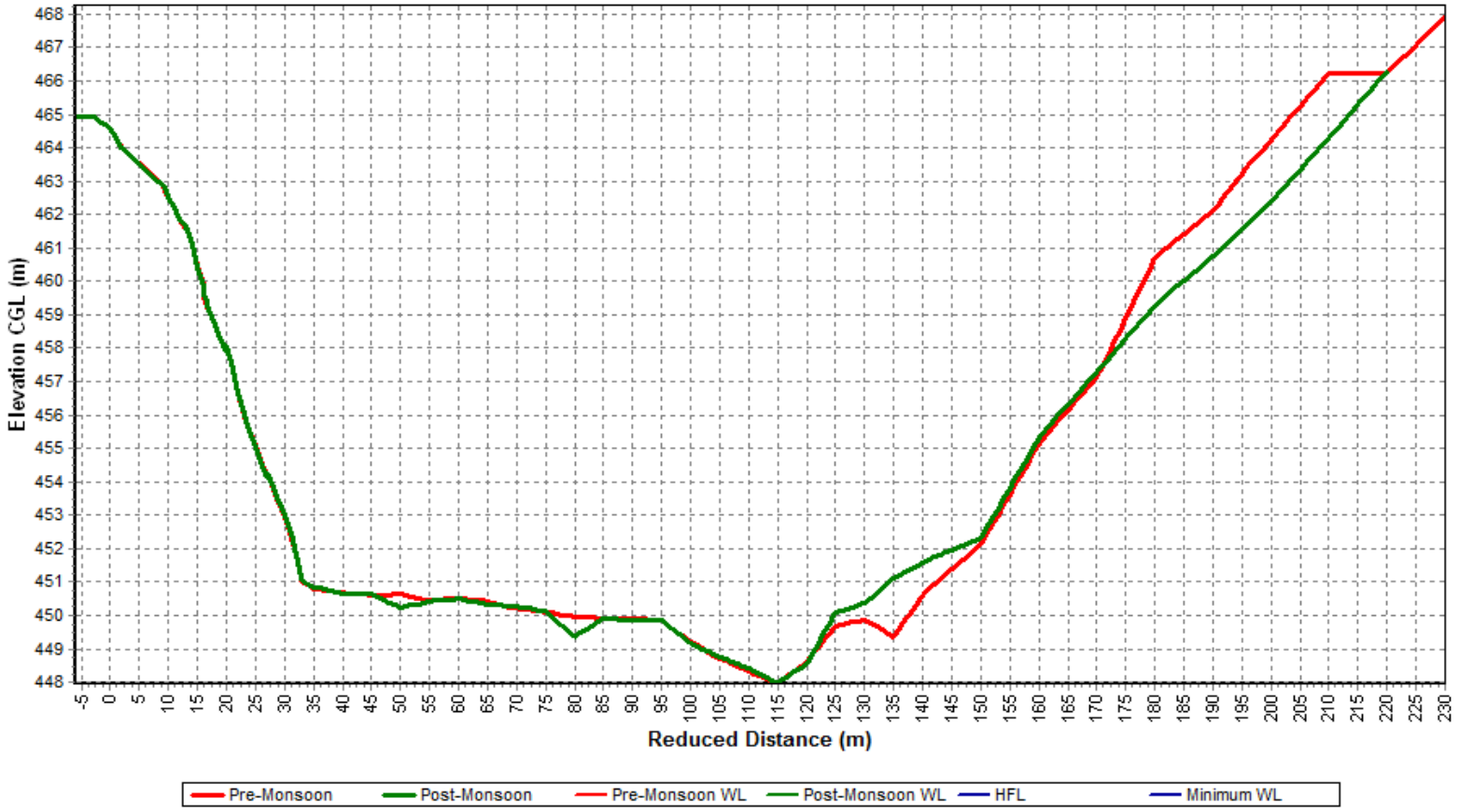
Local River : Burhner Sub-Division : UNSD, CWC Jabalpur



Pre-Monsoon & Post-Monsoon X-Section for Water Year (2017-18)

Station Name : Burhner at Mohgaon (010215004) Division : Narmada Division, Bhopal

Local River : Burhner Sub-Division : UNSD, CWC Jabalpur



4.15 Narmada at Manot

History Sheet

HISTORY SHEET (DISCHARGE AND WATER LEVEL)

			Water Year	:	2017 - 2018
Site	:	Manot	**Code**	:	009-ndbhp
State	:	Madhya Pradesh	**District**	:	Mandla
Basin	:	NARMADA	**Independent River**	:	Narmada
Tributary	:	-	**Sub Tributary**	:	-
Sub-Sub Tributary	:	-	**Local River**	:	Narmada
Division	:	Narmada Division(ND), Bhopal	**Sub-Division**	:	Upper Narmada Sub-Division, Jabalpur
Drainage Area	:	4667.0 Sq. Km.	**Bank**	:	Right
Latitude	:	22°44'8''	**Longitude**	:	80°30'43''
Current Zero of Gauge (m)	:	442			

CATEGORY		Opening Date	Closing Date
Gauge	:	16/12/1976	
Discharge	:	16/12/1976	
Sediment	:	09/11/1979	31/12/2050
Water Quality	:		

Reduced Level	Opening Date	Closing Date
442.0	01/01/2013	03/08/2015
442.0	04/08/2015	31/05/2050
442.0	16/12/1976	04/08/2015
442.0	16/06/1976	16/12/1976

Annual Maximum / Minimum discharge with corresponding Water Level (m.s.l)

	Maximum			Minimum		
Year	Q (cumecs)	WL (m)	Date	Q (cumecs)	WL (m)	Date
1976-1977	13	442.06	13/05/1977	0.5	442.79	07/05/1977
1977-1978	2125	452.5	07/08/1977	0.2	442.795	03/06/1977
1978-1979	960	446.025	06/08/1978	0.4	442.68	09/05/1979
1979-1980	2380	450.69	09/08/1979	0	442.365	29/05/1980
1980-1981	3277.1	452.115	09/09/1980	0	442.725	13/06/1980
1981-1982	1687.7	447.61	28/07/1981	0.1	442.745	15/06/1981
1982-1983	1242	448.675	16/08/1982	0.1	442.77	27/05/1983
1983-1984	2423	452.7	08/09/1983	0.1	442.79	15/06/1983
1984-1985	5660	459.65	18/08/1984	0.2	442.8	04/06/1984
1985-1986	4850	455.4	08/08/1985	0.2	443	11/06/1985
1986-1987	5762	458	08/07/1986	0.2	442.86	10/06/1986
1987-1988	6180	457.475	15/09/1987	0.25	442.755	31/05/1988
1988-1989	4130	454.1	04/08/1988	0.19	442.76	17/06/1988
1989-1990	950	446.3	14/08/1989	0.15	442.67	11/06/1989
1990-1991	2300	451.88	25/06/1990	0.6	442.9	31/05/1991
1991-1992	6520	459.3	23/08/1991	0.26	442.995	07/06/1991
1992-1993	3340	453.2	11/09/1992	0.04	442.975	30/05/1993
1993-1994	2980	452.2	17/08/1993	0.02	442.95	13/06/1993
1994-1995	4410	455.55	21/07/1994	0.2	443.2	14/06/1994
1995-1996	3300	453.15	09/08/1995	0.4	443.015	16/06/1995
1996-1997	1650	448.94	27/07/1996	0.34	442.975	04/06/1996
1997-1998	3160	451.6	01/08/1997	0.42	442.975	15/06/1997
1998-1999	2010	449.92	06/07/1998	0.88	443.045	21/05/1999
1999-2000	4390	452.5	18/09/1999	0.84	443.08	08/05/2000
2000-2001	3000	451.62	20/07/2000	0.6	443.02	24/05/2001
2001-2002	3600	452.25	13/07/2001	0.3	442.93	21/05/2002
2002-2003	1940	449.4	09/09/2002	0.1	442.77	29/05/2003
2003-2004	4980	455.9	29/08/2003	0.02	442.49	15/06/2003
2004-2005	5760	458.8	08/08/2004	0.6	442.87	29/05/2005
2005-2006	4485.86	454.775	06/08/2005	0.01	442.85	12/06/2005
2006-2007	6806.05	453.31	31/07/2006	0.09	442.84	31/05/2007
2007-2008	970.67	446.805	06/09/2007	0.01	442.83	02/06/2007
2008-2009	1392.6	447.6	11/08/2008	0.05	442.8	06/06/2008
2009-2010	1068.8	446.85	09/09/2009	0	442.55	30/05/2010
2010-2011	2435.44	449.4	26/07/2010	0	442.515	16/06/2010
2011-2012	2439.3	451.83	07/09/2011	0	443.035	29/04/2012
2012-2013	1311.72	448.5	11/08/2012	0.29	442.87	14/06/2012
2013-2014	1572.52	449.2	09/08/2013	0.52	442.855	25/05/2014

2014-2015	3474.62	453.19	06/08/2014	0.27	442.78	15/06/2014
2015-2016	1178.44	448.99	04/08/2015	0.01	442.61	27/05/2016
2016-2017	950	448.05	07/08/2016	0	442.66	29/05/2017
2017-2018	316.9	446.05	09/08/2017	0	442.63	17/06/2017

Stage Discharge Sheet for Narmada at Manot for the period 2017-18

Day	June		July		August		September		October		November	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	0	442.66	21.16	443.54	91.27	444.05	153.09	444.55	50	443.84	18.43	443.54
2	0	442.65	25	443.68	92.65	444.1	151	444.52	50	443.85	18.37	443.54
3	0	442.65	21.04	443.53	68.35	443.97	102.2	444.26	42.6	443.81	18.14	443.53
4	0	442.66	93.7	444.03	59.73	443.9	92.92	444.1	40.09	443.79	18	443.53
5	0	442.67	50.09	443.87	47.39	443.86	90.11	444.05	38.13	443.77	18	443.53
6	0	442.66	24.79	443.63	44	443.83	88.41	444.01	35.7	443.75	17.92	443.52
7	0	442.67	22.26	443.56	41.95	443.8	88.85	444.02	33.93	443.72	17.85	443.52
8	0	442.66	20.7	443.52	106.3	444.26	93.17	444.12	52	443.87	17.64	443.51
9	0	442.66	18	443.46	316.9	446.05	89.98	444.04	39.79	443.79	17.46	443.5
10	0	442.65	16.52	443.44	267.5	445.4	99	444.15	48.03	443.86	17.34	443.5
11	0	442.68	23.98	443.58	299.8	445.71	152.3	444.53	43.47	443.81	17.05	443.48
12	0	442.67	43.89	443.81	160.2	444.69	102.9	444.25	42.28	443.8	16.9	443.46
13	0	442.66	106.18	444.2	135	444.41	155.8	444.56	41.5	443.78	16.41	443.44
14	0	442.66	100.84	444.11	130.2	444.31	134.7	444.4	36.5	443.75	16.27	443.43
15	0	442.65	92.14	444	100	444.25	133.8	444.36	35	443.73	16.14	443.42
16	0	442.64	90	444.12	97.25	444.14	108.5	444.27	34.36	443.72	15.8	443.4
17	0	442.63	278.73	445.46	91.12	444.05	109	444.29	24.06	443.68	15.7	443.39
18	0	442.63	308.47	445.7	87.39	444	132	444.35	23.71	443.66	15.6	443.38
19	0	442.64	259.39	445.16	101.4	444.19	101.4	444.2	22	443.62	15.4	443.37
20	0	442.65	242.04	445.05	95	444.11	135.8	444.42	21.09	443.59	15.14	443.36
21	0	442.66	272.67	445.36	109.1	444.28	157.7	444.59	20.62	443.58	14.94	443.35
22	0	442.66	288.39	445.48	88.23	444.01	205.8	444.84	20.5	443.58	14.75	443.34
23	0	442.65	220	445.94	90.74	444.05	149	444.49	20.72	443.59	14.65	443.33
24	0	442.64	173.8	444.77	68.37	443.97	128	444.3	19.95	443.58	14.55	443.32
25	0	442.65	160.56	444.6	155	444.7	100.5	444.18	19.8	443.57	14.5	443.31
26	0	442.64	159.46	444.54	240	445.12	94.14	444.09	19.64	443.57	14.4	443.3
27	0	442.65	133.59	444.3	156	444.72	88.75	444.04	19.22	443.56	13.76	443.28
28	0	442.65	253.68	445.1	154.1	444.55	87.2	444	19.09	443.56	13.5	443.27
29	0	442.65	159.65	444.59	150.4	444.5	62.83	443.94	18.95	443.55	13.16	443.25
30	0	442.65	120	444.34	134	444.38	57	443.89	18.82	443.55	13.08	443.25
31			103.72	444.15	226.4	444.94			18.69	443.55		
Ten-Daily Mean												
I Ten-Daily	0	442.66	31.33	443.63	113.6	444.32	104.87	444.18	43.03	443.8	17.92	443.52
II Ten-Daily	0	442.65	154.56	444.52	129.74	444.39	126.62	444.36	32.4	443.71	16.04	443.41
III Ten-Daily	0	442.65	185.96	444.83	142.94	444.47	113.09	444.24	19.64	443.57	14.13	443.3
Monthly												
Min.	0	442.63	16.52	443.44	41.95	443.8	57	443.89	18.69	443.55	13.08	443.25
Max.	0	442.68	308.47	445.94	316.9	446.05	205.8	444.84	52	443.87	18.43	443.54
Mean	0	442.65	123.95	444.33	128.76	444.39	114.86	444.26	31.69	443.7	16.03	443.41

Annual Runoff in MCM : 1245.16

Peak Observed Discharge = 316.9 cumecs on 9/8/2017 Corres. Water Level 446.05 m

Lowest Observed Discharge = 0cumecs on 17/6/2017 Corres. Water Level 442.63 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge #:Discarded Discharge (values changed as per rating curve)

Note:Missing values ignored while arriving at Annual Runoff

Stage Discharge Sheet for Narmada at Manot for the period 2017-18

Day	December		January		February		March		April		May	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	12.94	443.24	11.26	443.16	9.98	443.13	11.66	443.16	6.88	442.92	5.2	442.84
2	12.85	443.23	11.17	443.16	9.91	443.13	11.5	443.15	6.8	442.91	4.85	442.83
3	12.75	443.22	10.96	443.15	9.85	443.13	11.4	443.14	6.75	442.91	4.85	442.83
4	12.61	443.21	10.86	443.15	9.8	443.13	11.3	443.13	6.68	442.9	4.62	442.82
5	12.5	443.2	10.67	443.15	9.69	443.12	11.2	443.12	6.6	442.89	4.62	442.82
6	12.4	443.19	10.57	443.14	9.64	443.12	11.2	443.12	6.6	442.89	4.3	442.81
7	12.35	443.19	10.5	443.14	9.59	443.12	11.15	443.11	6.45	442.88	3.95	442.8
8	12.09	443.18	10.27	443.13	9.45	443.11	11.08	443.11	6.45	442.88	3.6	442.79
9	12.01	443.18	10.2	443.13	9.4	443.11	10.95	443.1	6.3	442.87	3.2	442.78
10	11.9	443.17	10.15	443.13	9.35	443.11	10.78	443.09	6.3	442.87	2.8	442.77
11	11.9	443.17	10.08	443.13	9.31	443.11	10.6	443.08	6.15	442.86	2.5	442.76
12	11.8	443.16	10.01	443.13	9.27	443.11	10.34	443.07	6.15	442.86	2.2	442.75
13	11.8	443.16	9.95	443.13	9.57	443.12	10.18	443.06	5.95	442.85	1.9	442.74
14	11.75	443.16	9.9	443.13	11.8	443.15	10.02	443.05	5.95	442.85	1.6	442.73
15	11.75	443.16	9.79	443.12	12.04	443.18	9.77	443.04	5.95	442.85	1.3	442.72
16	11.9	443.17	9.71	443.12	12.32	443.2	9.52	443.03	6.1	442.86	0.99	442.71
17	12.05	443.18	9.66	443.12	12.57	443.21	9.31	443.02	6.65	442.9	0.68	442.7
18	12.57	443.21	9.6	443.12	12.6	443.21	9.18	443.01	6.65	442.9	0.36	442.69
19	12.76	443.22	9.54	443.12	12.91	443.22	8.93	443	6.4	442.89	0	442.68
20	12.69	443.22	9.47	443.12	12.98	443.22	8.7	442.99	6.4	442.89	0	442.67
21	12.51	443.21	9.44	443.12	12.54	443.21	8.51	442.98	6.15	442.88	0	442.66
22	12.46	443.21	9.33	443.11	12.28	443.2	8.3	442.97	6.15	442.88	0	445.65
23	12.28	443.2	9.27	443.11	12.16	443.19	8.09	442.96	6.15	442.88	0	442.65
24	12.2	443.19	9.22	443.11	12.11	443.19	7.98	442.96	5.9	442.87	0	442.64
25	12.15	443.19	9.17	443.11	12.05	443.19	7.88	442.95	5.9	442.87	0	442.64
26	11.95	443.18	9.13	443.11	11.97	443.18	7.68	442.95	5.75	442.86	8.86	443.1
27	11.87	443.18	9.07	443.11	11.85	443.17	7.46	442.94	5.75	442.85	12.95	443.25
28	11.8	443.17	9.02	443.11	11.72	443.16	7.36	442.94	5.5	442.85	15.2	443.38
29	11.61	443.17	8.94	443.1			7.25	442.93	5.5	442.85	16.25	443.44
30	11.55	443.17	8.86	443.1			7.13	442.93	5.2	442.84	15.5	443.4
31	11.45	443.17	8.82	443.1			6.9	442.92			12.2	443.2
Ten-Daily Mean												
I Ten-Daily	12.44	443.2	10.66	443.14	9.67	443.12	11.22	443.12	6.58	442.89	4.2	442.81
II Ten-Daily	12.1	443.18	9.77	443.12	11.54	443.17	9.65	443.03	6.23	442.87	1.15	442.72
III Ten-Daily	11.98	443.19	9.12	443.11	12.08	443.19	7.69	442.95	5.8	442.86	7.36	443.27
Monthly												
Min.	11.45	443.16	8.82	443.1	9.27	443.11	6.9	442.92	5.2	442.84	0	442.64
Max.	12.94	443.24	11.26	443.16	12.98	443.22	11.66	443.16	6.88	442.92	16.25	445.65
Mean	12.17	443.19	9.85	443.13	11.1	443.16	9.52	443.04	6.2	442.88	4.24	442.93

Annual Runoff in mm : 266.8

Peak Computed Discharge = 220 cumecs on 23/7/2017 Corres. Water Level 445.94 m

Lowest Computed Discharge = 0.36cumecs on 18/5/2018 Corres. Water Level 442.69 m

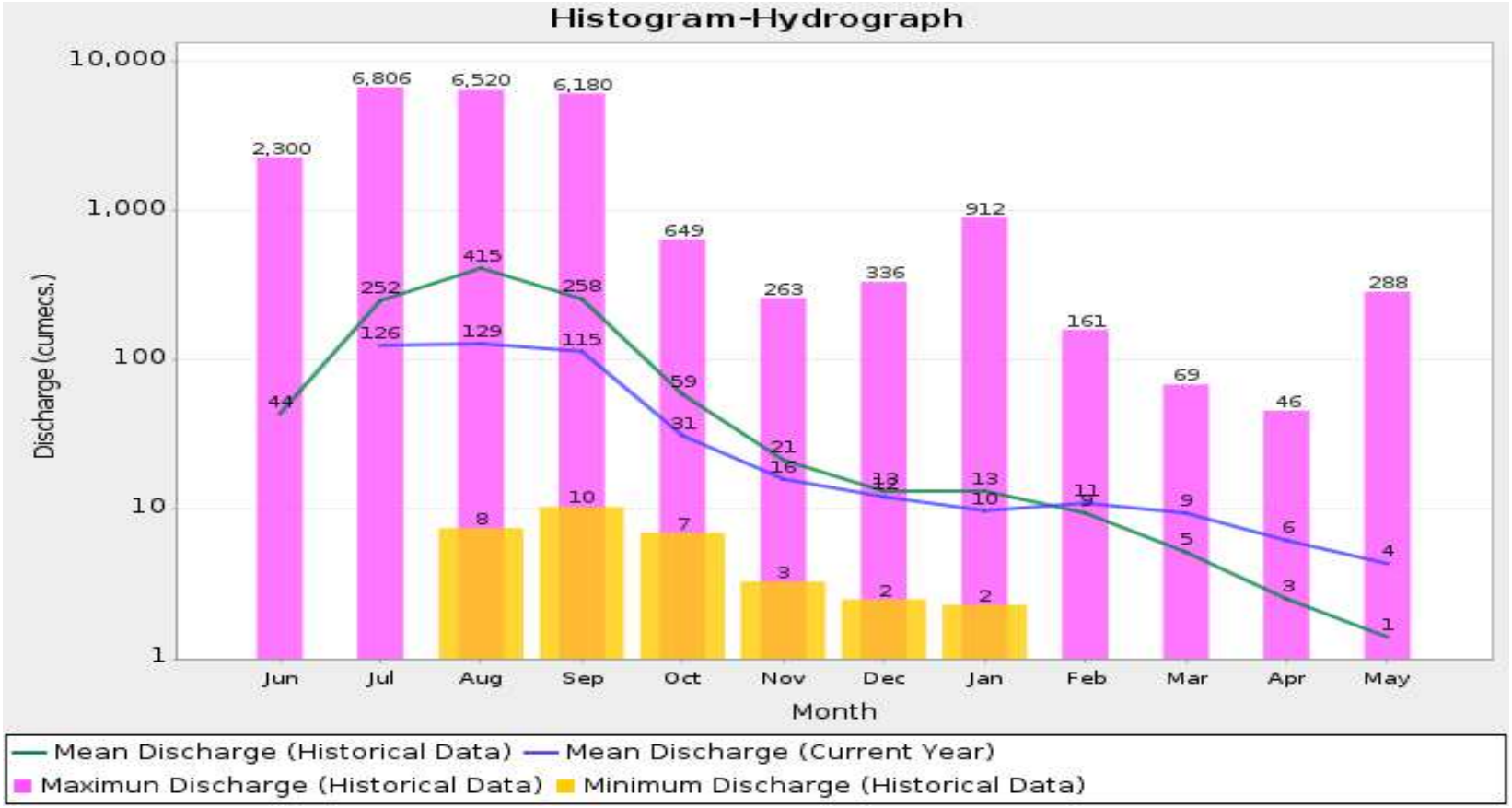
Histogram- Hydrograph for Water Year : 2017-18 (Data considered : 1977-2018)

Station Name : Narmada at Manot (010215002)

Division : Narmada Division, Bhopal

Local River : Narmada

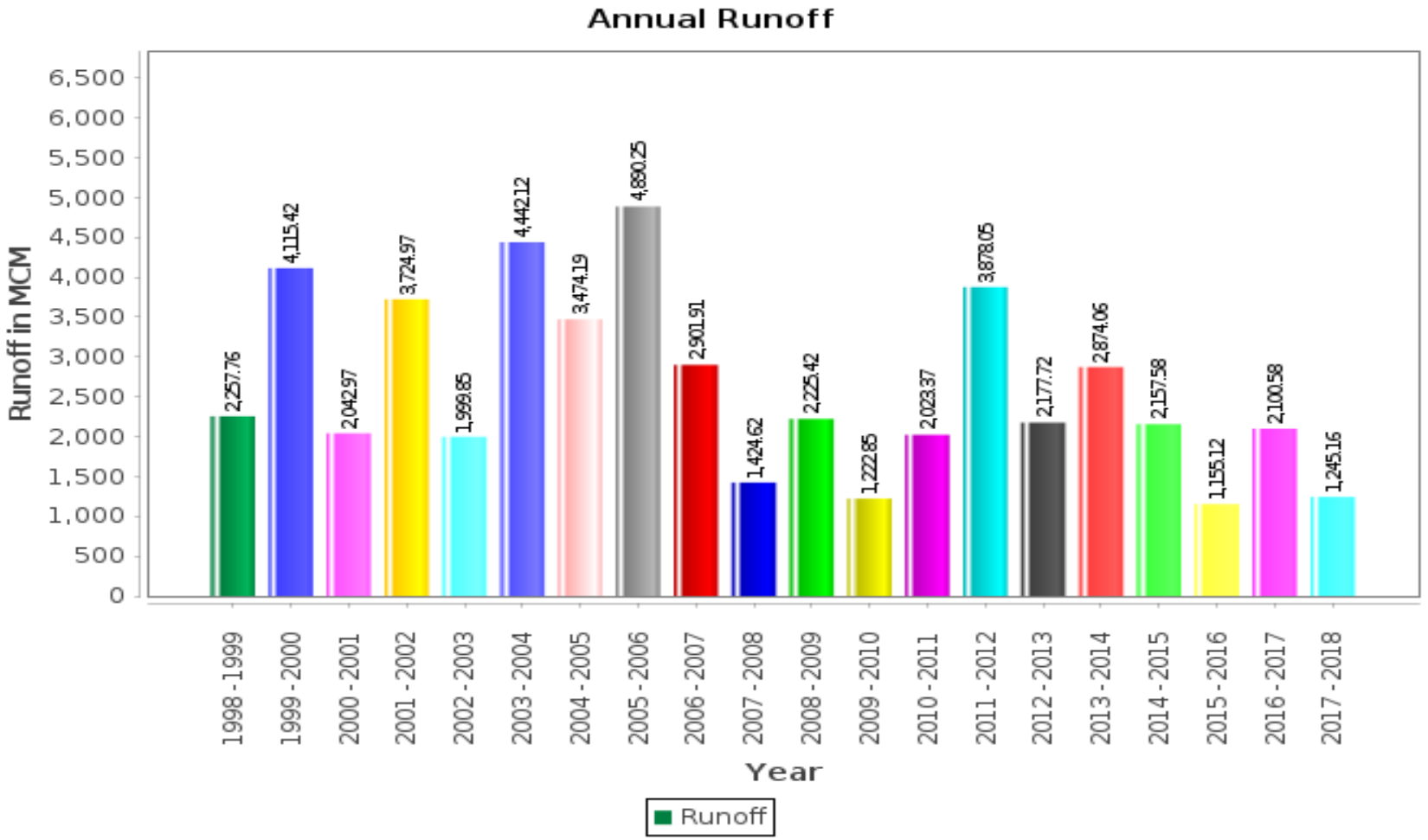
Sub-Division : UNSD, CWC Jabalpur



Annual Runoff Values for the period (1977– 2018)

Station Name : Narmada at Manot (010215002) Division : Narmada Division, Bhopal

Local River : Na Sub-Division : UNSD, CWC Jabalpur

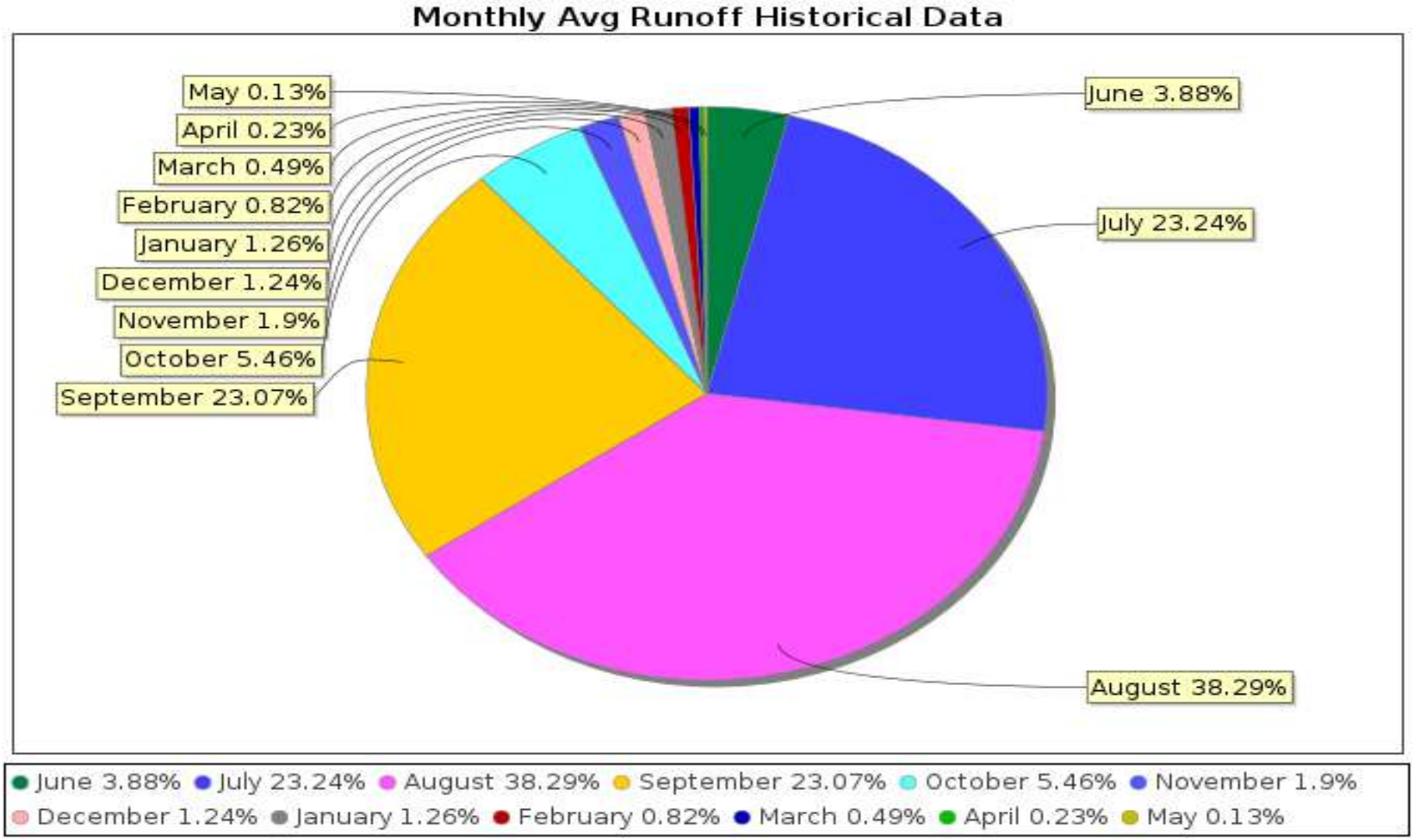


Note: Missing values have not been considered while arriving at Annual Runoff

Monthly Average Runoff based on period (1977-2018)

Station Name : Narmada at Manot (010215002) Division : Narmada Division, Bhopal

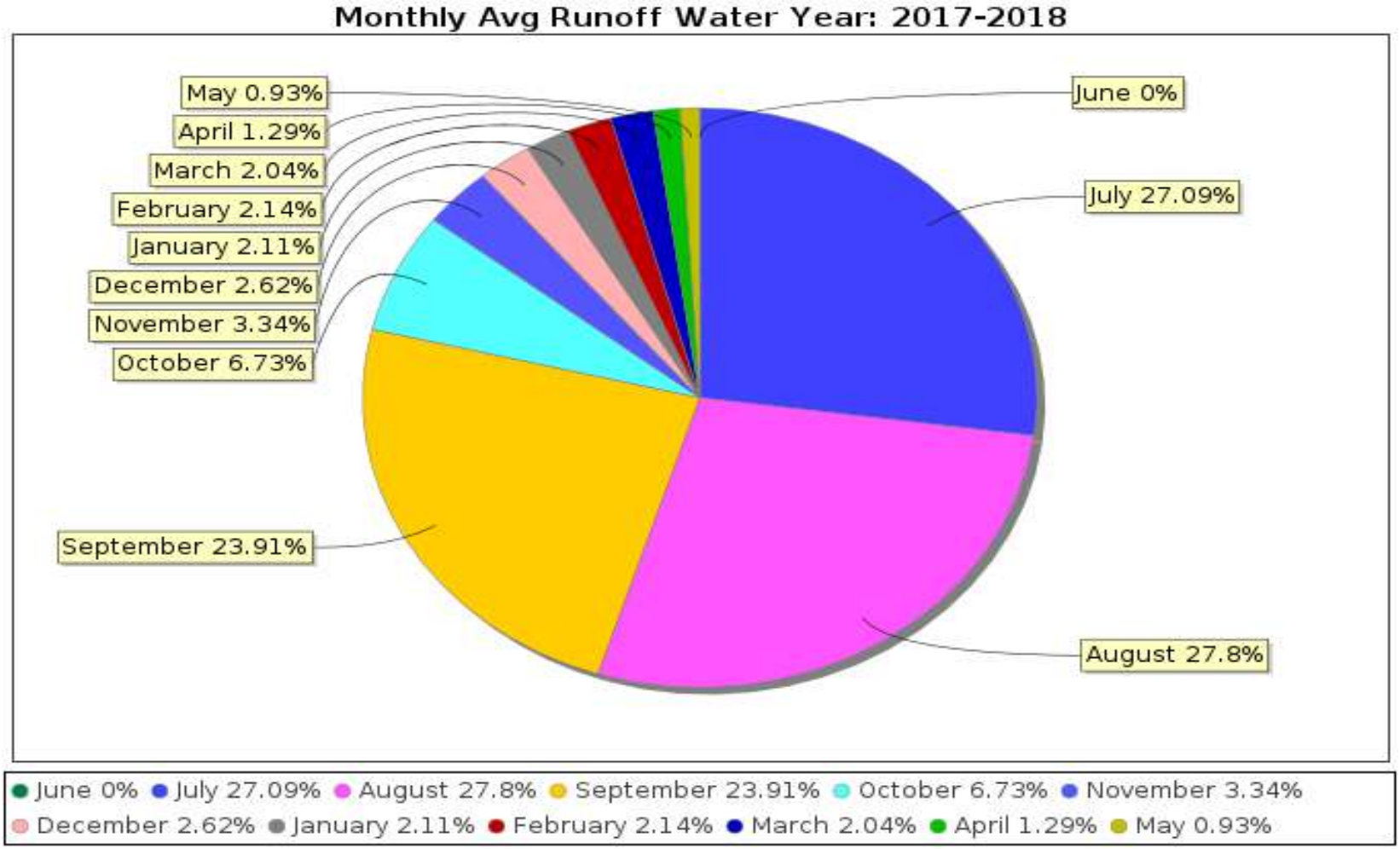
Local River : Narmada Sub-Division : UNSD, CWC Jabalpur



Monthly Runoff for the Year (2017-18)

Station Name : Narmada at Manot (010215002) Division : Narmada Division, Bhopal

Local River : Narmada Sub-Division : UNSD, CWC Jabalpur



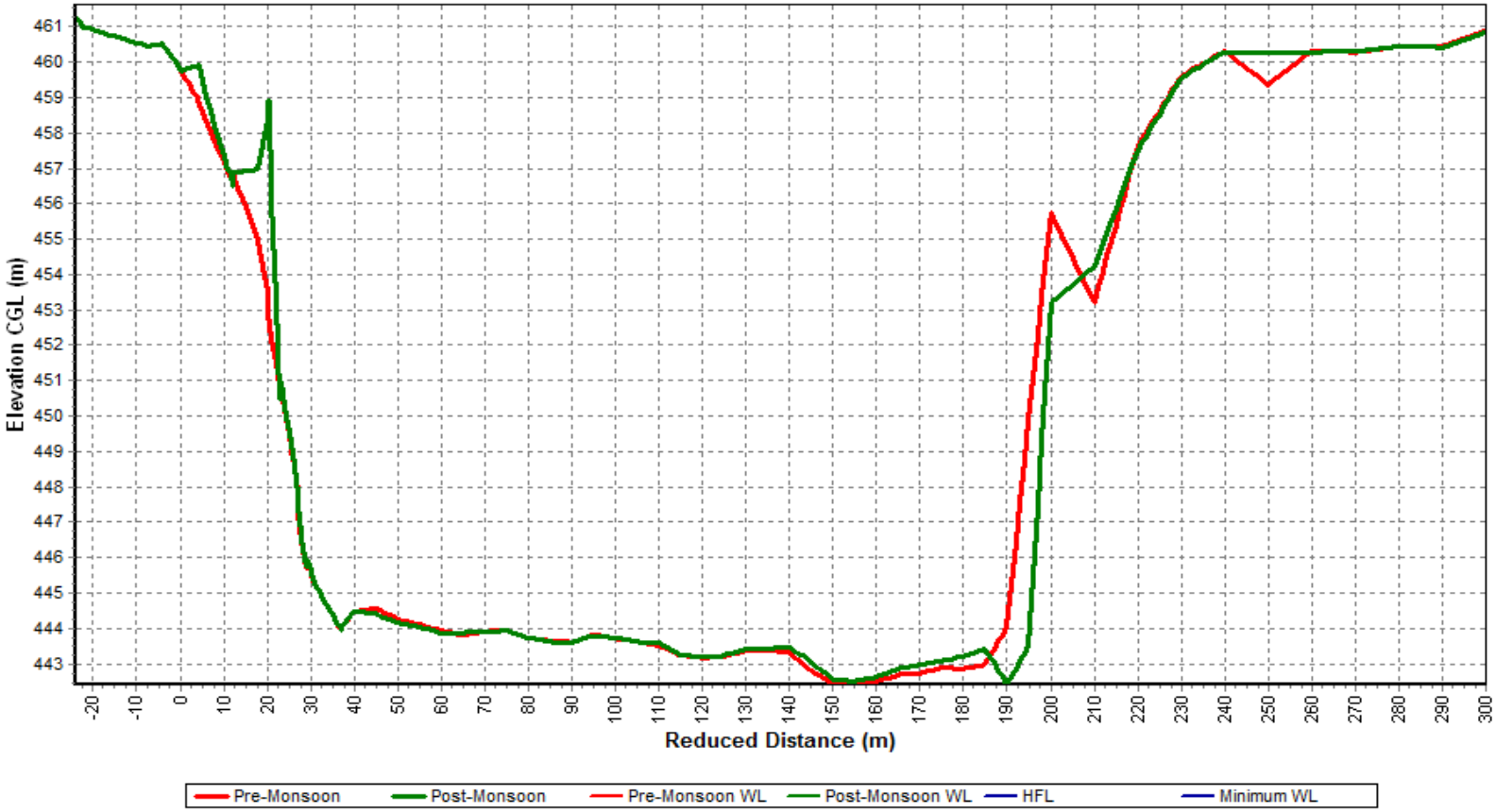
Pre-Monsoon & Post-Monsoon X-Section for Water Year (2017-18)

Station Name : Narmada at Manot (010215002)

Division : Narmada Division, Bhopal

Local River : Narmada

Sub-Division : UNSD, CWC Jabalpur



4.16 Narmada at Dindori

History Sheet

HISTORY SHEET (DISCHARGE AND WATER LEVEL)

			Water Year	:	2017 - 2018
Site	:	Dindori	**Code**	:	008-NDBHP
State	:	Madhya Pradesh	**District**	:	Mandla
Basin	:	NARMADA	**Independent River**	:	Narmada
Tributary	:	-	**Sub Tributary**	:	-
Sub-Sub Tributary	:	-	**Local River**	:	Narmada
Division	:	Narmada Division(ND), Bhopal	**Sub-Division**	:	Upper Narmada Sub-Division, Jabalpur
Drainage Area	:	2292.0 Sq. Km.	**Bank**	:	
Latitude	:	22°56'52''	**Longitude**	:	81°4'33''
Current Zero of Gauge (m)	:	660			

CATEGORY		Opening Date	Closing Date
Gauge	:		
Discharge	:		
Sediment	:		
Water Quality	:		

Reduced Level	Opening Date	Closing Date
660.0	08/06/2014	-
660.0	26/06/1998	08/06/2014
660.0	26/06/1988	26/06/1998

Annual Maximum / Minimum discharge with corresponding Water Level (m.s.l)

	Maximum			Minimum		
Year	Q (cumecs)	WL (m)	Date	Q (cumecs)	WL (m)	Date
1972-1973	0	0	17/06/1972	0	0	17/06/1972
1988-1989	2649	669	02/08/1988	0	0	01/06/1988
1989-1990	875	665.55	13/08/1989	0.84	662.555	01/06/1989
1990-1991	2250	667.5	05/09/1990	1	662.56	19/05/1991
1991-1992	4710	669.64	23/08/1991	1.15	662.585	20/05/1992
1992-1993	3080	668.5	11/09/1992	0.5	662.57	10/05/1993
1993-1994	2560	667.9	27/09/1993	0.3	662.595	05/06/1993
1994-1995	4350	669.45	20/07/1994	0.9	662.55	20/05/1995
1995-1996	1865	667.17	08/08/1995	0.88	662.545	12/06/1995
1996-1997	1515	666.7	01/08/1996	1.03	662.555	06/06/1996
1997-1998	1085	666.11	29/07/1997	1.28	662.595	07/06/1997
1998-1999	1300	666.42	05/07/1998	1.28	662.575	12/05/1999
1999-2000	3907	669.3	31/08/1999	1.09	662.57	31/05/2000
2000-2001	980	666.25	19/07/2000	0.48	662.54	15/05/2001
2001-2002	2290	667.02	30/06/2001	0.81	662.54	24/05/2002
2002-2003	1130	666.12	24/06/2002	0.5	662.53	20/05/2003
2003-2004	2400	668	29/08/2003	0.5	662.52	11/06/2003
2004-2005	1600	667	08/08/2004	0.9	662.53	29/05/2005
2005-2006	1305.69	666.55	22/08/2005	0.3	662.505	21/05/2006
2006-2007	1881.53	667.7	31/07/2006	0.3	662.55	14/05/2007
2007-2008	347.62	664.23	21/08/2007	0.41	662.51	20/05/2008
2008-2009	1253.94	667	19/09/2008	0.71	662.48	30/04/2009
2009-2010	772.39	665.75	15/08/2009	5.01	663.52	25/08/2009
2010-2011	490.12	665.4	03/08/2010	5.34	662.64	06/02/2011
2011-2012	1044.09	666.44	12/08/2011	0	663.06	24/10/2011
2012-2013	570.48	665.5	11/08/2012	0.66	662.83	23/05/2013
2013-2014	844.63	665.75	09/08/2013	0.8	662.85	04/06/2013
2014-2015	1922.22	667.1	14/10/2014	0.73	662.51	26/05/2015
2015-2016	908.88	666.13	23/06/2015	0.61	662.56	10/05/2016
2016-2017	1211.84	664.3	28/08/2016	1.51	662.6	13/05/2017
2017-2018	920.2	666.65	10/08/2017	0.26	662.21	11/05/2018

Stage Discharge Sheet for Narmada at Dindori for the period 2017-18

Day	June		July		August		September		October		November	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	2.07	662.73	46.58	663.92	7.19	662.94	125.02	664.37	16.01	663.28	6.73	662.69
2	2.04	662.69	8.55	663.25	10.25	663.17	79.27	664.08	15.08	663.23	7	662.68
3	2.24	662.7	15.36	663.37	10.25	662.95	55.52	663.93	13.58	663.15	6.87	662.67
4	1.94	662.69	34.19	663.8	8.71	662.76	42.85	663.85	11.02	663.08	6.83	662.66
5	2.21	662.69	14.17	663.29	7.73	662.74	37.83	663.8	10.81	663.04	6.82	662.66
6	1.92	662.68	15.16	663.37	7.56	662.72	44.35	663.86	11.34	663.21	6.8	662.66
7	1.9	662.68	12.96	663.17	10.01	663.01	47.06	663.91	10.81	663.2	6.66	662.66
8	1.91	662.68	2.36	662.48	304.7	664.91	38.65	663.82	28.01	663.65	7.23	662.73
9	1.89	662.68	2.62	662.79	173.9	664.5	44.45	663.85	14.25	663.29	8.99	662.86
10	1.88	662.68	2.54	662.7	920.2	666.65	100.7	664.19	12.81	663.25	10.32	663
11	1.72	662.68	2.51	662.7	138.7	664.41	85.81	664.1	11.47	663.12	10.14	663
12	1.56	662.68	3.45	662.91	87.05	664.13	59.49	663.98	10.99	663.05	10.01	663
13	1.91	662.68	10.59	663.05	63.16	663.99	77.67	664.08	10.06	663	9.89	662.99
14	1.81	662.69	3.96	662.9	52.92	663.92	85.77	664.1	10.12	662.97	9.43	662.98
15	1.81	662.68	9.61	663	42.32	663.83	76.5	664.08	9.74	662.94	9.25	662.93
16	1.69	662.68	9.59	663.04	22.18	663.64	77.56	664.08	8.98	662.88	8.91	662.93
17	1.59	662.68	53.31	663.89	14.25	663.29	57.99	663.98	8.8	662.86	8.96	662.93
18	1.56	662.68	45.54	663.84	26.36	663.69	48.21	663.93	9.33	662.85	8.7	662.93
19	1.54	662.68	97.33	664.27	51.55	663.91	94.76	664.2	9.22	662.84	8.61	662.93
20	1.52	662.68	130.4	664.38	51.12	663.96	60.1	663.99	9.12	662.83	8.52	662.93
21	1.6	662.6	176.8	664.53	51.72	663.89	128.4	664.35	8.81	662.82	7.95	662.92
22	1.56	662.68	95.75	664.2	44.88	663.87	91.34	664.19	8.44	662.81	8	662.92
23	1.54	662.68	53.48	663.85	20.34	663.57	71.2	664.04	8.08	662.8	7.92	662.92
24	1.49	662.68	20.87	663.58	182.3	664.63	53.59	663.93	8.04	662.79	5.32	662.9
25	1.48	662.68	30.28	663.75	137.2	664.41	43.99	663.87	7.96	662.78	5.27	662.89
26	1.47	662.68	16.47	663.35	119.6	664.34	43.39	663.85	7.91	662.76	5.28	662.89
27	1.46	662.68	12.03	663.22	144.2	664.42	35.82	663.8	7.66	662.74	5.3	662.89
28	2.68	662.78	15.48	663.31	98.07	664.27	19.39	663.5	7.49	662.73	5.03	662.87
29	21.8	663.41	11.24	663.21	86.95	664.11	17.14	663.34	7.28	662.72	4.97	662.87
30	35.15	663.81	10.67	663.15	191.1	664.66	19.2	663.45	7.06	662.71	4.95	662.87
31			9.44	663.02	129.6	664.38			6.94	662.7		
Ten-Daily Mean												
I Ten-Daily	2	662.69	15.45	663.21	146.05	663.63	61.57	663.97	14.37	663.24	7.43	662.73
II Ten-Daily	1.67	662.68	36.63	663.4	54.96	663.88	72.39	664.05	9.78	662.93	9.24	662.95
III Ten-Daily	7.02	662.87	41.14	663.56	109.63	664.23	52.35	663.83	7.79	662.76	6	662.89
Monthly												
Min.	1.46	662.6	2.36	662.48	7.19	662.72	17.14	663.34	6.94	662.7	4.95	662.66
Max.	35.15	663.81	176.8	664.53	920.2	666.65	128.4	664.37	28.01	663.65	10.32	663
Mean	3.56	662.75	31.07	663.39	103.55	663.91	62.1	663.95	10.65	662.98	7.56	662.86

Annual Runoff in MCM : 636.25

Peak Observed Discharge = 920.2 cumecs on 10/8/2017 Corres. Water Level 666.65 m

Lowest Observed Discharge = 0.26cumecs on 11/5/2018 Corres. Water Level 662.21 m

Stage Discharge Sheet for Narmada at Dindori for the period 2017-18

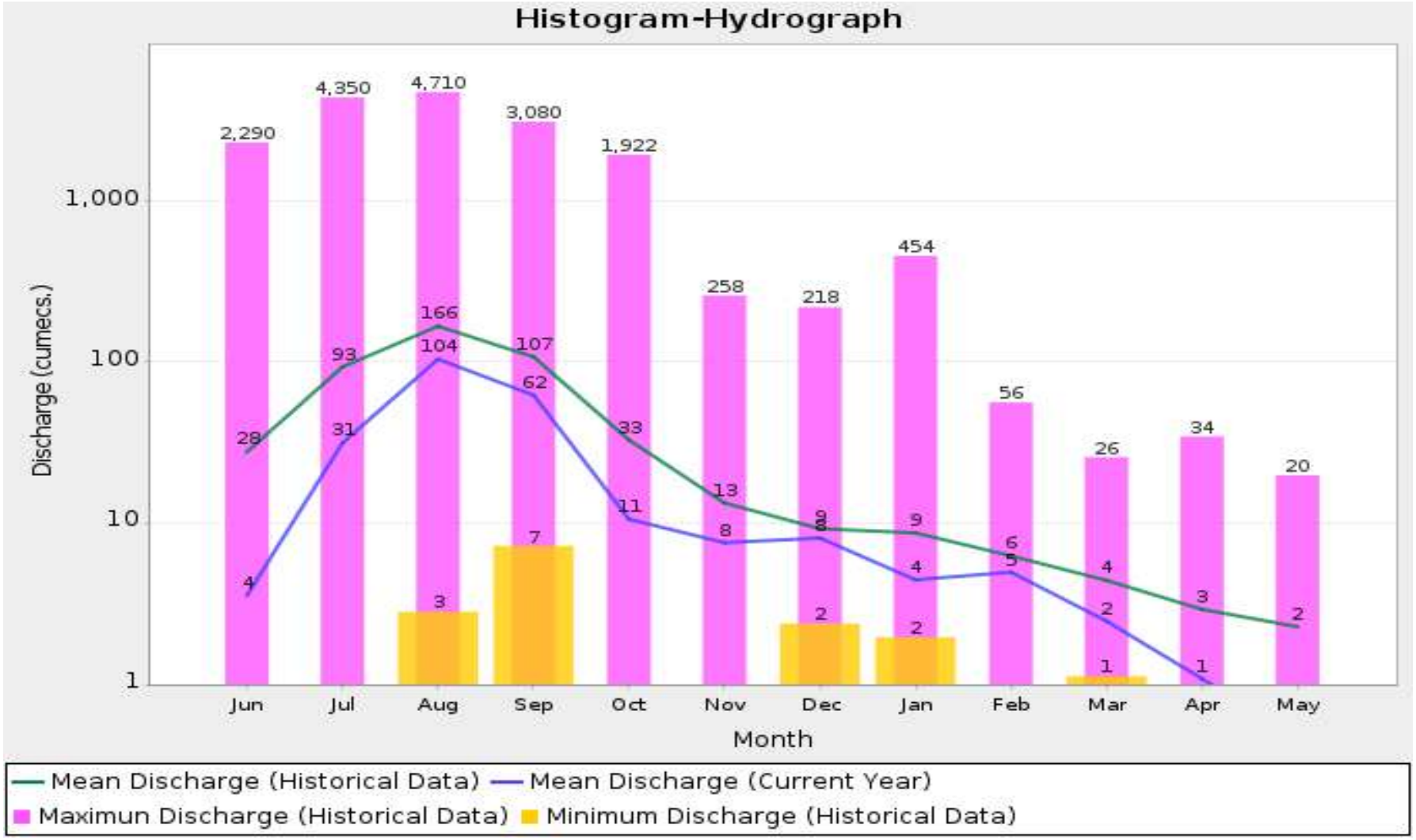
Day	December		January		February		March		April		May	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	4.91	662.87	6.86	662.86	6.51	662.98	3.85	662.93	1.38	662.89	0.81	662.82
2	4.89	662.87	6.52	662.86	6.18	663.13	3.78	662.93	1.35	662.89	0.83	662.82
3	4.88	662.87	6.52	662.86	5.96	663.03	3.72	662.93	1.36	662.89	0.78	662.8
4	4.87	662.87	6.04	662.86	5.34	663	3.66	662.93	1.3	662.88	0.77	662.8
5	8.56	662.95	5.99	662.86	4.72	663	3.61	662.93	1.19	662.86	0.76	662.8
6	10.21	663.02	5.12	662.83	5.32	663	3.62	662.93	1.16	662.86	0.52	662.78
7	10.15	663.02	5.05	662.83	5.26	663	3.53	662.93	1.14	662.86	0.28	662.76
8	10.02	663.02	4.97	662.82	5.24	663	3.34	662.93	1.14	662.85	0.32	662.76
9	9.96	663.02	4.9	662.82	4.96	663	3.41	662.93	1.15	662.85	0.28	662.76
10	9.92	663.02	4.68	662.8	4.97	662.98	3.36	662.93	1.12	662.85	0.26	662.51
11	9.89	663.02	4.89	662.8	4.91	662.98	3.08	662.93	1.11	662.85	0.26	662.21
12	9.64	663.02	4.92	662.8	4.84	662.98	2.8	662.93	1.1	662.85	0.26	662.14
13	9.95	663.02	4.8	662.8	4.94	662.98	2.66	662.93	1.1	662.85	0.29	662.17
14	9.26	663.01	4.71	662.8	4.89	662.98	2.65	662.93	1.09	662.85	0.32	662.2
15	9.55	663.01	4.63	662.8	4.84	662.98	2.57	662.93	1.09	662.85	0.36	662.28
16	9.63	663.01	4.16	662.8	4.84	662.97	2.56	662.93	1.09	662.85	0.46	662.35
17	9.59	663.01	3.8	662.8	4.82	662.97	2.46	662.91	1	662.85	0.49	662.45
18	9.55	663.01	3.5	662.79	4.82	662.97	2.12	662.9	1.05	662.84	0.56	662.53
19	9.46	663.01	3.81	662.79	4.81	662.97	1.79	662.89	1	662.84	0.56	662.55
20	9.25	663.01	3.79	662.79	4.8	662.97	1.69	662.89	0.99	662.84	0.62	662.6
21	9.04	663	3.72	662.79	4.8	662.97	1.55	662.89	1	662.84	0.68	662.6
22	8.91	663	3.65	662.79	4.63	662.97	1.52	662.89	1.02	662.84	0.66	662.6
23	9.02	663	3.79	662.79	4.48	662.97	1.49	662.89	1.04	662.84	0.62	662
24	7.94	662.99	3.38	662.78	4.54	662.97	1.48	662.89	0.95	662.84	0.62	662.59
	7.4	662.98	3.38	662.78	4.5	662.97	1.48	662.89	0.99	662.84	0.39	662.58
25	6.86	662.97	3.38	662.78	4.47	662.97	1.47	662.89	0.98	662.84	0.38	662.57
26	6.57	662.97	3.39	662.78	4.46	662.97	1.49	662.89	0.9	662.84	0.38	662.57
27	6.34	662.97	3.4	662.78	3.94	662.93	1.46	662.89	0.9	662.84	0.37	662.56
28	4.31	662.87	3.4	662.78			1.44	662.89	0.9	662.84	0.36	662.55
29	4.14	662.85	3.37	662.78			1.43	662.89	0.9	662.84	0.32	662.55
30	5.5	662.86	3.39	662.78			1.42	662.89			0.31	662.55
31												
Ten-Daily Mean	7.84	662.95	5.67	662.84	5.45	663.01	3.59	662.93	1.23	662.87	0.56	662.76
I Ten-Daily	9.58	663.01	4.3	662.8	4.85	662.97	2.44	662.92	1.06	662.85	0.42	662.35
II Ten-Daily	6.91	662.95	3.48	662.78	4.48	662.96	1.47	662.89	0.96	662.84	0.46	662.52
III Ten-Daily												
Monthly	4.14	662.85	3.37	662.78	3.94	662.93	1.42	662.89	0.9	662.84	0.26	662
Min.	10.21	663.02	6.86	662.86	6.51	663.13	3.85	662.93	1.38	662.89	0.83	662.82
Max.	8.11	662.97	4.48	662.81	4.93	662.98	2.5	662.91	1.08	662.85	0.48	662.54
Mean	4.91	662.87	6.86	662.86	6.51	662.98	3.85	662.93	1.38	662.89	0.81	662.82

Annual Runoff in mm : 277.59

Peak Computed Discharge = 144.2 cumecs on 27/8/2017 Corres. Water Level 664.42 m

Lowest Computed Discharge = 0.29cumecs on 13/5/2018 Corres. Water Level 662.17 m

Histogram- Hydrograph for Water Year : 2017-18 (Data considered : 1988-2018)



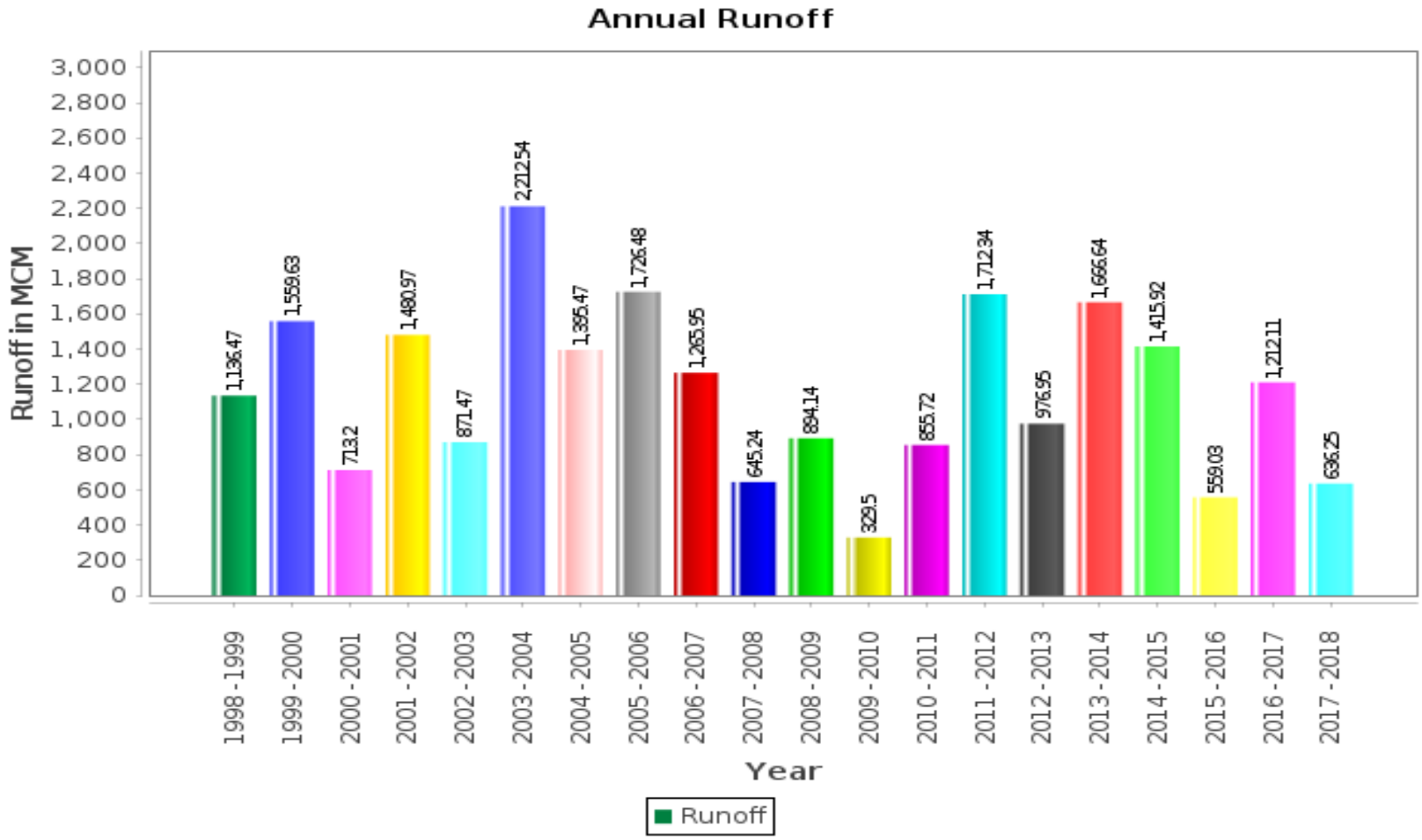
Annual Runoff Values for the period (1988– 2018)

Station Name : Narmada at Dindori (010215001)

Division : Narmada Division, Bhopal

Local River : Narmada

Sub-Division : UNSD, CWC Jabalpur

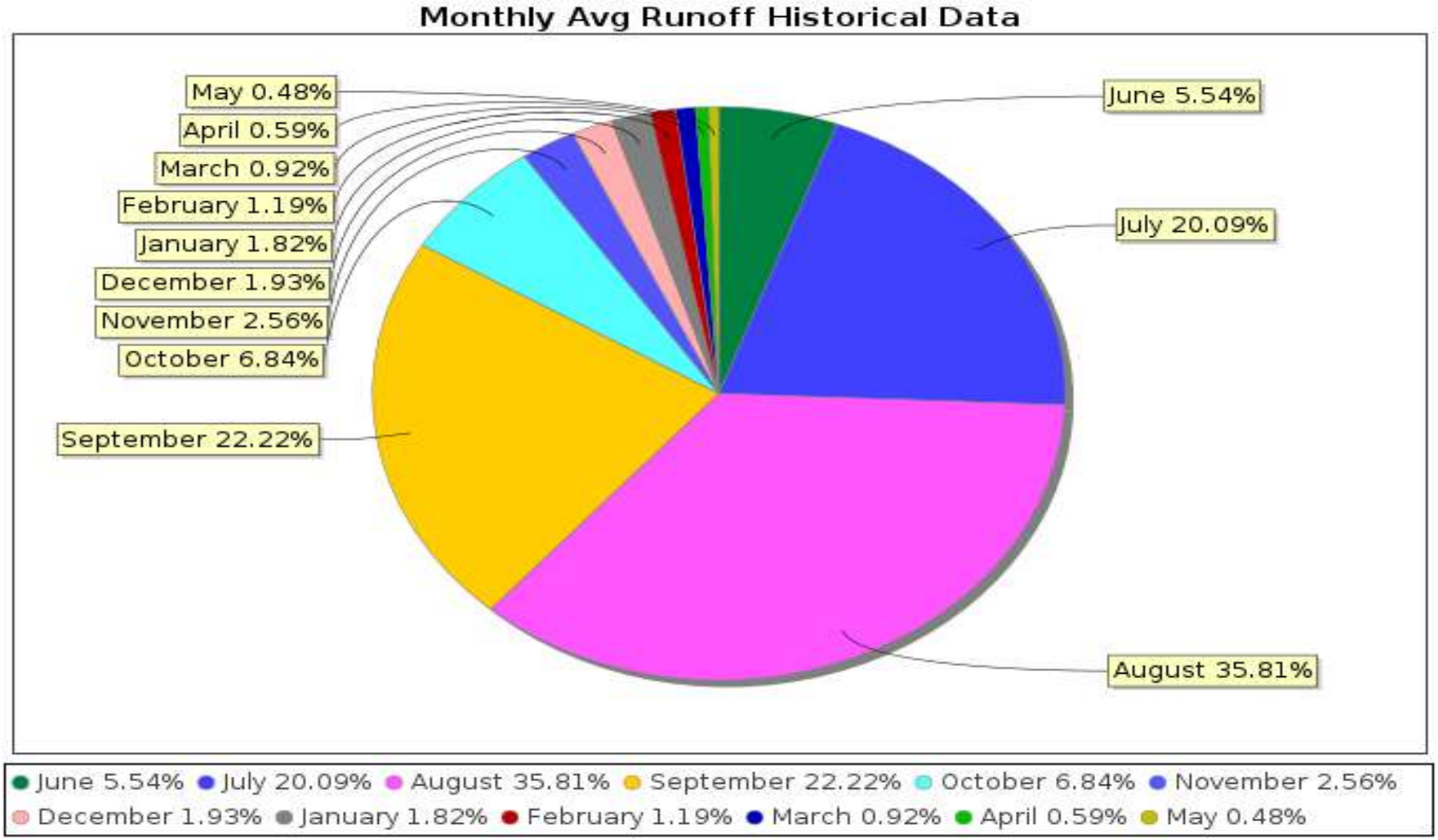


Note: Missing values have not been considered while arriving at Annual Runoff

Monthly Average Runoff based on period (1988-2018)

Station Name : Narmada at Dindori (010215001) Division : Narmada Division, Bhopal

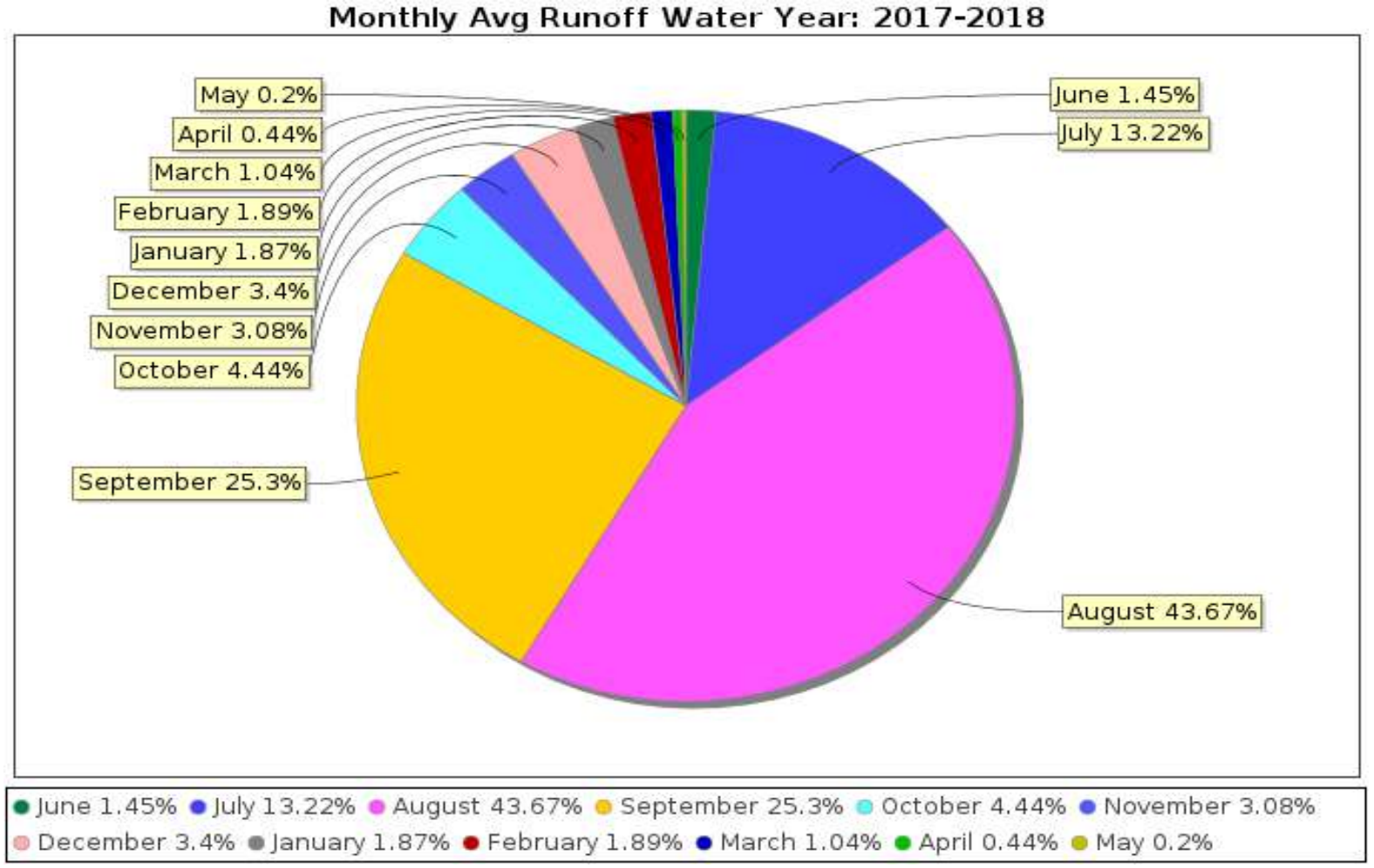
Local River : Narmada Sub-Division : UNSD, CWC Jabalpur



Monthly Runoff for the Year (2017-18)

Station Name : Narmada at Dindori (010215001) Division : Narmada Division, Bhopal

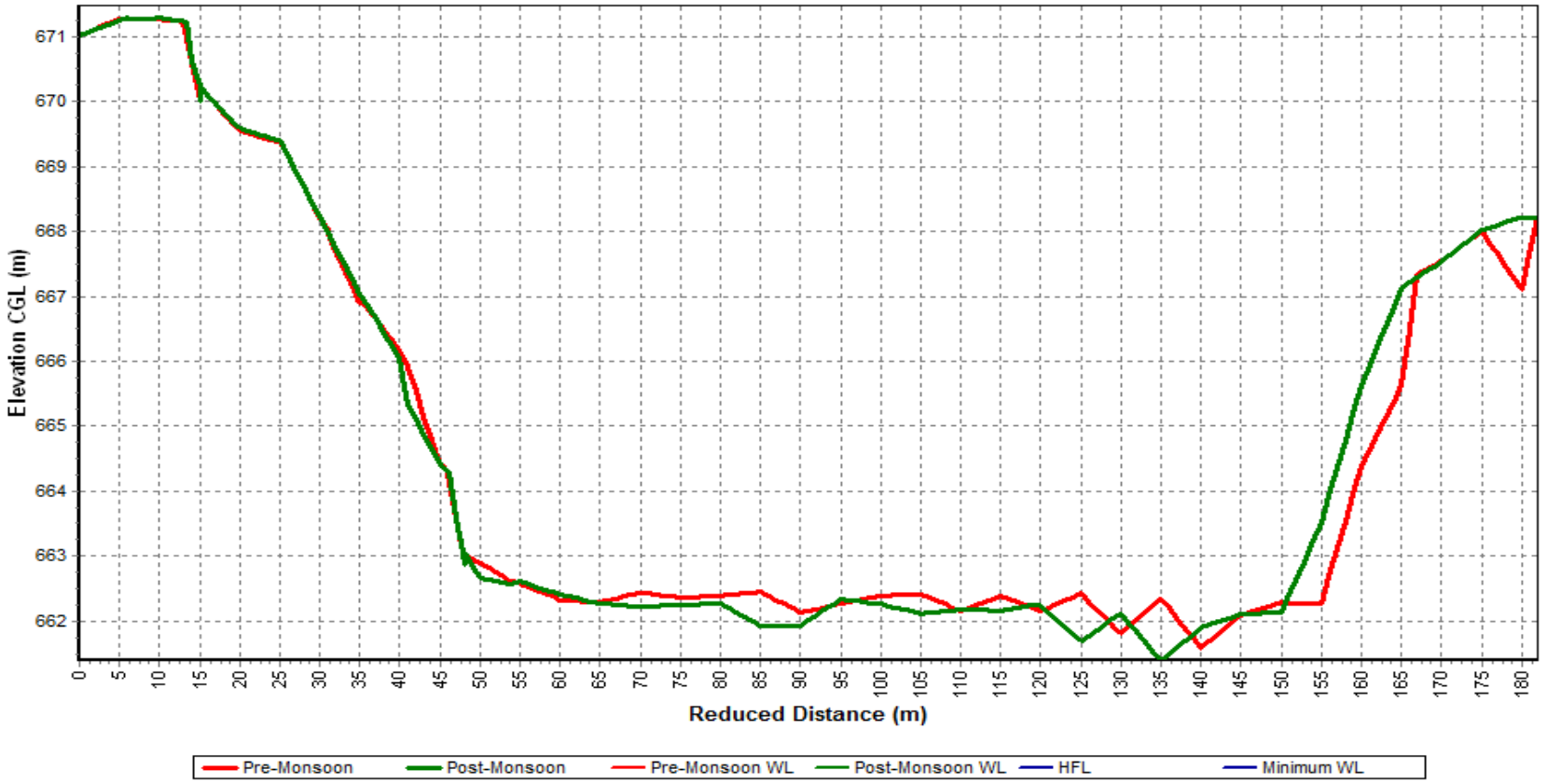
Local River : Narmada Sub-Division : UNSD, CWC Jabalpur



Pre-Monsoon & Post-Monsoon X-Section for Water Year (2017-18)

Station Name : Narmada at Dindori (010215001) Division : Narmada Division, Bhopal

Local River : Narmada Sub-Division : UNSD, CWC Jabalpur



4.17 Narmada at Bijora

History sheet

			Water Year	:	**2017-18**
Site	:	**Narmada at Bijora**	**Code**	:	**NA**
State	:	Madhya Pradesh	District		Jabalpur
Basin	:	Narmada	Independent River	:	Narmada
Tributary	:	-	Sub Tributary	:	
Sub-Sub Tributary	:		Local River	:	Narmada
Division	:	DDPC, Bhopal	Sub-Division	:	SDDPC, Bhopal
Drainage Area	:	14561 Sq. Km.	Bank	:	Left
Latitude	:	22°55'30"	Longitude	:	79°55'30"
Zero of Gauge (m)	:	366 (M.S.L)	01/06/1950		
		Opening Date	Closing Date		
Gauge	:	01/06/1950			
Discharge	:	01/06/1967			
Sediment	:	01/06/1980			
Water Quality	:				

Annual Maximum / Minimum discharge with corresponding Water Level (M.S.L.)

	Maximum			Minimum		
Year	**Q (cumecs)**	**WL (m)**	**Date**	**Q (cumecs)**	**WL (m)**	**Date**
2000-2001	1876	372.400	28/07/2000	0.000		30/01/2001
2001-2002	5776		15/07/2001	0.000		04/04/2002
2002-2003	1680	372.300	11/09/2002	0.000	368.000	08/09/2002
2003-2004	5530	373.800	31/08/2003	0.000	368.000	25/06/2003
2004-2005	4596	375.400	23/08/2004	0.000	368.000	06/10/2004
2005-2006	6845	377.000	07/08/2005	0.000	368.000	31/05/2006
2006-2007	1819	372.200	26/08/2006	0.000	368.000	27/06/2006
2007-2008	234.4	368.000	23/03/2008	0.000	368.000	15/03/2008
2008-2009	209.6	369.700	11/04/2009	4.960	368.000	11/01/2009
2009-2010	1068	368.000	04/10/2009	0.000	368.000	03/09/2009
2010-2011	1491	369.700	22/09/2010	0.000	368.000	26/10/2010
2011-2012	9358	380.500	08/09/2011	0.000	369.000	11/06/2011
2012-2013	3737	374.200	12/08/2012	71.18	368.000	30/07/2012
2013-2014	225.0	369.700	25/09/2013	95.00	369.300	17/09/2013
2014-2015	4480	374.800	07/08/2014	0.000	368.000	21/07/2014
2015-2016	216.0	368.000	26/08/15	10.42	368.000	02/06/15

Stage Discharge Sheet for Narmada at Bijora for the period 2017-18

Day	Jun		Jul		Aug		Sep		Oct		Nov	
	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q
1	369.300	98.99 *	369.300	98.00 *	368.000	97.01 *	368.000	98.99 *	368.000	97.01 *	369.700	197.0 *
2	369.300	98.00 *	369.300	98.00 *	368.000	95.99 *	368.000	102.0 *	368.000	97.01 *	369.700	194.0 *
3	369.300	97.01 *	369.300	98.00 *	368.000	95.00 *	368.000	98.00 *	368.000	95.99 *	368.000	193.0 *
4	369.300	98.00 *	369.300	98.00 *	368.000	101.0 *	368.000	95.00 *	368.000	97.01 *	369.300	191.0 *
5	369.300	95.99 *	369.300	98.00 *	368.000	98.99 *	368.000	95.99 *	368.000	97.01 *	368.000	98.99 *
6	369.300	95.99 *	369.300	98.00 *	368.000	102.0 *	368.000	98.00 *	368.000	98.00 *	368.000	98.99 *
7	369.300	97.01 *	369.300	98.00 *	368.000	98.00 *	368.000	98.00 *	368.000	97.01 *	369.700	191.0 *
8	369.300	98.99 *	369.300	98.00 *	368.000	98.00 *	368.000	98.00 *	368.000	95.99 *	369.700	190.0 *
9	369.300	99.99 *	369.300	98.00 *	368.000	97.01 *	368.000	97.01 *	368.000	95.00 *	369.700	196.0 *
10	369.300	98.00 *	369.300	97.01 *	368.000	98.00 *	368.000	95.99 *	368.000	97.01 *	369.700	188.0 *
11	369.300	98.00 *	369.300	97.01 *	368.000	98.00 *	368.000	95.00 *	368.000	98.00 *	369.300	194.0 *
12	369.300	97.01 *	369.300	95.99 *	368.000	98.00 *	368.000	101.0 *	368.800	70.00 *	369.700	195.0 *
13	369.300	98.00 *	369.300	97.01 *	368.000	97.01 *	368.000	98.99 *	368.800	70.00 *	369.700	194.0 *
14	369.300	98.00 *	369.300	97.01 *	368.000	95.99 *	368.000	98.00 *	368.800	70.00 *	369.700	193.0 *
15	369.300	98.00 *	369.300	98.00 *	368.000	95.00 *	368.000	98.00 *	368.800	166.0 *	369.700	194.0 *
16	369.300	98.00 *	368.000	97.01 *	368.000	101.0 *	368.000	98.00 *	369.300	182.0 *	369.700	192.0 *
17	369.300	100.0 *	368.000	95.99 *	368.000	98.99 *	368.000	98.00 *	369.300	168.0 *	369.700	194.0 *
18	369.300	98.99 *	368.000	95.00 *	368.000	102.0 *	368.000	97.01 *	369.300	193.0 *	368.000	195.0 *
19	369.300	98.00 *	368.000	95.99 *	368.000	98.00 *	368.000	97.01 *	369.700	120.0 *	368.000	195.0 *
20	369.300	98.00 *	368.000	95.00 *	368.000	98.00 *	368.000	101.0 *	368.000	192.0 *	368.000	196.0 *
21	369.300	98.00 *	368.000	101.0 *	368.000	98.00 *	368.000	97.01 *	368.000	120.0 *	368.000	94.01 *
22	369.300	95.00 *	368.000	101.0 *	368.000	98.00 *	368.000	97.01 *	368.000	189.0 *	368.000	75.97 *
23	369.300	95.99 *	369.300	97.01 *	368.000	97.01 *	368.000	97.01 *	369.700	121.1 *	368.000	191.0 *
24	369.300	95.99 *	368.000	98.99 *	368.000	97.01 *	368.000	95.99 *	369.700	100.0 *	368.000	205.0 *
25	369.300	97.01 *	368.000	102.0 *	368.000	101.0 *	368.000	97.01 *	369.300	100.0 *	369.300	190.0 *
26	369.300	98.00 *	368.000	98.00 *	368.000	97.01 *	368.000	97.01 *	368.000	194.0 *	369.700	194.0 *
27	369.300	194.0 *	369.300	99.00 *	368.000	98.99 *	368.000	98.00 *	369.700	189.0 *	369.300	198.0 *
28	369.300	97.01 *	368.000	99.99 *	368.000	102.0 *	368.000	97.01 *	368.000	197.0 *	369.700	199.0 *
29	369.300	179.0 *	368.000	101.0 *	368.000	98.00 *	368.000	95.99 *	369.700	194.0 *	369.700	198.0 *
30	369.300	97.01 *	368.000	98.99 *	368.000	95.00 *	368.000	95.00 *	368.000	194.0 *	369.700	199.0 *
31			368.000	102.0 *	368.000	95.99 *			369.700	194.0 *		
Ten-Daily Mean												
I Ten-Daily	369.300	97.80	369.300	97.90	368.000	98.99	368.000	98.99	368.000	120.0	369.150	182.1
II Ten-Daily	369.300	98.20	368.650	96.63	368.000	102.0	368.000	102.0	368.880	136.8	369.150	194.1
III Ten-Daily	369.300	114.7	368.236	99.80	368.000	98.00	368.000	98.00	368.891	162.9	368.940	174.4
Monthly												
Min.	369.300	95.00	368.000	95.00	368.000	95.0	368.000	95.0	368.000	70.00	368.000	75.97
Max.	369.300	194.0	369.300	102.0	368.000	102.0	368.000	102.0	369.700	197.0	369.700	205.0
Mean	369.300	103.6	368.713	97.87	368.000	98.00	368.000	38.63	368.600	151.2	369.080	183.2

Annual Runoff in MCM = 4424 Annual Runoff in mm = 304

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge #:Discarded Discharge (values changed as per rating curve)

Stage Discharge Sheet for Narmada at Bijora for the period 2017-18

Day	Dec		Jan		Feb		Mar		Apr		May	
	W.L	Q	WL	Q	WL	Q	WL	Q	WL	Q	WL	Q
1	369.700	196.8 *	369.700	199.0	369.300	102.0 *	369.700	101.0	369.300	103.0	369.300	213.0 *
2	369.700	175.0 *	369.700	199.0	369.300	101.0 *	369.300	101.0	369.300	103.0	369.300	105.0 *
3	369.300	186.0 *	368.000	202.0	369.300	101.0 *	369.300	102.0	369.700	200.0	369.300	212.0 *
4	369.300	192.0 *	369.700	196.0	368.000	102.0 *	369.300	103.0	368.000	201.0	369.300	208.0 *
5	369.300	98.99 *	369.700	202.0	368.000	96.98 *	368.000	101.0	368.000	103.0	369.300	214.0 *
6	368.000	92.00 *	369.700	19.91	368.000	101.0 *	368.000	101.0	368.000	105.0	369.300	207.0 *
7	369.700	95.99 *	369.700	202.0	369.300	105.0 *	368.000	102.0	368.000	105.0	369.300	88.01 *
8	368.000	199.0 *	369.700	201.0	369.300	97.01 *	368.000	103.0	369.300	103.0	369.300	89.99 *
9	369.300	194.0 *	368.000	200.0	369.300	100.0 *	369.300	103.0	369.300	105.0	369.300	107.0 *
10	369.300	199.0 *	369.700	201.0	369.300	103.0 *	369.300	103.0	369.300	105.0	369.300	107.0 *
11	368.000	195.0 *	369.300	101.0	369.300	102.0 *	369.300	103.0	369.300	105.0	369.300	108.0 *
12	368.000	200.0 *	369.300	99.99	369.300	101.0 *	369.300	103.0	369.300	108.0	369.300	108.0 *
13	369.700	194.0 *	369.300	100.8	369.300	101.0 *	369.300	103.0	369.300	107.0 *	369.300	108.0 *
14	368.000	186.0 *	369.300	103.0	368.000	100.0 *	369.300	103.0	369.300	107.0	369.300	108.0 *
15	369.300	198.0 *	369.300	98.99	369.300	103.0 *	369.300	103.0	368.000	105.0	369.300	107.0 *
16	368.000	199.0 *	369.300	102.0	369.300	101.0 *	369.300	103.0	368.000	104.0	369.300	108.0 *
17	368.000	194.0 *	369.300	101.0	369.300	114.0 *	369.300	103.0	368.000	103.0	369.300	108.0 *
18	368.000	199.0 *	369.300	102.0	369.300	101.0 *	368.000	102.0	369.300	106.0	369.300	107.0 *
19	369.700	184.0 *	369.300	102.0	368.000	98.00 *	368.000	103.0	369.300	105.0	369.300	107.0 *
20	369.300	198.0 *	369.300	102.0	368.000	98.99 *	369.300	104.0	369.300	105.0	369.300	107.0 *
21	368.000	197.0 *	369.300	102.0	369.300	102.0 *	369.300	104.0	369.300	105.0	369.300	107.0 *
22	368.000	192.0 *	369.300	102.0	369.700	101.0 *	369.300	104.0	369.300	206.0	369.300	107.0 *
23	368.000	196.0 *	369.300	102.0	369.700	103.0 *	368.000	102.0	369.300	209.0	369.300	107.0 *
24	368.000	198.0 *	369.300	102.0	369.700	103.0 *	369.300	103.0	369.300	105.0	369.300	107.0 *
25	369.700	199.0 *	369.300	102.0	369.700	103.0 *	369.300	103.0	369.300	210.0	369.300	107.0 *
26	369.300	197.0 *	369.300	102.0	369.700	103.0 *	369.300	103.0	369.300	214.0	369.300	108.0 *
27	369.700	196.0 *	369.300	102.0	369.700	103.0 *	369.300	103.0	369.300	210.0	369.300	107.0 *
28	369.300	196.0 *	369.300	102.0	369.700	102.0 *	368.000	103.0	369.300	212.0	369.300	106.0 *
29	369.700	200.0 *	369.300	102.0			368.000	103.0	369.300	211.0	369.300	105.0 *
30	368.000	199.0 *	369.300	102.0			369.300	103.0	369.300	211.0	369.300	106.0 *
31	368.000	200.0 *	369.300	101.0							369.300	105.9 *
Ten-Daily Mean												
I Ten-Daily	369.160	162.9	369.360	182.2	368.910	100.9	368.820	102.0	368.820	123.3	369.300	155.1
II Ten-Daily	368.600	194.7	369.300	101.3	368.910	102.0	369.040	103.0	368.910	105.5	369.300	107.6
III Ten-Daily	368.700	197.3	369.300	101.9	369.650	102.5	368.910	103.1	369.300	189.3	369.300	106.6
Monthly												
Min.	368.000	92.00	368.000	19.91	368.000	96.98	368.000	101.0	368.000	103.0	369.300	88.01
Max.	369.700	200.0	369.700	202.0	369.700	114.0	369.700	104.0	369.700	214.0	369.300	214.0
Mean	368.816	185.4	369.319	127.6	369.121	101.8	368.923	102.7	369.010	139.4	369.300	122.6

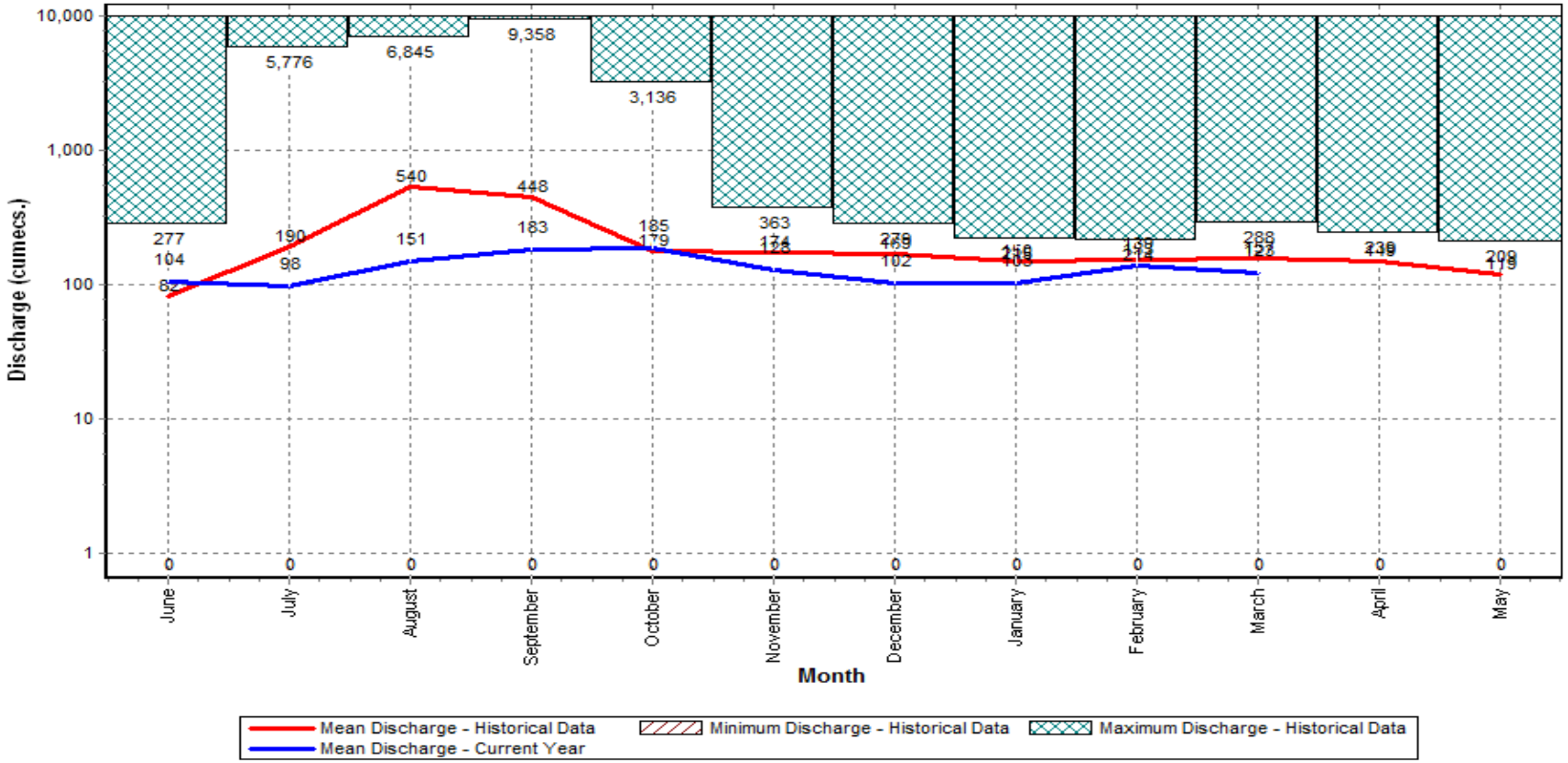
Peak Computed Discharge = 208.0 cumecs on 18/08/2016 Corres. Water Level :370.4 m
Lowest Computed Discharge = 0.000 cumecs on 06/07/2016 Corres. Water Level :368 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge #:Discarded Discharge (values changed as per rating curve)
Note:Missing values ignored while arriving at Annual Runoff

Histogram- Hydrograph for Water Year : 2017-18 (Data considered : 2000-2018)

Station Name : Narmada at Bijora (NA) Division : DDPC, Bhopal

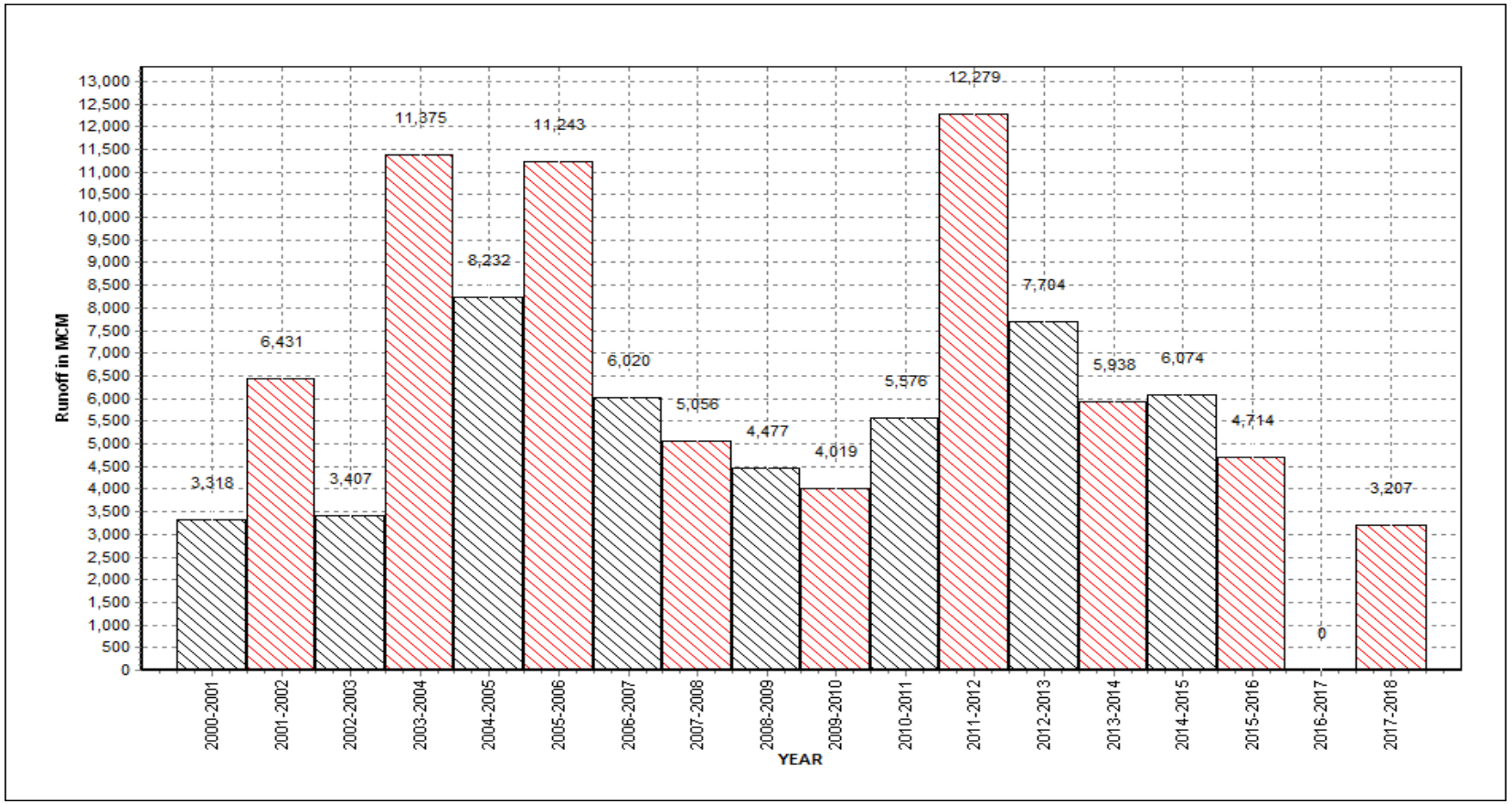
Local River : Narmada Sub-Division : SDDPC, Bhopal



Annual Runoff Values for the period: (2000– 2018)

Station Name : Narmada at Bijora (NA) Division : DDPC, Bhopal

Local River : Narmada Sub-Division : SDDPC, Bhopal



Note: Missing values have not been considered while arriving at Annual Runoff

Monthly Average Runoff for the year (2017-18)

Station Name : Narmada at Bijora (NA)

Division : DDPC, Bhopal

Local River : Narmada

Sub-Division : SDDPC, Bhopal