Table of Contents

SECTION 1: INTRODUCTION

The first main objective of the project as outlined in the RFP is "to study the hydrological data of the major river catchments and identify suitable locations for the development of Major Multi – Purpose Dams within the Kaduna State". The present report addresses this first objective. As previously mentioned in the Inception report, new sites identification throughout Kaduna State has been conducted by using the following information:

- Topographical maps at 1/50,000 scale with full state coverage,
- Digital Terrain Model derived from satellite images (SRTM – Shuttle Radar Topography Mission -USGS),
- Satellite images from Google Earth,
- Previous studies (Parkman, Jica).

Sites preliminary selection was made according to the following criteria:

- Relatively narrow valleys to construct cost-effective dams,
- Large catchment areas to allow for major dams development,
- Large reservoirs to impound important amounts of water (based on rough runoff estimates),
- Reservoirs should not flood existing dams, towns or important villages,
- Preference is given to sites located upstream of main supply areas to allow for supply by gravity without need for pumping stations.

Finally, 9 potential sites have been selected at the inception stage. This report presents first the rainfall and runoff analyses related in general to Kaduna State and then identifies the main hydrologic features related to each dam site. Figure 1.1 shows these dams' locations. The following Table 1.1 gives the main features of the potential sites.

It should be noted that site Galma1 identified on Galma river and visited by the project team has been cancelled as it is located within the reservoir of a new dam under construction.

Table 1.1: Potential dam location and catchment area

Name	River	N (dec. degrees)	E (dec. degrees)	Catchment (km^2)
Galma 3	Likarbu	10.856	7.811	1036.29
Bakin Kogi	Kaduna	9.933	8.357	1684.87
Masaka	Tubo	10.476	7.230	5866.00
Yola Buruku	Tubo	10.604	7.230	5620.91
New Yola Buruku	Tubo	10.637	7.242	5587.00
Babbon Kogi	Babbon Kogi	9.766	7.944	1020.05
Upper Tubo	Tubo	10.802	7.297	2949.64
Karami & Kaduna	Kaduna	10.505	7.829	10057.08
Itisi	Kaduna	10.447	7.877	5882.00

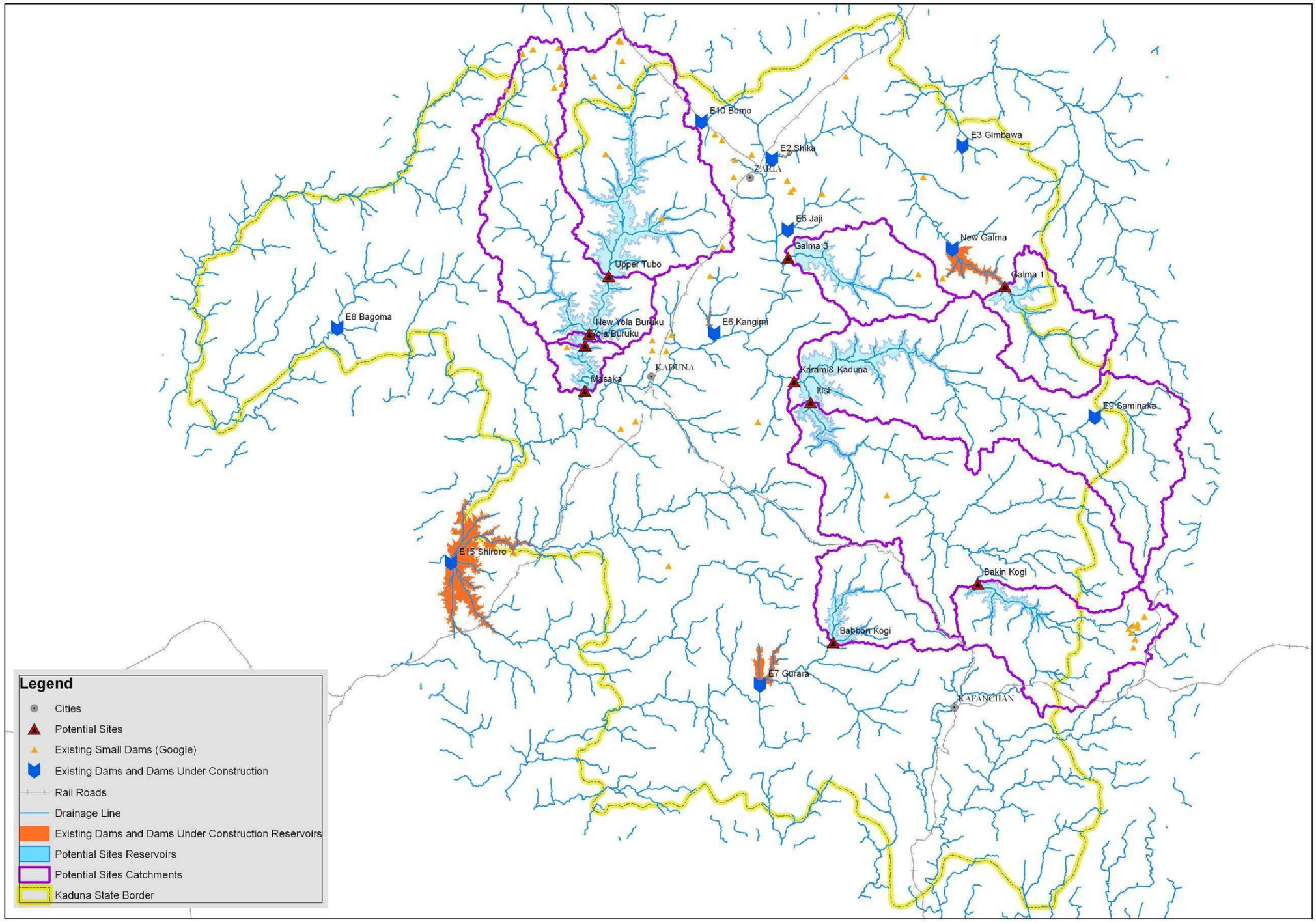


Figure 1.1: Existing and new sites locations

SECTION 2: CLIMATE

In this section, the geographical setting, the climate portrayal and the evaporation estimates are presented leaving the extensive rainfall data analysis in the next chapter dedicated to this aspect.

2.1 Geographical Setting

Kaduna State is situated upstream of the confluence of the Niger and Benue Rivers. In this area, River Kaduna is the main tributary of the Niger River. It rises on the Jos Plateau 29 km southwest of Jos town and flows in a north-westerly direction to a bend 35 km northeast of Kaduna town. It then adopts a south-westerly and southerly course before completing its 550-kilometre flow to the Niger River at Mureji. Most of its course passes through open savannah woodland, but its lower section has cut several gorges (including the 3-kilometre granite ravine at Shiroro Dam location, above its entrance into the extensive Niger floodplains (Iloeje, 1982). Within Kaduna State, the Galma, the Tubo, the Udawa and the Karami catchments are tributaries to the Kaduna River from the north. The Kusheriki, which is the headwaters of the Yiariga River, flows into the Kaduna River from the north in Niger State and the Sarkin Pawa River is tributary in Niger State from the south. The south east corner of Kaduna State comprises the headwaters of the Gurara River catchment that drains to the Niger River and the Mada River catchment that drains to the Benue River. The north east corner of Kaduna State is drained to Lake Chad Basin. Figure 1.1 illustrates the drainage pattern of Kaduna State.

2.2 Climate

Kaduna State spans an area from 9° to 11°30 N. Its climate is described as a transition zone between tropical sub-humid in the south to semi-arid savannah in the north. The rainy season is from May to October, with 1600 mm in the south to less than 700 mm in the north, on average. The dry spell is from November to February with very rare rainfall occurrences.

The rainfall triggering is associated with the northwards movement or the Inter-Tropical Convergence Zone (ITCZ) across Kaduna State. During the rainy season, relative humidity is high and winds are mainly south-westerly. The area around

Kafanchan town, about 70 km SW of the Jos Plateau, receives more rainfall than surrounding parts of Kaduna State. The southward movement of the ITCZ occurs in October-November and indicates the onset of the dry season, with low relative humidity.

Mean temperatures (Celsius), relative humidity (%), mean sunshine (hours/day) and mean wind run (km/day) for the Kaduna Meteorological Station are listed in the below Table 2.1:

Table 2.1: Meteorological Summary at Kaduna South Station

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Temperature	23.2	25.8	27.9	28	26.9	24.9	23.9	23.5	24.4	25	23.6	23.3
Rel. humidity	24	24	35	58	71	81	86	88	84	73	42	28
Sunshine	8.8	9.4	8.3	7.7	7.8	7.3	5.7	4.3	6.4	8.4	9.3	9.3
Wind run	209	182	151	152	147	128	126	121	88	73	136	155

2.3 Evaporation

Parkman (1997) calculated the evaporation rates by the Penman method and compared it with the monthly rainfalls. These estimates (shown in Table 2.2) are in line with the ones that can be retrieved from the World Water and Climate Atlas, available via the website of the International Water Management Institute: http://www.iwmi.cgiar.org/WAtlas/

For the purposes of estimating the duration of the dry season, the monthly rainfalls at Kaduna for 60 years (1934 - 1993) have been compared with evaporation rates by defining a dry month as a month in which the rainfall in that month is less than two fifths of the corresponding average potential evapotranspiration (Parkman, 1997).

The results are presented graphically (Figure 2.1); the dotted line on the graph indicates that at Kaduna, in 9 out of 10 years on average, the dry season will not exceed 7.3 months. This is in fair agreement with what can be deduced from the expected dates at Kaduna for cessation (10 October) and onset (20 April) of the rainy season, together with a 30% probability that the actual date will he more than

15 days before or after these dates. Coming south from Kaduna, the dry season is expected to be shorter because the onset of the rains is expected earlier and the end of the rainy season is expected later than at Kaduna, with the opposite result going northward (Parkman, 1997).

Table 2.2: Evaporation Estimates for Different Stations in Kaduna State

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Kaduna Met.Station	Eo (mm) *	196	197	224	209	202	171	155	140	158	179	176	155	2162
	Et (mm) **	158	158	181	169	161	134	122	109	122	139	139	138	1730
Samaru Met.Station	Eo (mm)	169	177	219	223	221	188	171	159	171	187	170	162	2217
	Et (mm)	130	135	171	167	174	147	134	126	131	144	128	122	1709
Jos Met.Station	Eo (mm)	175	184	218	189	179	160	142	133	153	179	178	172	2062
	Et (mm)	136	144	175	151	140	126	112	104	119	140	139	132	1618
Guseau Met.Station	Eo (mm)	187	199	230	216	221	178	145	127	146	174	172	172	2167
	Et (mm)	147	156	184	178	179	142	115	101	114	136	135	134	1721

* Monthly open water evaporation rates (Eo, mm)

** Monthly potentail evapotranspiration rates (Et, mm)

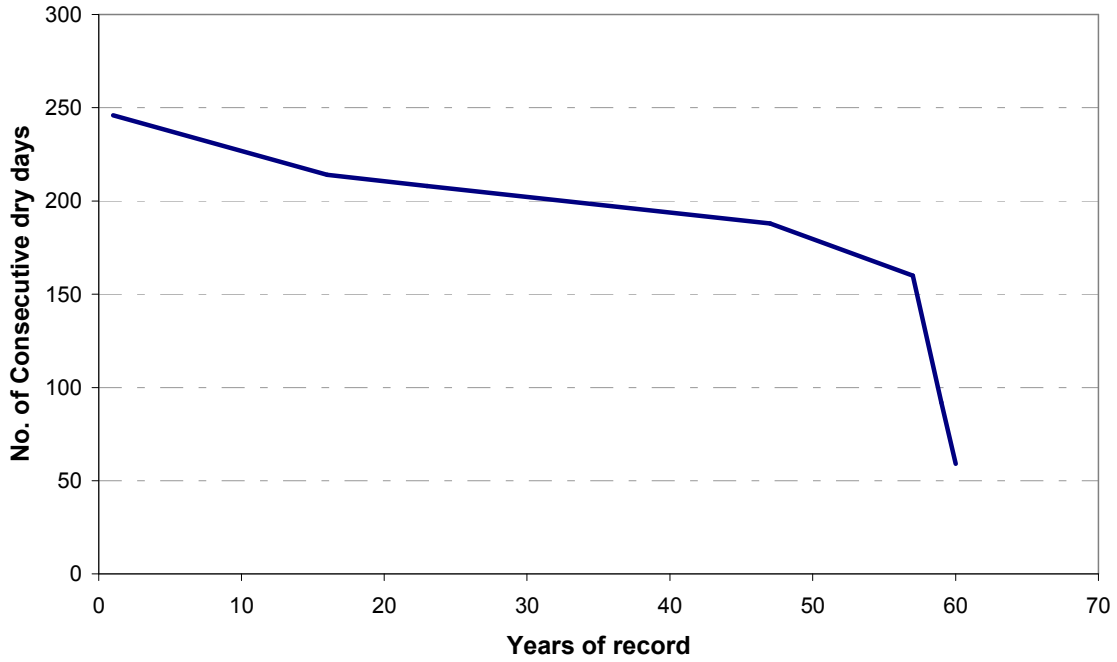


Figure 2.1: Consecutive dry days in 60 years of monthly rainfalls at Kaduna (after Parkman, 1991)

SECTION 3: RAINFALL DATA ANALYSES

Several rainfall stations are available within Kaduna state. Five of them are of interest to the selected potential dams. These stations are listed in Table 3.1 and their locations are illustrated in Figure 3.1.

Table 3.1: Coordinates of Rainfall Stations used in the analyses

Station Name	**X_coord**	**Y_coord**
Kaduna	328512.784	1161122.521
Kauru	410654.755	1170025.618
Kafanchan	423189.362	1061265.858
Kachia	417796.954	1103659.357
Zaria	367118.711	1227308.175

In this chapter, we will present analyses related to the average annual rainfall and its interannual variability, the monthly distribution of rainfall and the monthly rainfall available 80% of the time, as well as the maximum daily rainfall at selected stations and the frequency analysis carried on these extreme records.

3.1 Average annual rainfall and its interannual variability

The average annual rainfall (Figure 3.1) compares well to the isohyetal maps of the JICA Master plan and of Parkman 1997 Master plan. However, these values have the advantage of reflecting also the recent rainfall records available. Generally surface relief in Kaduna State is moderate and values for mean annual rainfall do not vary greatly from one neighboring locality to another, but tend to diminish steadily from south to north (Parkman, 1997).

The interannual fluctuations of the Kaduna South station – available data to the Consultants range from 1954 to 1993 – shows a relatively humid period from 1963 to 1975 and a relatively drier period from 1980 to 1990, as indicated by the 5-year moving average. However, there is no evidence of any clear upward or downward

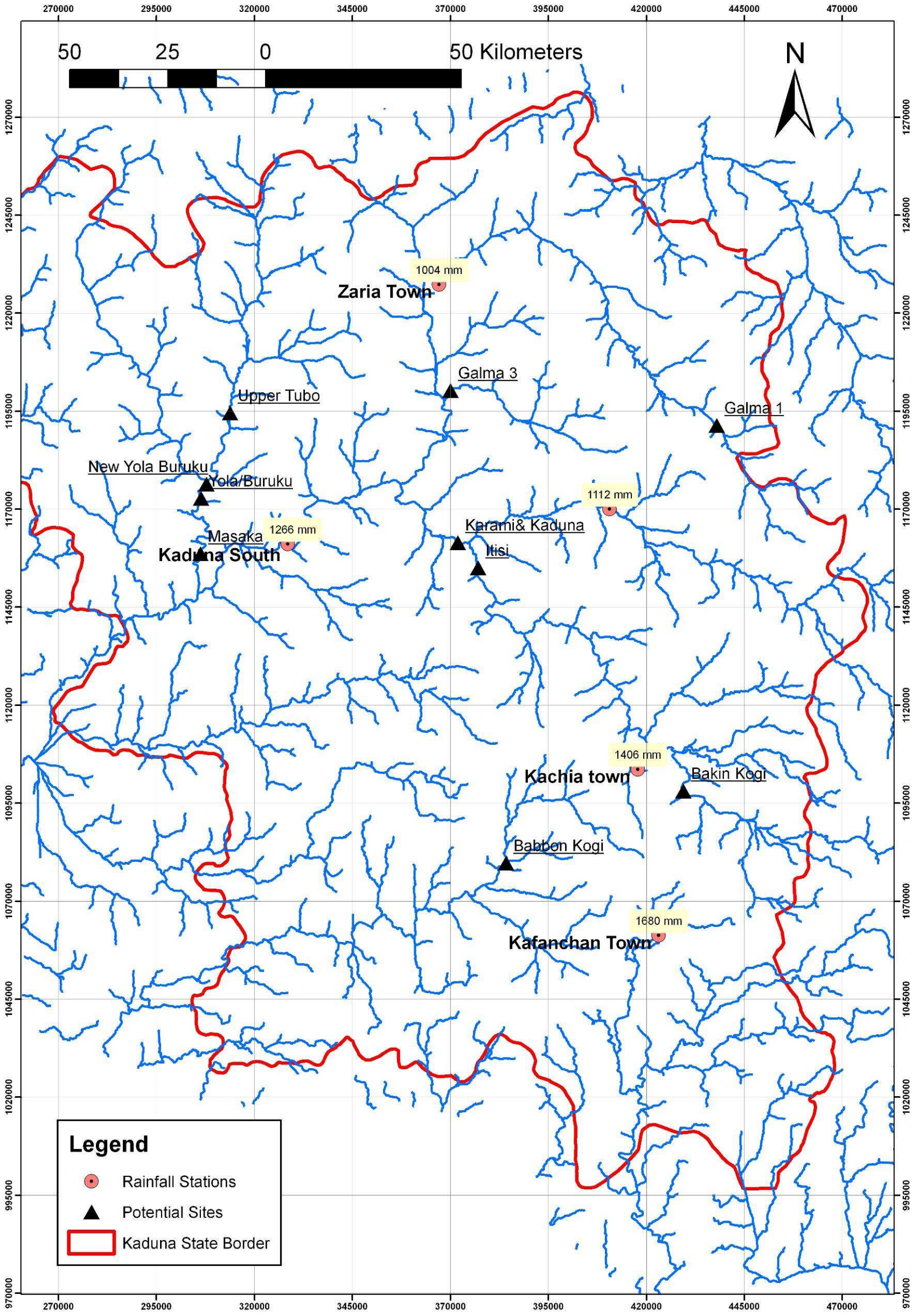


Figure 3.1: Location of rainfall stations used in this study and their average annual rainfall shown with yellow background

trend in the annual rainfall series, as can be seen from the plot (Figure 3.2). The long term annual mean is 1261 mm as calculated on the period from 1954 to 1993. This long term mean calculated over a period from 1920 till 1993 was 1201 mm (source Parkman 1997 study). The two values are very similar.

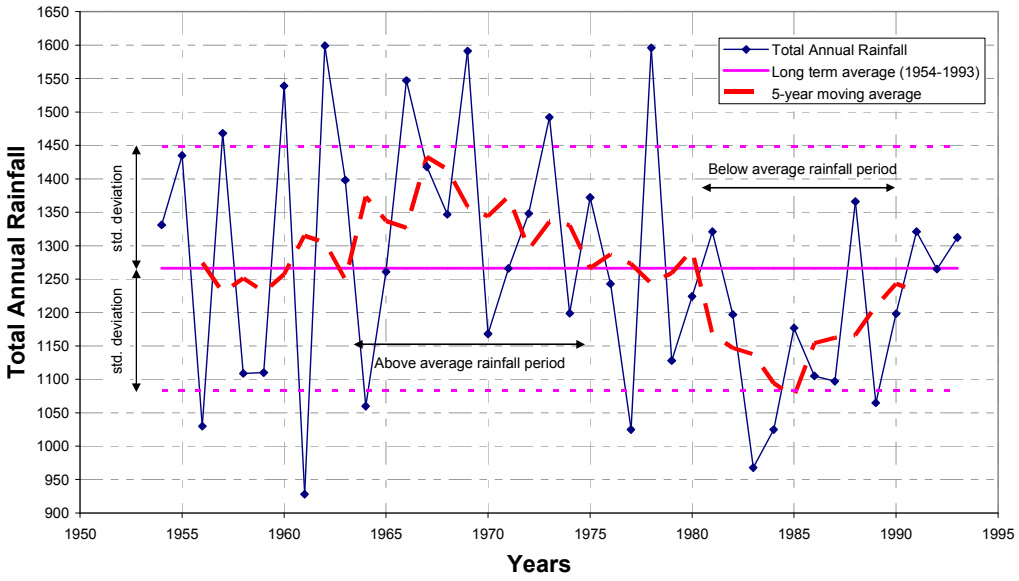
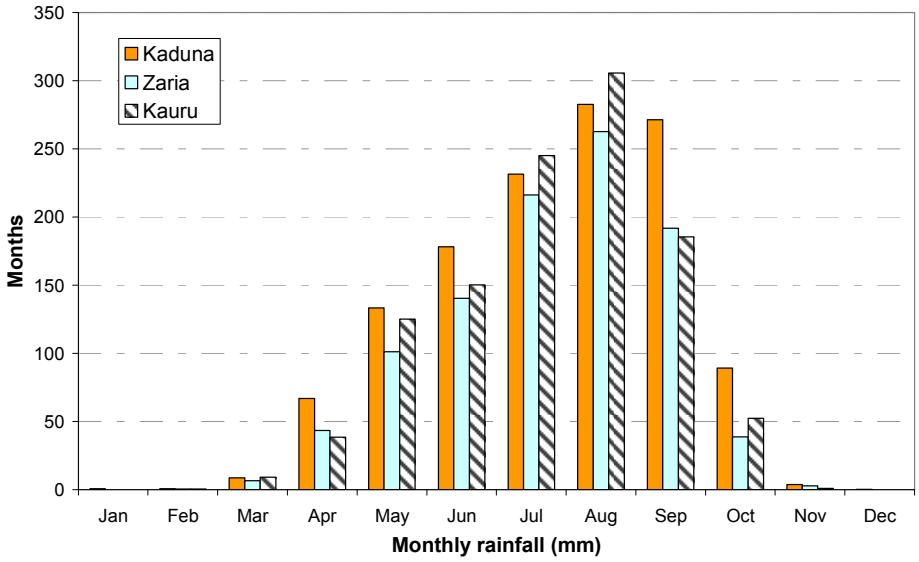


Figure 3.2: Interannual variability of total annual rainfall at Kaduna South Station

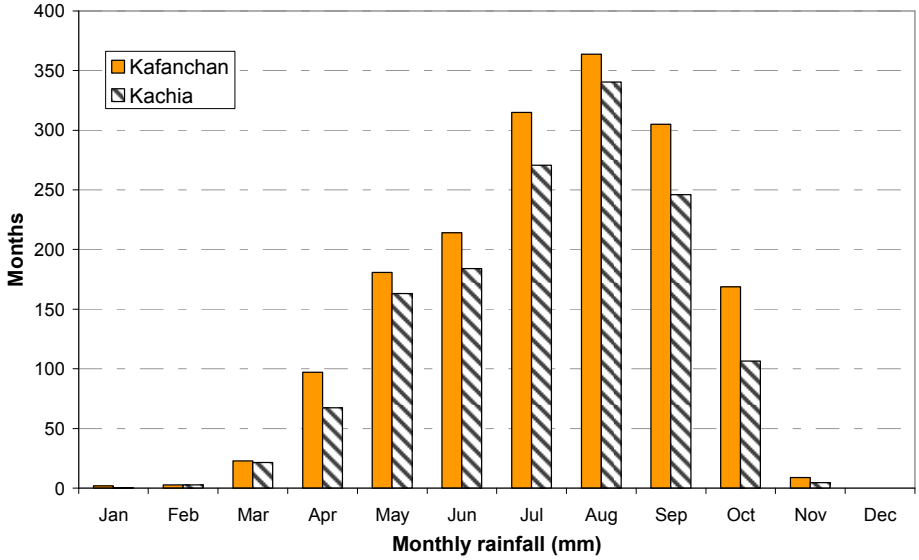
3.2 Monthly rainfall

The monthly distribution of average rainfall for the 3 Northern stations of Kauru, Kaduna and Zaria and the two Southern stations of Kachia and Kafanchan show the same pattern (Figure 3.3). However, the values of the summer rainfall in the Northern stations are higher than those of the Southern stations with about 15%.

Another main feature of the monthly rainfall is the monthly standard deviation as well as the amount of rainfall available 80% of the time (i.e. 4 years out of 5). To estimate this value, frequency analysis should be carried on each month separately. The normal distribution is privileged if the normality assumption is accepted. Kolmogrov Smirnov and Shapiro Wilk tests are used as normality tests. The results of these tests are presented in Appendix B. If normality assumption is not accepted, square root normal distribution is used. The final results of the 80% available rainfall at each month for the previously mentioned stations are summarized in Table 3.2.



(a)



(b)

Figure 3.3: Average monthly rainfall at (a) Northern stations and (b) Southern stations

The 80% available rainfall is actually not required at station location but required at dam location. Therefore, an inverse distance squared average is calculated at each dam locations using the 80% available values at station locations. The 80% available at dam sites is summarized by Table 3.3 below:

Table 3.2: Average and standard deviation of monthly rainfall at selected rainfall stations as well as monthly rainfall available 80% of the time

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Kaduna	Average	1	1	9	67	133	178	231	283	271	89	4	0	1266
	Stdev	3	2	13	56	59	44	77	79	83	82	10	1	183
	Avail. 80%	0	0	0	19	84	141	167	217	201	27	0	0	1113
Kauru	Average	0	0	9	38	125	150	245	306	185	52	1	0	1112
	Stdev	0	2	12	37	65	90	86	147	107	45	3	0	257
	Avail. 80%	0	0	0	7	75	75	173	182	95	15	0	0	896
Zaria	Average	0	0	7	44	101	140	216	263	192	39	3	0	1004
	Stdev	0	2	14	39	60	62	64	82	76	43	10	0	194
	Avail. 80%	0	0	0	8	52	88	162	194	127	5	0	0	840
Kafanchan	Average	2	3	23	97	181	214	315	364	305	169	9	0	1679
	Stdev	6	9	18	90	62	62	120	118	93	112	19	0	330
	Avail. 80%	0	0	7	33	129	165	218	264	227	81	0	0	1402
Kachia	Average	0	3	21	67	163	184	271	340	246	107	5	0	1406
	Stdev	1	10	26	51	75	43	97	72	90	87	11	0	211
	Avail. 80%	0	0	0	24	100	148	189	280	170	36	0	0	1229

Table 3.3: Monthly rainfall available 80% of the time at potential dam sites

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Galma_3	0.00	0.00	0.00	10.71	63.80	97.29	166.89	199.70	135.82	12.69	0.00	0.00
Bakin Kogi	0.00	0.00	0.76	24.40	102.00	147.10	191.38	274.34	173.94	39.42	0.00	0.00
Masaka	0.00	0.00	0.00	18.78	83.27	136.41	168.45	216.65	192.97	26.50	0.00	0.00
Yola/Buruku	0.00	0.00	0.00	18.41	82.43	134.53	168.48	215.96	190.13	25.91	0.00	0.00
New Yola Buruku	0.00	0.00	0.00	18.26	82.09	133.77	168.49	215.68	188.98	25.68	0.00	0.00
Babbon Kogi	0.00	0.00	2.86	25.20	106.51	146.00	196.52	258.21	186.97	49.75	0.00	0.00
Upper Tubo	0.00	0.00	0.00	16.59	78.26	125.17	168.78	212.86	175.90	23.08	0.00	0.00
Karami & Kaduna	0.00	0.00	0.00	14.25	79.89	110.26	173.36	209.36	148.27	22.82	0.00	0.00
Itisi	0.00	0.00	0.00	14.01	80.97	107.98	174.86	210.02	143.06	23.31	0.00	0.00

3.3 Maximum daily rainfall

Another aspect of rainfall analysis is to define design storm profiles for input to a rainfall/runoff model for flood estimations. Selected rainfall records for Kaduna State were inspected to derive annual series for the maximum daily rainfalls. These series, even if short, give an estimate of the mean annual maximum daily rainfall appropriate to each site. It is to be noted that the variation from site to site of the mean annual maximum daily rainfall is limited. This parameter is rather constant over the whole region. A slight increase of 10% compared to

Kaduna South is only observed in Kafanchan station. The daily maximum rainfall data collected from the Kaduna State Water Board yearbooks are presented below along with some statistical parameters.

Table 3.4: Maximum Daily Rainfall for Available Stations

Year	Kafanchan	Saminaka	Birnin- Gwari	Ikara	Kachia	Kaduna South	Kauru	Zaria
1969			78					
1970			83					
1971			89					
1972			54			50.8		
1973			28			74.4		
1974	*157		60			87.1		
1975	*182		71			58.4		48.8
1976	97		63			48.0		55.1
1977	61		63			71.4		57.2
1978	122	46	123	52		88.8		69.2
1979	57	56	46	75	82.8	70.1		62.7
1980		52	49	48	90	45.9		67
1981	71	55	36	57	83.3	65.3	61.8	41.6
1982	77	58	53	127	56.6	60.6	62.3	50.2
1983		78		40	112.8	78.6	55.8	44.2
1984		51		70	41.7	55	57.6	72.2
1985	56	57	79	106	60.7	75	72	80
1986	82	55	63	82	109.2	78	54	67.5
1987	83		64		50	59	69	44
1988	72	109	111	64				
1989								
1990								
1991								
1992								

Average	77.80	61.70	67.39	72.10	76.34	66.65	61.79	58.43
Standard deviation	36.41	18.61	24.02	27.05	25.53	13.36	6.72	12.29
Coef. of variation	0.47	0.30	0.36	0.38	0.33	0.20	0.11	0.21

Values marked with * are considered as outlier and are not used in statistical parameters estimation

Based on the fact that the mean of the maximum daily rainfall is constant, it is more appropriate to use the station where maximum years of record are available to derive the ratios between mean values and high return period estimates. This station is not coming from the Kaduna State Water Board but from the rainfall record of Kaduna airport. Actually, two stations are available: Airport 1 (record from 1959 to 1982) and Airport 2 (record from 1983 to 2004). Table 3.5 shows the maximum daily rainfall data covering the available years in the two stations

along with Kaduna South station for comparison purposes. The same previous remark is also valid: the averages of the three stations are quasi identical. Using the maximum daily rainfall data, the IDF is developed in two steps; first, the frequency analysis of the maximum daily rainfall and then the calculation of the rainfall intensities for shorter durations.

Table 3.5: Maximum daily rainfall for all three stations

Year	Airport1	Airport2	Kaduna South
1959	52.83		
1960	60.45		
1961	77.72		
1962	50.04		
1963	59.94		
1964	90.68		
1965	101.09		
1966	55.88		
1967	97.79		
1968	76.96		
1969	77.98		
1970	48.77		
1971	68.00		
1972	91.00		50.8
1973	66.30		74.4
1974	103.80		87.1
1975	52.10		58.4
1976			48.0
1977			71.4
1978			88.8
1979	79.20		70.1
1980	71.00		45.9
1981	55.10		65.3
1982	58.30		60.6
1983		86.6	78.6
1984		53.2	55
1985		60.6	75
1986		57.6	78
1987		108.1	59
1988		132.1	
1989		45.9	
1990		55.8	
1991		118.6	
1992		59.6	
1993		86	
1994		52	
1995		78.5	
1996		58	
1997		48.3	76.6
1998		60.4	59.2
1999		72.5	95
2000		83.9	100
2001		58.3	88.8
2002		57.9	68.9
2003		80.8	63.4
2004		70.1	54
2005			90
2006			89
2007			75
Average	71.19	72.04	71.34
Standard deviation	17.62	23.12	15.10

3.4 Frequency analysis of daily data:

The frequency analysis showed that the Gumbel distribution was the best fit for the data for each of the three stations. Figures 3.4 (a, b, and c) show the Gumbel fit to the maximum daily data along with the 95% confidence interval. Table 3.6 shows the frequency analysis results for the same data.

Table 3.6: Gumbel frequency values at different return periods

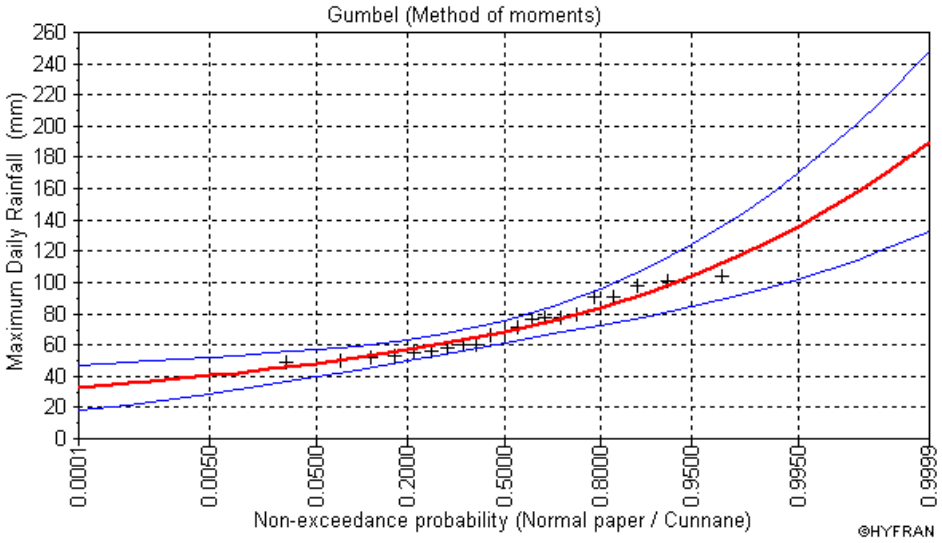
Return period (year)	Airport 1 Station	Airport 2 Station	Kaduna South Station
100	126	145	134
50	117	132	124
25	107	119	115
20	104	115	112
10	94.2	102	103
5	83.9	88.7	93
3	75.7	77.9	85
2	68.3	68.2	78

A statistical comparison between the 2 stations Airport 1 and Airport 2 was carried out to check if they belong to the same distribution and hence to check if one can use an extended record formed of both stations data to increase the accuracy of the frequency analysis.

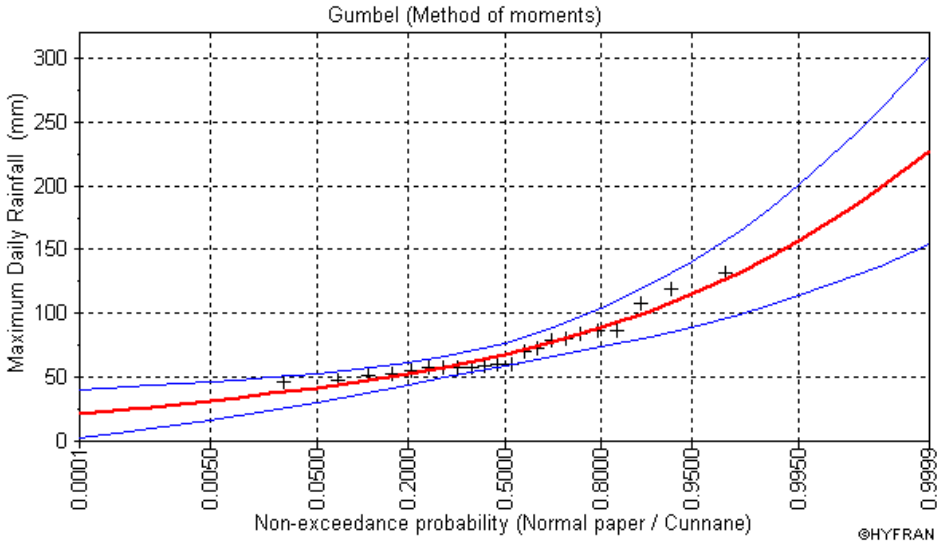
Mann-Whitney, Moses and Two-Sample Kolmogorov-Smirnov tests were used. All tests confirm that the two stations belong to the same distribution and hence one can merge the data from the two stations. The results of the Gumbel fit of the merged Airport 1-2 data is shown in the following Figure 3.5 and Table 3.7.

Table 3.7: Frequency analysis of the merged Airport 1-2 data

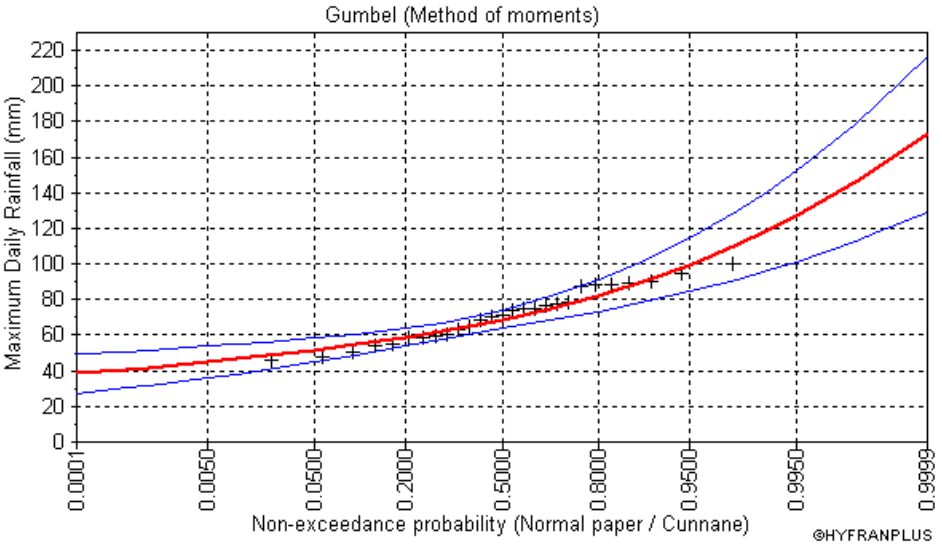
T	XT	Standard deviation	Confidence interval (95%)	
100	136	12.2	112	159
50	124	10.5	104	145
20	110	8.2	93.6	126
10	98.2	6.49	85.5	111
5	86.3	4.8	76.9	95.7
3	76.8	3.62	69.7	83.9
2	68.3	2.85	62.7	73.9



(a)



(b)



(c)

Figure 3.4: Gumbel fit for maximum daily rainfall of the three available stations

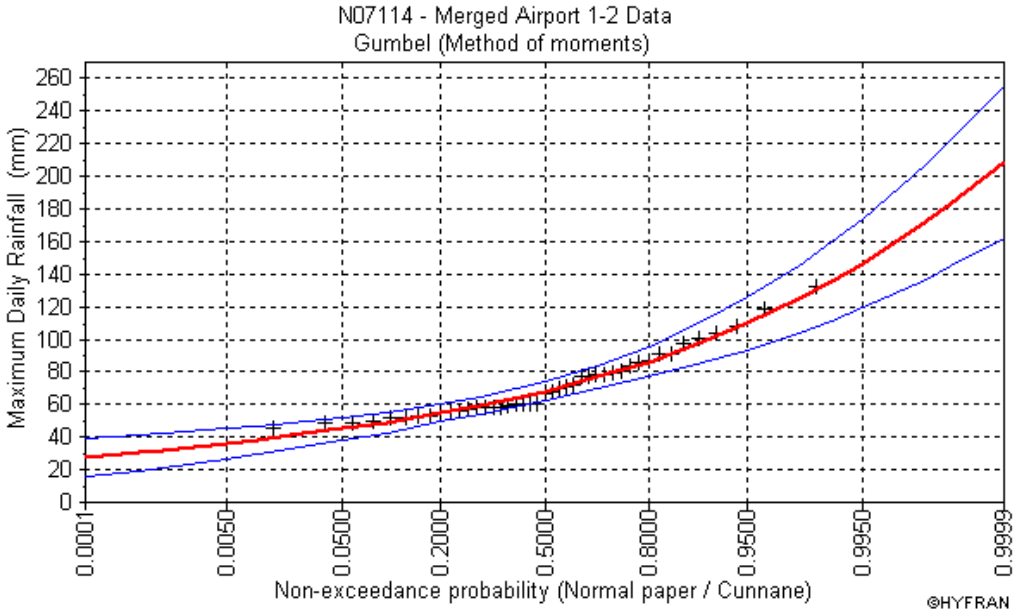


Figure 3.5: Gumbel fit for merged data from airport 1 and airport 2 stations

3.5 Short duration rainfall estimation

In the absence of short duration records or any similar information, the adopted ratios (cf. Table 3.8) between intensities of the 24-hr and those of the 12-, 6-, 3-, 2-, 1-Hr, 30-, 15-, and 5-min were first proposed by Bell in 1969 based on studies in the USA and then tested to several locations in the world. These ratios were also adopted by FAO documents to be used for semi-arid regions (FAO, 1981). These ratios were tested and adjusted based on the available NASA's Tropical Rainfall Measuring Mission (TRMM) data of rainfall. TRMM data is available as 3-hr rainfall and hence can only give ratios from 3-hour till 24 hour.

Table 3.8: Ratios between 24-Hr duration and other storm duration depths

Storm Duration (min)	5	10	20	30	60	120	180	360	720	1440
Adjusted Bell's ratios	0.164	0.236	0.282	0.406	0.514	0.668	0.740	0.900	0.930	1.000

Based on Table 3.8 and the 24-hour rainfall depths at different return periods, the depth-duration rainfall values are calculated (Table 3.9). The Depth-Duration-Frequency values are then divided by their respective rainfall durations to obtain the Intensity-Duration-Frequency rainfall values as shown in Table 3.10 and in Figure 3.6.

Table 3.9: Depth-Duration-Frequency values developed for Kaduna State

	5 min	10 min	15 min	30 min	60 min	120 min	180 min	360 min	720 min	1440 min
5-y	14.18	20.39	24.37	35.01	44.32	57.61	63.86	77.67	80.26	86.30
10-y	16.14	23.20	27.74	39.84	50.43	65.56	72.67	88.38	91.33	98.20
20-y	18.08	25.98	31.07	44.63	56.49	73.43	81.40	99.00	102.30	110.00
25-Y	18.57	26.69	31.92	45.84	58.03	75.44	83.62	101.70	105.09	113.00
50-y	20.38	29.29	35.02	50.31	63.68	82.78	91.76	111.60	115.32	124.00
100-y	22.35	32.13	38.41	55.17	69.84	90.79	100.64	122.40	126.48	136.00

Table 3.10: Intensity-Duration-Frequency values developed for Kaduna State

	5 min	10 min	15 min	30 min	60 min	120 min	180 min	360 min	720 min	1440 min
5-y	170.18	122.32	97.50	70.02	44.32	28.81	21.29	12.95	6.69	3.60
10-y	193.65	139.18	110.94	79.68	50.43	32.78	24.22	14.73	7.61	4.09
20-y	216.91	155.91	124.27	89.25	56.49	36.72	27.13	16.50	8.53	4.58
25-Y	222.83	160.16	127.66	91.69	58.03	37.72	27.87	16.95	8.76	4.71
50-y	244.52	175.75	140.09	100.61	63.68	41.39	30.59	18.60	9.61	5.17
100-y	268.19	192.76	153.65	110.35	69.84	45.40	33.55	20.40	10.54	5.67

A general equation was developed for the IDF curves and is stated below:

Rainfall Intensity (mm/hr) =

(0.4344184 + 0.12648 * ln(return period) - 0.000886765 * ln(return period)^2)

* (472.207 - 148.9203 * ln(duration) + 12.3461 * ln(duration)^2)

where the return period is in years and the duration is in minutes.

An increase of 10% will be applied for Kachia and Kafanchan stations to account for the slightly higher average of maximum daily rainfall.

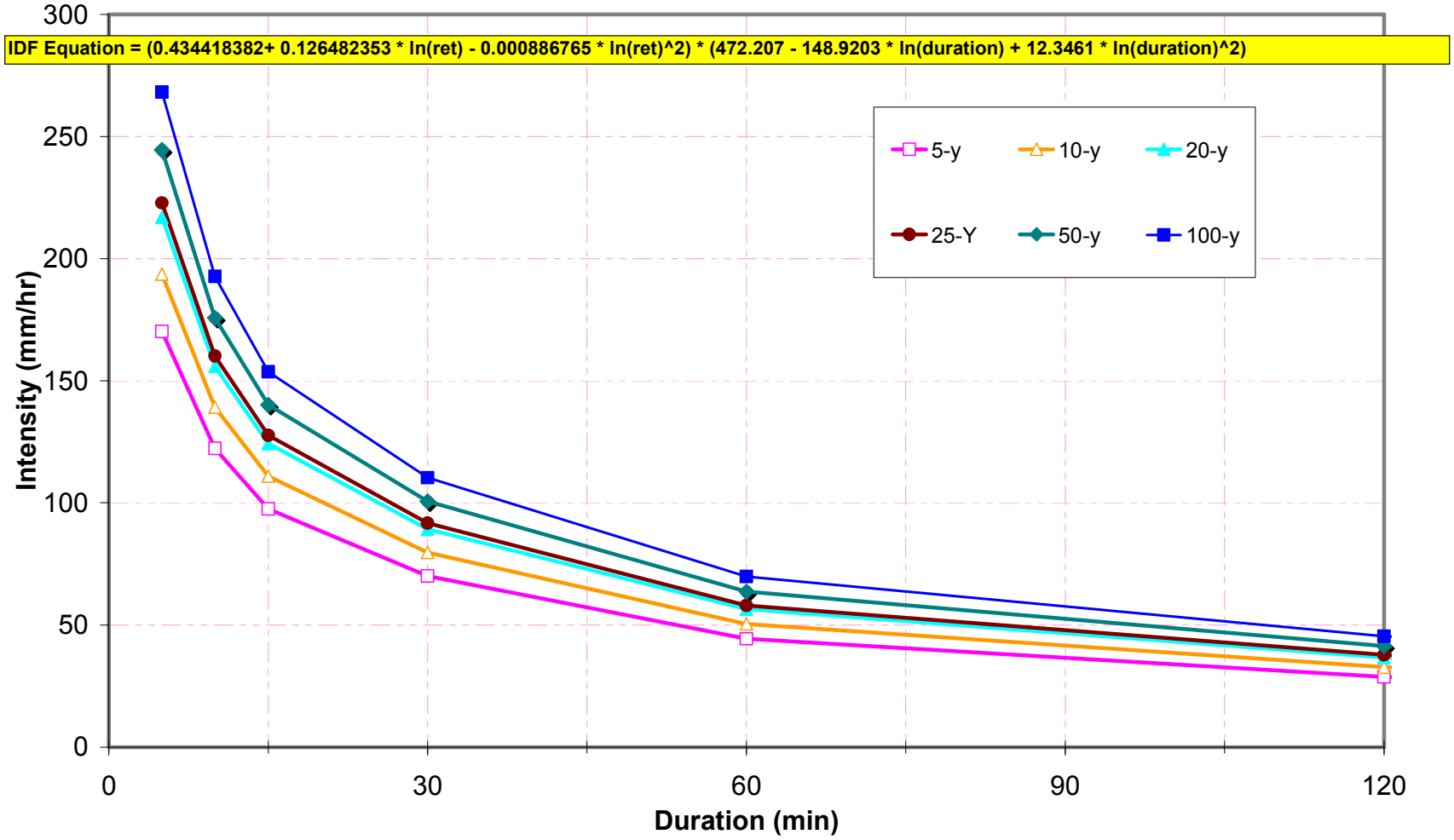


Figure 3.6: Intensity-Duration-Frequency curves developed for Kaduna area

SECTION 4: DISCHARGE DATA ANALYSIS

Two main aspects are related to discharge data analysis:

- average discharge calculation, and
- peak discharge estimation.

Several flow gauging stations are available within Kaduna state. Six of them are of interest to the selected potential dams. These stations are illustrated in Figure 4.1.

In this chapter, we will present analyses related to the monthly discharge and its interannual variability, the monthly distribution of flow, as well as the peak daily discharge and the frequency analysis carried on these extreme records.

A key aspect for making use of the hydrometric data is to have reliable stage – discharge relationships. Unfortunately, in recent Kaduna State Water Board yearbooks, no discharge data are reported and only gauge heights are listed. To estimate discharge for these years, we developed stage-discharge data from the year closest to the ones for which we require an estimate. In the paragraphs below, we present the six stations one by one, illustrating the developed stage-discharge relationship, the summary of data as well as the maximum daily discharge at each year of record.

Another key aspect is the transformation from maximum daily discharge to peak instantaneous discharge. For this, two approaches are used and the one giving the largest result is adopted. The first approach is that of Fuller[1] who gives the peak instantaneous discharge as follows:

$Q_{peak} = Q_{max} (1 + 2.66 (\text{Drainage Area})^{\wedge -0.3})$

The second approach is based on the preceding and following discharges to the peak discharge. It was developed by Sangal[2]. It is formulated as below:

$Q_{peak} = (4 Q_{max} - Q_{preceding\ max} - Q_{following\ max}) / 2$

[1] Fuller, W.E. (1914). "Flood flows". Trans. Am. Soc. Civ. Eng., 77, pp. 564-617.
[2] Sangal, B. P. (1983). "Practical method of estimating peak flow ", J. Hydraul. Eng., 109(4), 549-563.

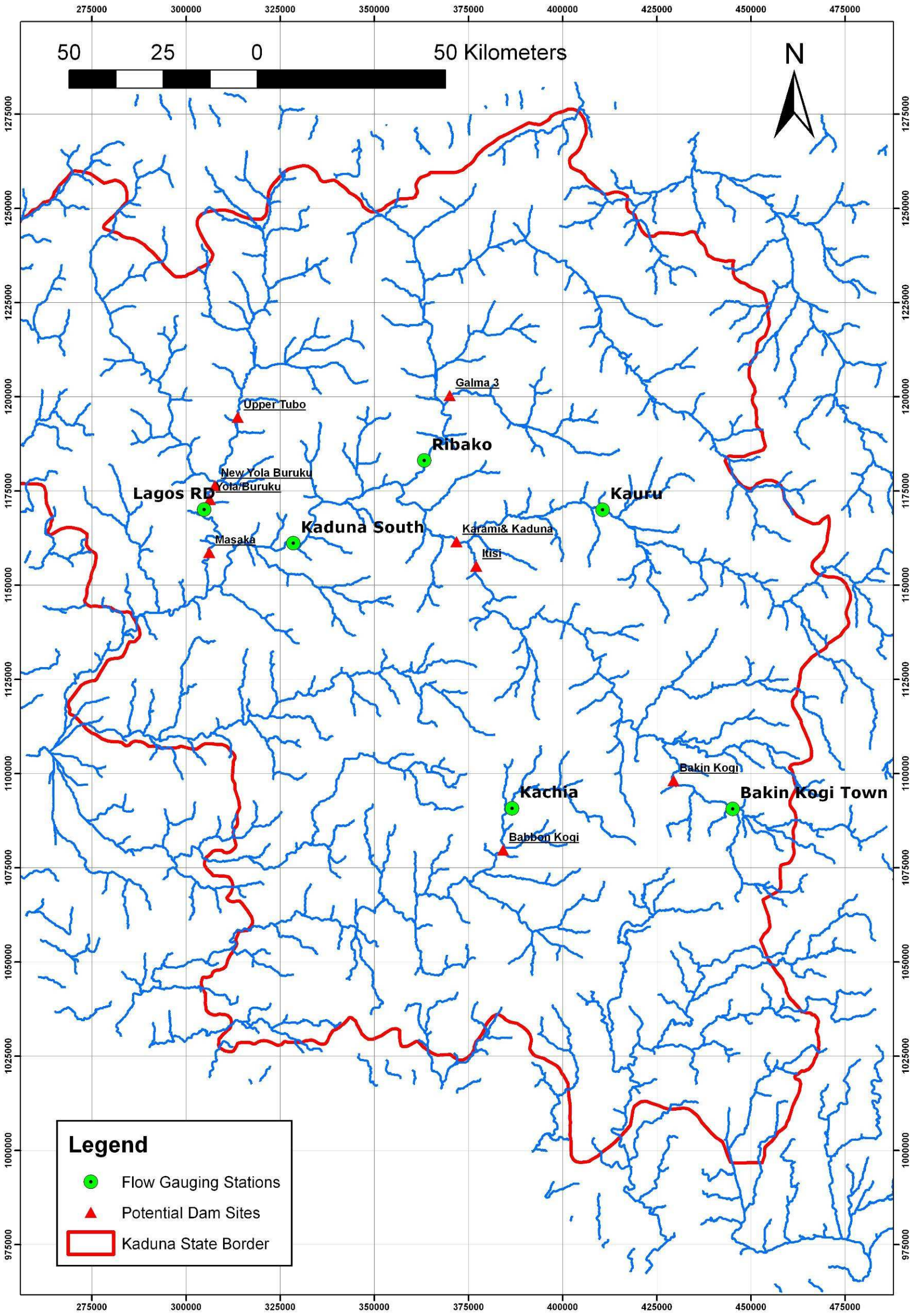


Figure 4.1: Location of flow gauging stations used in this study

4.1 Monthly discharge

4.1.1 Kaduna River at Kaduna South Station

The Kaduna south station at Kaduna River was established in 1944, the Latitude and Longitude for this station are 10°30' and 7°26' respectively, the catchment area is 18,420 km^2.

The available data for this station is the mean daily discharge from 1967 to 1992 and the gauge height from 1967 to 2005. In order to calculate the mean daily discharge from 1993 to 2005 a rating curve is applied. The rating curve formed from 1990 and 1991 is formulated as followed: $Q = 3.62 \times H^{3.45}$ (cf. Figure 4.2)

The monthly discharge for the Kaduna South station is summarized in Table 4.1 and the total runoff at this station is estimated and shown in Table 4.2. The Sangal and Fuller equations are used to estimate instantaneous peak flow from mean daily flow data. The formula giving the largest value is used to estimate the instantaneous peak flow (cf. Table 4.3).

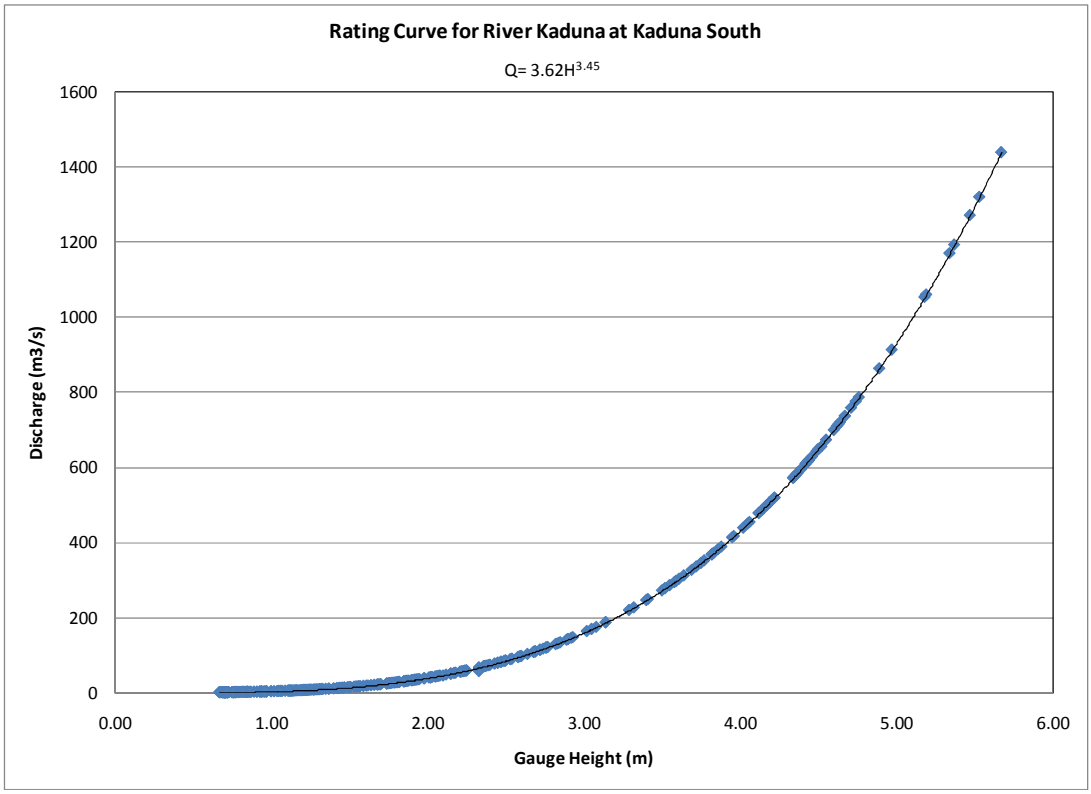


Figure 4.2: Rating Curve for River Kaduna at Kaduna South

Table 4.1: Monthly discharge for Kaduna South Station (m^3/s)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1967	-	-	-	3.36	36.04	83.09	339.87	601.31	821.88	292.66	49.34	16.58
1968	8.66	6.36	5.20	19.49	69.89	273.54	438.34	846.41	549.02	148.42	33.21	11.78
1969	8.64	5.16	2.61	-	-	-	-	-	-	-	-	-
1972	-	-	-	5.69	61.40	114.27	222.02	758.44	539.17	181.43	34.76	10.33
1973	5.47	1.78	1.44	4.01	8.74	61.48	147.48	707.51	655.79	125.11	22.14	8.00
1974	4.06	1.69	4.69	7.65	70.15	70.02	210.39	531.28	1242.12	298.74	39.84	11.79
1975	6.33	3.08	0.65	-	-	-	-	-	-	-	-	-
1977	-	-	-	2.94	25.88	125.65	163.45	327.61	500.73	170.63	15.43	5.86
1978	4.70	5.08	5.43	-	-	-	-	-	-	-	-	-
1979	9.45	3.85	1.34	4.49	53.41	78.14	367.48	577.68	700.25	203.74	46.10	9.89
1980	1.93	2.46	3.26	2.84	61.15	146.66	334.75	541.32	450.13	132.19	32.55	8.77
1981	3.11	1.73	1.34	2.11	47.50	10.17	297.90	499.82	798.79	210.98	36.76	8.72
1982	3.31	1.47	1.62	5.19	18.98	59.30	262.05	490.15	434.77	180.53	29.38	8.05
1983	2.73	1.65	1.40	1.95	18.23	112.15	187.30	385.05	394.94	66.59	10.16	2.97
1984	1.37	1.11	2.93	13.76	33.49	82.93	-	218.00	229.74	128.02	11.78	3.02
1985	1.61	0.36	1.69	6.33	21.34	132.82	287.42	516.49	408.94	83.63	9.64	2.72
1986	1.33	0.77	2.20	2.80	34.70	60.28	33.34	458.26	539.80	333.11	22.91	7.88
1988	3.46	3.05	2.43	1.84	3.45	361.62	119.15	532.00	572.74	130.43	11.18	3.22
1989	3.28	2.75	1.79	24.31	251.60	122.55	228.41	501.32	403.84	177.79	18.63	4.47
1990	0.00	2.27	1.46	2.29	50.87	53.12	185.02	598.27	658.06	95.82	17.76	6.89
1991	2.50	2.26	2.91	4.83	99.84	118.16	258.54	850.62	372.17	79.83	18.15	6.96
1992	2.42	1.57	1.76	6.97	15.74	104.06	313.94	476.14	1069.26	94.06	20.81	11.89
1994	0.64	0.49	1.34	0.17	22.75	82.29	136.45	615.58	1077.63	279.58	39.52	14.90
1995	1.56	-	-	-	16.54	59.77	130.56	482.36	515.18	94.20	-	-
1996	-	-	-	-	27.63	99.51	325.99	510.27	649.65	196.96	8.79	-
1997	-	-	-	6.75	37.40	137.41	214.15	604.68	696.65	192.08	68.34	17.96
1998	6.17	-	0.85	8.27	33.84	94.12	222.25	679.43	1083.62	369.74	35.95	14.88
1999	6.46	3.31	3.16	5.71	31.27	141.37	360.67	407.27	1029.11	369.75	36.78	6.77
2000	3.39	1.72	2.95	3.41	25.81	168.23	232.08	879.83	912.75	245.18	14.99	6.65
2001	0.22	0.08	0.11	1.32	3.59	11.01	24.33	41.84	-	-	-	-
2004	3.89	2.28	3.07	3.65	38.82	223.94	281.65	593.49	102.46	8.48	-	-

Table 4.2: Monthly and total runoff for Kaduna South Station (mm)[3]

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1947	*1.5*	*0.9*	*0.4*	*0.9*	*0.8*	*13.4*	*30.6*	*87.3*	*121.4*	*3.6*	*0.9*	*0.2*	261.9
1948	*1.1*	*0.7*	*0.6*	*4.9*	*5.8*	*19.4*	*26.6*	*100.4*	*102.4*	*23.7*	*5.2*	*2.0*	292.8
1949	*1.2*	*0.8*	*0.7*	*1.2*	*5.7*	-	-	*5.8*	*46.2*	*9.9*	*2.7*	*1.3*	
1950	*1.1*	*0.8*	*0.7*	*1.4*	*8.7*	*13.1*	*27.1*	*41.6*	*50.1*	*19.6*	*3.7*	*1.6*	169.5
1951	*1.1*	*0.7*	*0.5*	*0.9*	*7.1*	*9.4*	*24.7*	*81.0*	*82.9*	*53.0*	*15.6*	*3.9*	280.8
1952	*1.9*	*1.0*	*0.9*	*0.6*	*6.4*	*7.2*	*27.9*	*40.6*	*65.5*	*35.5*	*5.4*	*2.0*	194.9
1953	*1.2*	*0.8*	*1.1*	*0.8*	*12.4*	*19.9*	*35.4*	*71.7*	*110.0*	*29.1*	*6.5*	*2.2*	291.1
1954	*1.3*	*0.9*	*0.9*	*4.4*	*8.6*	*15.3*	*37.1*	*68.7*	*111.9*	*37.5*	*9.2*	*3.3*	299.1
1955	*1.6*	*0.9*	*0.7*	*0.6*	*5.4*	*13.8*	*43.1*	*74.9*	*122.5*	*56.7*	*11.7*	*3.6*	335.5
1956	*1.9*	*1.1*	*1.3*	*1.5*	*2.0*	*6.2*	*21.1*	*50.0*	*67.4*	*20.1*	*3.2*	*5.1*	180.9
1957	*0.7*	*0.4*	*0.3*	*0.7*	*11.2*	*22.2*	*53.8*	*80.9*	*142.2*	*91.8*	*15.3*	*1.5*	421.0
1958	*2.5*	*0.9*	*0.8*	*2.3*	*4.5*	*13.2*	*24.0*	*49.5*	*83.1*	*30.7*	*4.9*	*1.6*	218.0
1959	*0.9*	*0.4*	*0.1*	*0.6*	*5.7*	*10.7*	*21.1*	*48.9*	*94.2*	*26.9*	*4.2*	*2.3*	216.0
1960	*0.8*	*0.4*	*0.2*	*4.2*	*4.2*	*12.5*	*46.7*	*80.5*	*83.8*	*31.1*	*6.1*	*1.4*	271.9
1961	*1.4*	*0.8*	*0.5*	*0.6*	*43.5*	*10.4*	*37.2*	*57.6*	*64.6*	*15.9*	*3.1*	*4.7*	240.3
1962	*0.7*	*0.5*	*0.6*	*1.8*	*3.9*	*13.1*	*31.3*	*77.1*	*183.3*	*61.2*	*13.0*	*5.1*	391.6
1963	*2.6*	*1.2*	*0.8*	*3.1*	*6.7*	*14.4*	*30.7*	*85.7*	*59.3*	*72.6*	*13.5*	*1.5*	292.1
1964	*2.3*	*0.9*	*0.4*	*1.3*	*4.8*	*14.6*	*37.2*	*110.6*	*167.0*	*27.4*	*6.5*	*1.5*	374.5
1965	-	-	-	-	-	*24.5*	*29.8*	*59.2*	*69.1*	*13.1*	*1.3*	-	
1967	*1.5*	*0.7*	*0.3*	0.5	5.2	11.7	49.4	87.5	115.7	42.6	6.9	2.4	324.5
1968	1.3	0.8	0.8	2.7	10.2	38.5	63.8	123.1	77.3	21.6	4.7	1.7	346.5
1969	1.3	0.7	0.4	-	-	*6.9*	*31.0*	*72.9*	*97.9*	*37.1*	*10.6*	*1.7*	260.4
1972	-	-	-	0.8	8.9	16.1	32.3	110.3	75.9	26.4	4.9	1.5	
1973	0.8	0.2	0.2	0.6	1.3	8.7	21.5	102.9	92.3	18.2	3.1	1.2	250.9
1974	0.6	0.2	0.7	1.1	10.2	9.9	30.6	77.3	174.9	43.5	5.6	1.7	356.2
1975	0.9	0.4	0.1	*2.1*	*13.4*	*13.0*	*51.2*	*101.1*	*142.9*	*33.8*	*7.6*	*1.9*	368.4
1976	*1.5*	*0.5*	-	*1.3*	*5.7*	*15.1*	*43.1*	*64.2*	*66.9*	*54.1*	*16.1*	*3.5*	272.0
1977	*2.3*	*1.2*	*0.3*	0.4	3.8	17.7	23.8	47.7	70.5	24.8	2.2	0.9	195.5
1978	0.7	0.7	0.8	-	-	-	-	-	-	-	-	-	
1979	1.4	0.5	0.2	0.6	7.8	11.0	53.5	84.0	98.6	29.6	6.5	1.4	295.2
1980	0.3	0.3	0.5	0.4	8.9	20.6	48.7	78.8	63.4	19.2	4.6	1.3	246.9
1981	0.5	0.2	0.2	0.3	6.9	1.4	43.3	72.7	112.5	30.7	5.2	1.3	275.2
1982	0.5	0.2	0.2	0.7	2.8	8.3	38.1	71.3	61.2	26.3	4.1	1.2	215.0
1983	0.4	0.2	0.2	0.3	2.7	15.8	27.3	56.0	55.6	9.7	1.4	0.4	170.0
1984	0.2	0.1	0.4	1.9	4.9	11.7	*21.7*	31.7	32.3	18.6	1.7	0.4	125.7
1985	0.2	0.0	0.2	0.9	3.1	18.7	41.8	75.1	57.6	12.2	1.4	0.4	211.7
1986	0.2	0.1	0.3	0.4	5.0	8.5	4.9	66.7	76.0	48.5	3.2	1.1	214.9
1988	0.5	0.4	0.4	0.3	0.5	50.9	17.3	77.4	80.6	19.0	1.6	0.5	249.3
1989	0.5	0.4	0.3	3.4	36.6	17.3	33.2	72.9	56.9	25.9	2.6	0.7	250.5
1990	0.0	0.3	0.2	0.3	7.4	7.5	26.9	87.0	92.7	13.9	2.5	1.0	239.8
1991	0.4	0.3	0.4	0.7	14.5	16.6	37.6	123.8	52.4	11.6	2.6	1.0	261.9
1992	0.4	0.2	0.3	1.0	2.3	14.7	45.7	69.3	150.5	13.7	2.9	1.7	302.6
1994	0.1	0.1	0.2	0.0	3.3	11.6	19.9	89.6	151.7	40.7	5.6	2.2	324.8
1995	0.2	-	-	-	2.4	8.4	19.0	70.2	72.5	13.7	-	-	
1996	-	-	-	-	4.0	14.0	47.4	74.2	91.5	28.7	1.2	-	
1997	-	-	-	0.9	5.4	19.3	31.2	88.0	98.1	27.9	9.6	2.6	283.1
1998	0.9	-	0.1	1.2	4.9	13.3	32.3	98.8	152.6	53.8	5.1	2.2	365.1
1999	0.9	0.4	0.5	0.8	4.5	19.9	52.5	59.3	144.9	53.8	5.2	1.0	343.7
2000	0.5	0.2	0.4	0.5	3.8	23.7	33.8	128.0	128.5	35.7	2.1	1.0	358.1
2001	0.0	0.0	0.0	0.2	0.5	1.6	3.5	6.1	-	-	-	-	
2004	0.6	0.3	0.4	0.5	5.6	31.5	41.0	86.3	14.4	1.2	-	-	
Average	1.0	0.5	0.5	1.2	7.2	15.0	33.7	74.5	93.6	30.5	5.6	1.8	265.2

[3] Data marked as *Italic* are taken from the Parkman (1997) study

Table 4.3: Instantaneous Peak Flow for Kaduna South Station (m^3/s)

Year	Daily Discharge 1 day before the max. recorded day (m^3/s)	Max. recorded daily discharge in that year (m^3/s)	Daily Discharge 1 day after the max. recorded day (m^3/s)	Instantaneous Peak Flow (m^3/s)		
				Fuller formula	Sangal formula	Adopted
1967	1274	**1470**	1134	1675	1735	**1735**
1968	892	**1090**	946	1243	1262	**1262**
1972	1838	**2098**	1492	2391	2532	**2532**
1973	1390	**1441**	1010	1643	1683	**1683**
1974	1344	**1795**	1422	2046	2208	**2208**
1976	595	**815**	813	929	926	**929**
1977	912	**1005**	865	1146	1123	**1146**
1979	501	**1068**	953	1217	1409	**1409**
1981	1077	**1192**	1173	1359	1259	**1359**
1982	400	**1251**	689	1426	1958	**1958**
1983	573	**701**	492	798	869	**869**
1984	318	**380**	279	433	461	**461**
1985	809	**1101**	482	1255	1556	**1556**
1986	877	**924**	654	1053	1082	**1082**
1988	1027	**1577**	889	1797	2195	**2195**
1989	495	**1172**	841	1336	1676	**1676**
1990	1322	**1441**	1195	1642	1624	**1642**
1991	607	**1460**	1452	1665	1891	**1891**
1992	1090	**2472**	1940	2817	3429	**3429**
1993	3517	**3687**	3360	4203	3936	**4203**
1994	2420	**3594**	2164	4096	4895	**4895**
1995	921	**986**	877	1124	1073	**1124**
1996	669	**1441**	654	1642	2220	**2220**
1997	1119	**1217**	966	1388	1392	**1392**
1998	2536	**2981**	2981	3397	3203	**3397**
1999	1297	**3085**	1751	3516	4645	**4645**
2000	1069	**1338**	902	1525	1691	**1691**
2001	1069	**1297**	829	1478	1645	**1645**
2004	382	**1194**	1179	1361	1608	**1608**

4.1.2 Tubo River at Mile 20 Lagos Road Station

The Mile 20 Lagos Road station on Tubo River was established in July 1959, the Latitude and Longitude for this station are 10°35' and 7°38' respectively, the catchment area is 5090 km^2. The available data for this station is the mean daily discharge from 1972 to 1992 and the gauge height from 1972 to 2005. In order to calculate the mean daily discharge from 1993 to 2005 a rating curve is applied. The rating curve formed from 1990 to 1991 is formulated as followed: $Q = 2.34 \times H^{2.38}$ (cf. Figure 4.3).

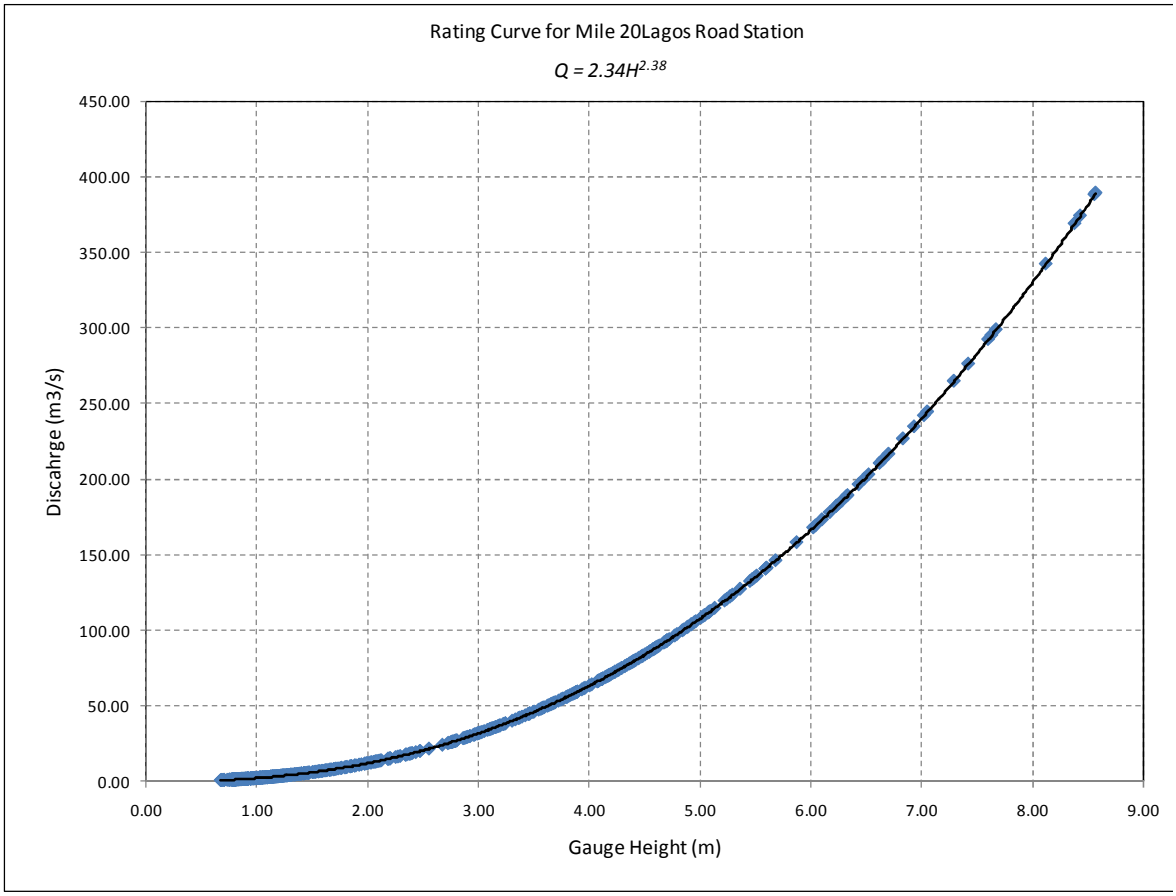


Figure 4.3: Rating Curve for Tubo River at Mile 20 Lagos Road Station

The monthly discharge for the Mile 20 Lagos Road Station on the Tubo River is summarized in Table 4.4 and the total runoff at this station is estimated and shown in Table 4.5. The Sangal and Fuller equations are used to estimate instantaneous peak flow from mean daily flow data. The formula giving the largest value is used to estimate the instantaneous peak flow (cf. Table 4.6).

Table 4.4: Monthly Discharges Mile 20 Lagos Road Station on Tubo River (m^3/s)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1972				0.85	6.02	8.11	6.11	89.48	64.89	13.21	4.77	1.83
1973	1.05	0.15	0.09	0.76	1.46	3.39	8.86	48.23	61.81	17.03	2.05	1.54
1974	2.17	2.28	1.62	0.59	2.34	3.11	17.32	99.28	174.56	43.84	2.98	1.11
1975	0.96	0.72	0.52	1.19	8.73	5.98	32.78	58.17	184.36	30.31	4.77	2.01
1976	1.17	1.80	0.68	1.57	5.70	16.06	49.83	68.03	37.00	58.04	16.40	3.04
1977	1.46	0.78	0.18	0.33	0.30	8.22	8.91	33.78	110.08	21.35	1.62	0.66
1978	0.26	0.25	0.20									
1979												
1980	0.79	0.31	0.26	0.21	1.68	10.82	23.65	67.13	32.50	5.92	0.88	0.45
1981	0.37	0.35	0.26	0.31	5.62	6.59	26.35	106.20	129.90	9.91	1.78	0.83
1982	0.70	0.61	0.57	0.63	1.87	8.41	20.60	72.39	83.66	16.27	1.78	0.68
1983	0.55	0.48	0.44	0.34	0.33	5.28	14.96	51.14	57.26	7.63	0.80	0.53
1984	0.44	0.38	0.35	0.35	3.64	11.42	25.96	62.11	50.14	50.47	2.43	0.65
1985	0.51	0.44	1.35	1.38	5.71	7.97	54.86	200.76	99.93	16.27	0.92	0.64
1986	0.50	0.40	0.39	0.21	2.23	9.81	34.06	133.13	225.36	34.34	8.45	4.91
1987												
1988												
1989												
1990	1.70	1.20	1.65	1.37	5.22	12.35	88.41	89.99	135.79	14.04	4.28	3.01
1991	2.40	2.12	1.87	1.57	26.32	55.52	51.67	103.53	116.96	27.86	4.67	2.85
1992	2.23	1.90	1.56	4.12	22.55	11.71	32.00	95.29	184.15	20.82	5.44	2.92
1993	2.26	1.86	1.78	1.90	11.79	19.38	86.44	154.90	163.77	14.64	5.91	2.37
1994	2.14	1.95	1.80	1.71	8.22	36.05	28.77	110.21	109.44	105.96	10.36	3.47
1995	3.14	2.37	2.11	3.16	5.77	16.78	46.08	71.92	136.88	24.10	4.65	2.80
1996	2.17	2.16	1.95	1.65	1.94	21.74	67.39	125.47	150.53	50.08	7.34	3.77
1997	2.54	1.89	2.16	3.30	8.87	31.65	40.22	124.06	193.86	42.77	8.82	3.73
1998	2.87	2.11	1.84	3.55	5.99	28.21	56.54	204.05	176.30	91.21	11.01	5.16
1999	3.60	2.77	2.31	2.00	4.31	20.68	116.01	141.33	139.46	43.29	6.40	3.46
2000	2.57	2.26	1.89	2.29	17.56	119.00	86.33	95.53	157.29	23.66	3.77	2.07
2001	0.83	0.38	0.23	0.70	135.32	78.07	35.70	74.48	268.19	13.72	0.83	0.18
2002	0.04	0.01	1.18	1.20	9.18	9.09	30.94	98.76	74.81	45.89	5.97	4.84
2003	2.06	1.24	0.40	0.48	0.89	8.02	46.17	238.60	249.63	19.16	2.86	1.18
2004	0.41	0.19	0.07	0.90	6.52	21.30	88.55	122.98	129.56	34.84	6.15	1.02
2005	0.66	0.56	0.09	0.17	3.92	4.57	27.39	77.80	39.09	24.87	1.72	0.09

Table 4.5: Monthly and total runoff for Mile 20 Lagos Road Station on Tubo River (mm)[4]

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1960						*0*	*14.4*	*32.7*	*62.5*	*42.4*	*4.9*	*0.7*	
1961		*0*		*0*	*0*	*6*	*22.6*	*33.5*	*61.4*	*19.8*			
1962				*0.1*	*0.3*	*4.5*	*0*	*61.8*	*104.6*	*47.8*	*9*	*3.2*	
1963	*1.4*	*0.7*	*0.5*	*0.9*	*1.8*	*4.1*	*12.4*	*40.5*	*70*	*47.5*	*8.7*	*2.8*	*191.30*
1964	*1.4*	*0.7*	*0.5*	*0.4*	*1.1*	*3.7*	*15.9*	*79.3*	*107.7*	*21*	*6*	*3*	*240.70*
1965	*1.8*	*1.1*	*0.8*	*0.6*	*1*	*29*	*19.8*	*39.3*	*65.1*	*16.3*	*3.7*	*1.9*	*180.40*
1966	*1.2*	*0.7*	*0.4*	*0.5*	*5.4*	*12.4*	*11.3*	*47.8*	*73*	*43.6*	*7.9*	*3.9*	*208.10*
1967	*2.3*	*2.1*	*0.5*				*19.4*	*44.3*	*56.8*			*1.9*	
1968	*0.9*	*0.6*	*0.4*	*1.4*	*5.1*	*5.3*	*34.2*	*35.4*	*37.3*	*8.6*	*2.3*	*1.2*	*132.70*
1969	*0.8*	*0.4*	*0.4*	*0.7*	*8*	*2.7*	*18.3*	*39.3*	*47.8*	*14.8*	*9*	*0*	*142.20*
1970													
1971													
1972				*0.2*	*3 .7*	*8.7*	*12.4*	*21.8*	*39.5*	*10.9*			
1972		*0.10*	*0.10*	0.37	2.73	3.56	2.77	40.59	28.48	5.99	2.09	0.83	
1973	0.48	0.06	0.04	0.33	0.66	1.49	4.02	21.88	27.13	7.72	0.90	0.70	65.41
1974	0.98	0.94	0.74	0.26	1.06	1.36	7.86	45.03	76.62	19.89	1.31	0.50	156.56
1975	0.43	0.30	0.23	0.52	3.96	2.63	14.87	26.38	80.92	13.75	2.09	0.91	147.01
1976	0.53	0.74	0.31	0.69	2.59	7.05	22.60	30.86	16.24	26.33	7.20	1.38	116.51
1977	0.66	0.32	0.08	0.14	0.14	3.61	4.04	15.32	48.32	9.68	0.71	0.30	83.32
1978	0.12	0.10	0.09										
1979													
1980	0.36	0.13	0.12	0.09	0.76	4.75	10.73	30.45	14.27	2.69	0.39	0.21	64.93
1981	0.17	0.15	0.12	0.14	2.55	2.89	11.95	48.17	57.02	4.49	0.78	0.38	128.80
1982	0.32	0.25	0.26	0.28	0.85	3.69	9.34	32.83	36.72	7.38	0.78	0.31	93.02
1983	0.25	0.20	0.20	0.15	0.15	2.32	6.79	23.20	25.14	3.46	0.35	0.24	62.43
1984	0.20	0.16	0.16	0.15	1.65	5.01	11.77	28.17	22.01	22.89	1.07	0.30	93.54
1985	0.23	0.18	0.61	0.61	2.59	3.50	24.88	91.06	43.87	7.38	0.41	0.29	175.60
1986	0.22	0.17	0.18	0.09	1.01	4.30	15.45	60.38	98.92	15.58	3.71	2.23	202.25
1987													
1988													
1989													
1990	0.77	0.50	0.75	0.60	2.37	5.42	40.10	40.82	59.60	6.37	1.88	1.36	160.54
1991	1.09	0.87	0.85	0.69	11.94	24.37	23.44	46.96	51.34	12.64	2.05	1.29	177.52
1992	1.01	0.79	0.71	1.81	10.23	5.14	14.52	43.22	80.83	9.44	2.39	1.32	171.41
1993	1.02	0.77	0.81	0.83	5.35	8.51	39.21	70.26	71.89	6.64	2.59	1.07	208.95
1994	0.97	0.81	0.82	0.75	3.73	15.82	13.05	49.99	48.04	48.06	4.55	1.58	188.16
1995	1.42	0.98	0.96	1.39	2.62	7.37	20.90	32.62	60.08	10.93	2.04	1.27	142.58
1996	0.98	0.89	0.88	0.73	0.88	9.54	30.57	56.91	66.07	22.71	3.22	1.71	195.11
1997	1.15	0.78	0.98	1.45	4.02	13.89	18.24	56.27	85.10	19.40	3.87	1.69	206.85
1998	1.30	0.87	0.83	1.56	2.72	12.38	25.65	92.55	77.39	41.37	4.83	2.34	263.80
1999	1.63	1.15	1.05	0.88	1.95	9.08	52.62	64.11	61.22	19.64	2.81	1.57	217.69
2000	1.16	0.94	0.86	1.00	7.96	52.24	39.16	43.33	69.04	10.73	1.65	0.94	229.01
2001	0.37	0.16	0.10	0.31	61.38	34.27	16.19	33.78	117.72	6.22	0.36	0.08	270.95
2002	0.02	0.00	0.54	0.53	4.16	3.99	14.03	44.80	32.84	20.81	2.62	2.20	126.54
2003	0.93	0.51	0.18	0.21	0.41	3.52	20.94	108.22	109.57	8.69	1.26	0.53	254.98
2004	0.19	0.08	0.03	0.39	2.96	9.35	40.16	55.78	56.87	15.80	2.70	0.46	184.78
2005	0.30	0.23	0.04	0.08	1.78	2.01	12.42	35.29	17.16	11.28	0.76	0.04	81.38
Average	0.81	0.54	0.46	0.57	4.54	8.70	18.72	46.12	59.15	17.71	3.05	1.23	161.61

[4] Data marked as *Italic* are taken from the Parkman (1997) study

Table 4.6: Instantaneous Peak Discharge for Mile 20 Lagos Road Station on Tubo River (m^3/s)

Year	Daily Discharge 1 day before the max. recorded day (m3/s)	Max. recorded daily discharge in that year (m3/s)	Daily Discharge 1 day after the max. recorded day (m3/s)	Instantaneous Peak Flow (m3/s)		
				Fuller formula	Sangal formula	Adopted
1972	169.08	**176.56**	173.07	211	182	**211**
1973	136.94	**138.95**	135.21	166	142	**166**
1974	194.20	**262.05**	237.38	314	308	**314**
1975	257.73	**265.94**	258.34	318	274	**318**
1976	107.86	**109.40**	104.35	131	113	**131**
1977	194.40	**234.42**	223.01	280	260	**280**
1980	73.24	**121.34**	113.98	145	149	**149**
1981	245.59	**360.62**	310.92	432	443	**443**
1982	158.01	**164.10**	160.27	196	169	**196**
1983	82.46	**156.66**	92.82	187	226	**226**
1984	98.87	**108.75**	81.47	130	127	**130**
1985	424.76	**457.11**	373.78	547	515	**547**
1986	472.00	**532.00**	466.00	637	595	**637**
1990	298.89	**388.14**	374.26	464	440	**464**
1991	369.00	**389.22**	342.33	466	423	**466**
1992	53.41	**258.83**	218.19	310	382	**382**
1993	351.17	**412.79**	365.52	494	467	**494**
1994	139.37	**273.95**	249.10	328	354	**354**
1995	269.57	**292.81**	259.22	350	321	**350**
1996	235.97	**241.66**	214.74	289	258	**289**
1997	240.84	**256.66**	248.27	307	269	**307**
1998	321.02	**345.69**	321.02	414	370	**414**
1999	253.29	**375.63**	363.07	449	443	**449**
2000	3.98	**441.06**	243.30	528	758	**758**
2001	408.14	**442.22**	349.73	529	506	**529**
2002	117.26	**269.57**	240.03	323	360	**360**
2003	402.61	**554.11**	459.86	663	677	**677**
2004	281.95	**291.90**	272.19	349	307	**349**
2005	125.50	**149.08**	107.80	178	182	**182**

4.1.3 Kaduna River at Bakin Kogi Station

The Bakin Kogi station at Kaduna River was established in 1979. The Latitude and Longitude for this station are 9°52' and 8°30' respectively. Its catchment area is 1284 km^2. The available data for this station is the mean daily discharges from 1983 to 1992 and the gauge heights from 1983 to 2005. In order to calculate the mean daily discharge from 1993 to 2005 a rating curve is applied. The rating curve formed from 1990 to 1991 is formulated as followed: $Q = 7.99 \times H^{3.569}$ (cf. Figure 4.4).

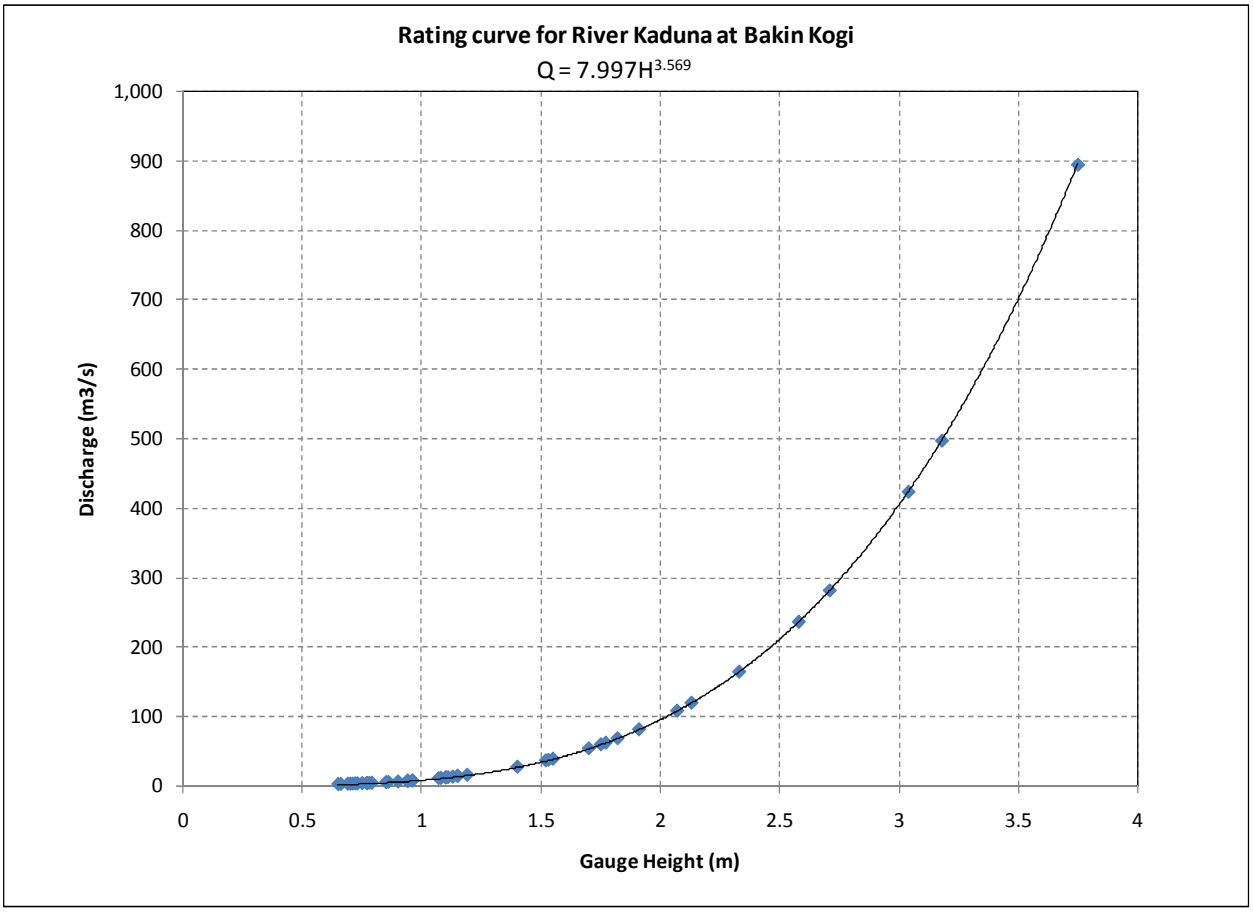


Figure 4.4: Rating Curve for River Kaduna at Bakin Kogi Station

The monthly discharge for the Bakin Kogi Station on Kaduna River is summarized in Table 4.7 and the total runoff at this station is estimated and shown in Table 4.8. The Sangal and Fuller equations are used to estimate instantaneous peak flow from mean daily flow data. The formula giving the largest value is used to estimate the instantaneous peak flow (cf. Table 4.9).

Table 4.7: Monthly Discharges for Kaduna River at Bakin Kogi Station (m^3/s)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1983	5.67	4.27	4.26	4.88	10.12	14.95	23.77	37.33	29.41	12.95	7.59	6.14
1984	-	-	-	-	-	-	-	-	-	-	-	-
1985	7.77	6.40	8.41	9.47	11.09	-	-	38.41	36.42	14.39	8.59	6.26
1986	5.38	5.42	5.17	6.25	14.26	20.68	33.04	31.16	31.36	18.34	11.39	8.26
1989	2.83	1.48	3.80	9.52	52.08	33.22	63.80	264.43	74.54	18.40	3.80	3.53
1990	3.30	2.76	1.96	5.66	31.96	15.25	40.15	148.19	102.33	27.34	8.35	5.29
1991	3.71	2.86	5.09	8.38	22.39	43.78	71.64	124.23	64.28	20.98	9.01	5.75
1993	3.38	1.92	1.26	4.23	6.96	48.33	105.46	66.77	118.79	85.92	16.92	7.90
2001	2.20	0.15	0.02	5.14	0.92	3.75	6.33	202.32	118.81	8.27	0.19	0.01
2002	0.00	0.00	0.00	0.00	0.07	9.03	63.71	78.06	76.15	15.63	3.58	1.67
2003	1.01	0.43	0.58	1.78	1.69	13.08	64.39	158.49	181.67	9.28	4.16	2.99
2004	2.04	1.53	0.94	0.94	2.42	18.30	92.30	147.15	18.24	10.21	0.00	0.00

Table 4.8: Monthly and total runoff for Bakin Kogi Station on Kaduna River (mm)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1983	9.01	6.19	6.77	7.51	16.08	22.99	37.79	59.35	45.24	20.58	11.68	9.76	252.95
1984	-	-	-	-	-	-	-	-	-	-	-	-	
1985	12.36	9.28	13.37	14.56	17.63	-	-	61.07	56.04	22.88	13.22	9.95	230.35
1986	8.55	7.86	8.22	9.61	22.67	31.82	52.52	49.54	48.25	29.16	17.53	13.13	298.85
1989	4.51	2.14	6.05	14.64	82.80	51.10	101.42	420.36	114.67	29.24	5.85	5.61	838.39
1990	5.25	4.00	3.11	8.71	50.81	23.46	63.82	235.58	157.42	43.46	12.84	8.41	616.88
1991	5.89	4.15	8.09	12.89	35.59	67.36	113.88	197.48	98.88	33.36	13.86	9.15	600.58
1993	5.37	2.79	2.00	6.50	11.06	74.35	167.65	106.14	182.74	136.59	26.04	12.56	733.77
2001	3.49	0.22	0.03	7.91	1.47	5.76	10.06	321.62	182.78	13.15	0.29	0.01	546.79
2002	0.00	0.00	0.00	0.00	0.12	13.90	101.28	124.10	117.15	24.85	5.50	2.66	389.55
2003	1.60	0.63	0.92	2.75	2.69	20.12	102.36	251.94	279.48	14.76	6.41	4.75	688.42
2004	3.25	2.22	1.50	1.45	3.84	28.15	146.73	233.93	28.06	16.23	0.00	0.00	465.34

Table 4.9: Instantaneous Peak Discharge for Kaduna River at Bakin Kogi Station (m^3/s)

Year	Daily Discharge 1 day before the max. recorded day (m3/s)	Max. recorded daily discharge in that year (m3/s)	Daily Discharge 1 day after the max. recorded day (m3/s)	Instantaneous Peak Flow (m3/s)		
				Fuller formula	Sangal formula	Adopted
1983	52	**57**	42	75	68	**75**
1985	39	**81**	46	106	119	**119**
1986	31	**82**	37	108	131	**131**
1989	220	**555**	502	729	749	**749**
1990	38	**895**	700	1175	1421	**1421**
1991	288	**423**	190	556	607	**607**
1993	131	**371**	58	487	647	**647**
1994	459	**1571**	1376	2063	2224	**2224**
1995	672	**1231**	878	1616	1687	**1687**
1996	1020	**1296**	1127	1703	1519	**1703**
1997	736	**1545**	1199	2030	2124	**2124**
1998	1127	**1353**	974	1777	1655	**1777**
2001	1068	**1068**	821	1402	1191	**1402**
2002	28	**805**	70	1057	1560	**1560**
2003	284	**380**	344	499	446	**499**
2004	104	**353**	78	464	616	**616**

4.1.4 Karami River at Kauru Station

The Kauru station at Karami River is established at 1963. The Latitude and Longitude for this station are 10°35' and 8°11' respectively. The catchment area is 1911 km^2.

The available data for this station is the mean daily discharge from 1979 to 1992 and the gauge height from 1972 to 2001 – excluding the years 1988, 1993, 1994 where no data is available -. In order to calculate the mean daily discharge from 1995 to 2001 a rating curve is applied. The rating curve formed from 1992 is formulated as followed: $Q = -0.1429H^3 + 4.3236H^2 + 2.38652H$ (Figure 4.5).

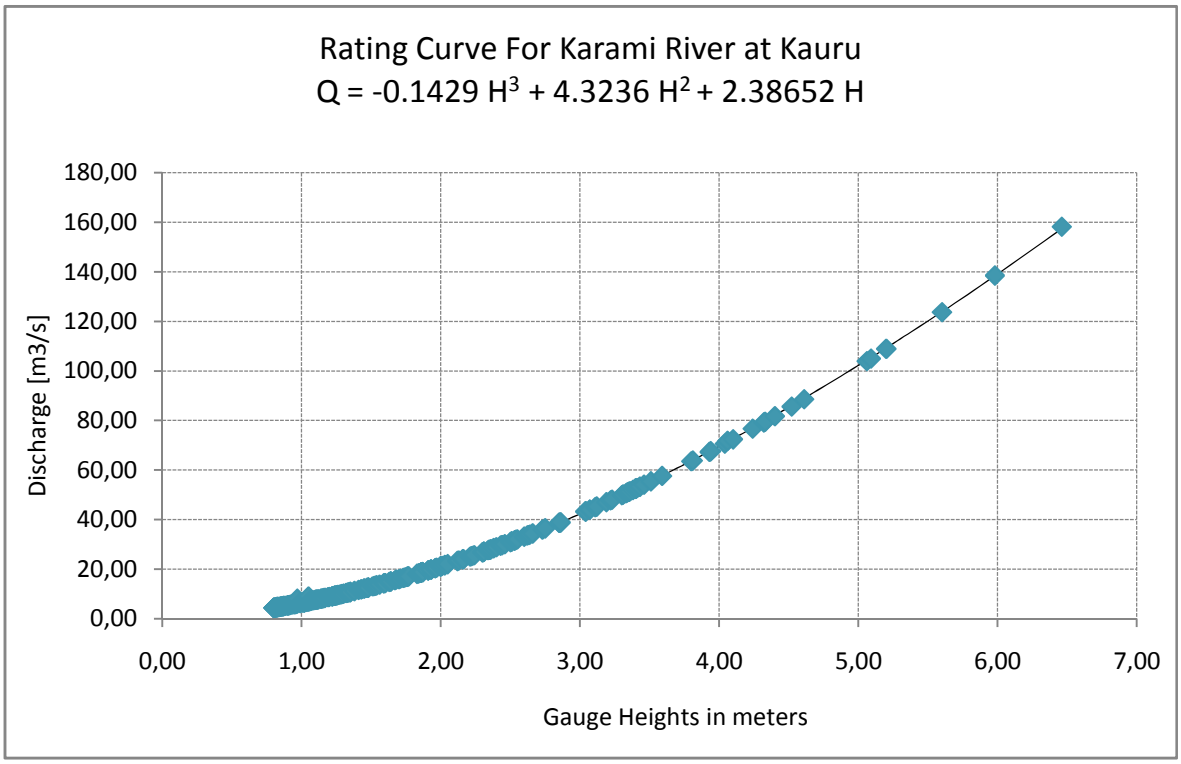


Figure 4.5: Rating Curve for River Karami at Kauru Station

The monthly discharge for the Kauru Station on Karami River is summarized in Table 4.10 and the total runoff at this station is estimated and shown in Table 4.11. The Sangal and Fuller equations are used to estimate instantaneous peak flow from mean daily flow data. The formula giving the largest value is used to estimate the instantaneous peak flow (cf. Table 4.12).

Table 4.10: Monthly Discharges for Karami River at Kauru Station (m^3/s)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1973	0.21	0.29	0.12	0.39	3.52	13.65	27.56	99.38	79.27	15.48	4.04	1.50
1974	0.68	0.44	0.18	0.45	4.51	19.52	38.97	88.15	114.39	32.90	6.40	2.36
1975	0.93	0.48	0.19	1.54	13.90	12.52	61.22	112.46	137.51	27.27	11.09	5.52
1976	3.52	2.15	1.06	1.98	12.96	16.65	59.38	76.82	86.98	52.62	15.06	5.34
1977	2.39	0.95	0.34	0.19	5.29	17.08	23.18	56.35	60.66	20.16	4.03	1.32
1980	1.82	0.77	1.14	5.74	26.84	37.40	90.14	131.33	83.74	0.00	12.43	10.13
1991	0.00	0.00	0.00	0.00	15.20	19.41	36.07	68.24	28.16	13.07	6.66	4.78
1995	1.43	1.02	0.85	2.92	3.31	6.14	6.96	9.24	10.13	3.52	2.59	1.94
1996	3.96	3.03	2.57	3.18	4.69	7.37	8.97	27.98	81.69	69.34	29.82	23.84
1997	3.63	2.12	1.94	5.68	19.65	35.32	32.38	50.32	80.40	38.29	19.09	5.05
1998	0.56	0.37	0.21	0.22	0.37	1.76	3.05	2.87	3.52	2.23	1.24	1.23
1999	3.15	2.67	0.00	0.00	4.79	9.54	13.58	15.91	15.85	3.56	2.81	2.44
2001	2.28	1.81	1.37	2.62	4.83	6.90	14.29	16.17	31.05	7.59	0.00	0.00

Table 4.11: Monthly and total runoff for Kauru Station on Karami River (mm)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
1973	0.29	0.37	0.16	0.53	4.94	18.51	38.63	139.29	107.52	21.69	5.49	2.10	339.51
1974	0.95	0.56	0.25	0.61	6.32	26.48	54.62	123.55	155.16	46.11	8.69	3.30	426.60
1975	1.31	0.61	0.27	2.08	19.48	16.98	85.81	157.62	186.51	38.23	15.04	7.74	531.67
1976	4.93	2.75	1.49	2.68	18.17	22.58	83.22	107.67	117.98	73.75	20.43	7.48	463.13
1977	3.35	1.22	0.48	0.25	7.42	23.17	32.50	78.98	82.28	28.26	5.46	1.86	265.24
1980	2.55	0.98	1.60	7.79	37.62	50.73	126.34	184.06	113.58	0.00	16.86	14.20	556.33
1991	0.00	0.00	0.00	0.00	21.30	26.32	50.56	95.64	38.20	18.31	9.04	6.69	266.07
1995	2.00	1.31	1.20	3.97	4.64	8.33	9.76	12.95	13.74	4.93	3.52	2.72	69.05
1996	5.55	3.87	3.60	4.32	6.58	10.00	12.58	39.21	110.80	97.19	40.45	33.41	367.55
1997	5.09	2.70	2.71	7.71	27.54	47.91	45.39	70.52	109.05	53.66	25.89	7.08	405.27
1998	0.79	0.48	0.30	0.29	0.52	2.39	4.28	4.02	4.77	3.13	1.68	1.73	24.38
1999	4.42	3.41	0.00	0.00	6.72	12.94	19.04	22.31	21.50	4.99	3.81	3.42	102.53
2001	3.20	2.31	1.92	3.56	6.77	9.35	20.03	22.66	42.12	10.64	0.00	0.00	122.56
Average	2.65	1.58	1.08	2.60	12.92	21.21	44.83	81.42	84.86	30.84	12.03	7.06	303.07

Table 4.12: Instantaneous Peak Discharge for Karami River at Kauru Station (m^3/s)

Year	Daily Discharge 1 day before the max. recorded day (m3/s)	Max. Recorded daily discharge in that year (m3/s)	Daily Discharge 1 day after the max. recorded day (m3/s)	Instantaneous Peak Flow (m3/s)		
				Fuller (m3/sec)	Sangal (m3/sec)	Adopted
1973	170.2	**185.0**	164.4	236.1	202.8	**236.1**
1974	160.5	**210.0**	128.2	267.9	275.6	**275.6**
1975	215.3	**246.2**	215.4	314.1	277.1	**314.1**
1976	171.7	**188.4**	111.3	240.4	235.4	**240.4**
1977	107.6	**128.5**	75.4	164.0	165.6	**165.6**
1980	188.9	**212.2**	166.0	270.7	246.9	**270.7**
1991	108.9	**158.2**	81.7	201.8	221.1	**221.1**
1995	9.2	**48.0**	25.2	61.2	78.8	**78.8**
1996	64.5	**96.3**	96.3	122.8	112.2	**122.8**
1997	83.6	**146.1**	140.3	186.4	180.3	**186.4**
1998	2.0	**17.6**	7.0	22.5	30.8	**30.8**
1999	9.8	**50.3**	24.8	64.2	83.4	**83.4**
2001	7.4	**68.4**	59.6	87.2	103.2	**103.2**

4.1.5 Galma River at Ribako Station

The Ribako station at Galma River was established in 1962. The Latitude and Longitude for this station are 10°42' and 7°45' respectively. The catchment area is 6836.20 km^2.

The available data for this station is the mean daily discharge from 1972 to 1991 and the gauge height from 1972 to 1998 – excluding the years 1981, 1982, 1988, 1989 where no data is available -. In order to calculate the mean daily discharge from 1992 to 1998 a rating curve is applied. The rating curve formed from 1991 is formulated as followed: $Q = 2.5709 \cdot H^{2.3009}$. (Figure 4.6)

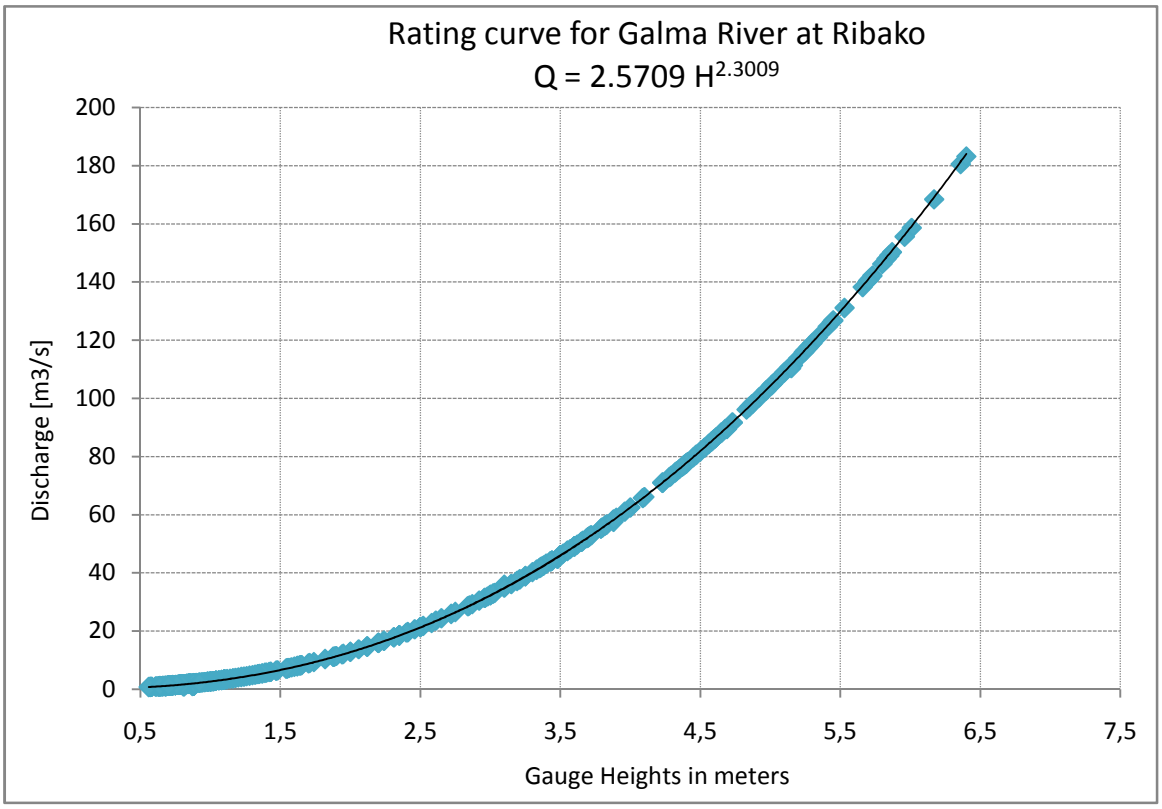


Figure 4.6: Rating Curve for River Galma at Ribako Station

The monthly discharge for the Ribako Station on Galma River is summarized in Table 4.13 and the total runoff at this station is estimated and shown in Table 4.14. The Sangal and Fuller equations are used to estimate instantaneous peak flow from mean daily flow data. The formula giving the largest value is used to estimate the instantaneous peak flow (cf. Table 4.15).

Table 4.13: Monthly Discharges for Galma River at Ribako Station (m^3/s)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1973	0.052	0.275	0.207	0.153	0.631	8.807	34.632	137.564	161.775	75.833	2.801	0.190
1974	0.037	0.187	0.229	0.337	5.975	3.483	50.263	106.245	163.746	60.377	7.313	7.419
1975	0.654	0.388	0.310	2.178	14.728	11.092	56.535	127.030	228.688	60.026	10.322	2.849
1976	0.940	0.580	0.382	1.540	4.276	18.732	49.699	92.730	75.507	83.767	31.324	5.737
1977	1.181	0.578	0.348	0.270	2.110	12.610	16.640	51.390	140.770	36.090	4.640	1.010
1979	1.153	0.330	0.349	0.273	73.080	22.247	100.773	253.143	224.066	61.685	15.500	3.184
1980	0.599	0.398	0.373	0.287	7.806	19.411	45.155	111.982	88.304	18.636	4.871	1.084
1981	2.985	2.220	1.868	2.023	13.054	26.510	52.305	114.723	211.597	32.467	10.090	5.550
1982	2.786	2.965	2.570	2.931	4.539	9.326	24.149	77.186	59.164	22.573	7.791	3.322
1983	1.484	0.721	0.238	2.543	2.771	14.634	17.299	54.958	66.982	11.475	3.792	1.418
1984	3.268	2.300	1.778	1.335	11.928	7.416	24.135	32.608	22.091	20.734	4.015	1.298
1985	0.589	0.177	0.283	3.416	6.304	26.979	73.282	144.280	91.414	133.219	5.413	2.904
1986	1.747	0.812	0.289	1.351	2.903	5.433	31.528	133.999	54.028	12.239	8.027	4.559
1987	1.620	1.200	1.380	1.040	0.910	19.700	18.600	92.680	78.590	18.890	1.110	1.370
1991	1.768	1.444	0.943	1.412	14.849	72.153	45.803	118.744	79.029	29.629	5.464	2.707
1992	1.769	0.995	0.338	0.695	6.023	9.129	26.684	85.461	175.406	45.604	9.993	2.873
1993	0.866	1.162	1.103	0.980	5.799	20.861	80.321	177.326	163.886	66.124	26.119	3.247
1994	0.921	0.346	0.215	0.623	0.818	3.087	33.078	127.538	189.301	78.177	14.532	5.178
1995	1.712	0.669	0.204	0.113	0.248	4.351	27.672	138.596	160.633	42.207	10.213	2.935
1996	0.262	0.031	0.010	0.081	0.580	13.469	72.600	154.606	200.727	123.408	8.291	3.378
1997	1.949	1.493	1.124	1.497	2.771	13.160	28.687	80.816	174.072	85.051	53.280	29.461

Table 4.14: Monthly and total runoff for Ribako Station on Galma River (mm) [5]

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
1960						*0*	*14.4*	*32.7*	*62.5*	*42.4*	*4.9*	*0.7*	
1961		*0*		*0*	*0*	*6*	*22.6*	*33.5*	*61.4*	*19.8*			
1962				*0.1*	*0.3*	*4.5*	*0*	*61.8*	*104.6*	*47.8*	*9*	*3.2*	
1963	*1.4*	*0.7*	*0.5*	*0.9*	*1.8*	*4.1*	*12.4*	*40.5*	*70*	*47.5*	*8.7*	*2.8*	*191*
1964	*1.4*	*0.7*	*0.5*	*0.4*	*1.1*	*3.7*	*15.9*	*79.3*	*107.7*	*21*	*6*	*3*	*241*
1965	*1.8*	*1.1*	*0.8*	*0.6*	*1*	*29*	*19.8*	*39.3*	*65.1*	*16.3*	*3.7*	*1.9*	*180*
1966	*1.2*	*0.7*	*0.4*	*0.5*	*5.4*	*12.4*	*11.3*	*47.8*	*73*	*43.6*	*7.9*	*3.9*	*208*
1967	*2.3*	*2.1*	*0.5*				*19.4*	*44.3*	*56.8*			*1.9*	
1968	*0.9*	*0.6*	*0.4*	*1.4*	*5.1*	*5.3*	*34.2*	*35.4*	*37.3*	*8.6*	*2.3*	*1.2*	*133*
1969	*0.8*	*0.4*	*0.4*	*0.7*	*8*	*2.7*	*18.3*	*39.3*	*47.8*	*14.8*	*9*	*0*	*135*
1970													
1971													
1972				0.2	3 .7	8.7	12.40	21.80	39.50	10.90			
1973	0.02	0.10	0.08	0.06	0.25	3.31	13.47	53.51	60.89	29.50	1.05	0.07	162.31
1974	0.01	0.07	0.09	0.13	2.32	1.31	19.55	41.33	61.64	23.48	2.75	2.89	155.57
1975	0.25	0.14	0.12	0.82	5.73	4.18	21.99	49.41	86.08	23.35	3.89	1.11	197.06
1976	0.37	0.21	0.15	0.58	1.66	7.05	19.33	36.07	28.42	32.58	11.79	2.23	140.44
1977	0.46	0.20	0.14	0.10	0.82	4.75	6.47	19.99	52.99	14.04	1.75	0.39	102.09
1979	0.45	0.12	0.14	0.10	28.43	8.37	39.20	98.46	84.34	23.99	5.83	1.24	290.67
1980	0.23	0.14	0.15	0.11	3.04	7.31	17.56	43.56	33.24	7.25	1.83	0.42	114.83
1981	1.16	0.79	0.73	0.76	5.08	9.98	20.34	44.62	79.65	12.63	3.80	2.16	181.69
1982	1.08	1.05	1.00	1.10	1.77	3.51	9.39	30.02	22.27	8.78	2.93	1.29	84.20
1983	0.58	0.26	0.09	0.96	1.08	5.51	6.73	21.38	25.21	4.46	1.43	0.55	68.23
1984	1.27	0.82	0.69	0.50	4.64	2.79	9.39	12.68	8.32	8.06	1.51	0.50	51.18
1985	0.23	0.06	0.11	1.29	2.45	10.16	28.50	56.12	34.41	51.82	2.04	1.13	188.31
1986	0.68	0.29	0.11	0.51	1.13	2.04	12.26	52.12	20.34	4.76	3.02	1.77	99.04
1987	0.63	0.43	0.54	0.39	0.35	7.42	7.23	36.05	29.58	7.35	0.42	0.53	90.92
1991	0.69	0.51	0.37	0.53	5.78	27.16	17.82	46.19	29.75	11.52	2.06	1.05	143.42
1992	0.69	0.35	0.13	0.26	2.34	3.44	10.38	33.24	66.03	17.74	3.76	1.12	139.48
1993	0.34	0.41	0.43	0.37	2.26	7.85	31.24	68.97	61.69	25.72	9.83	1.26	210.37
1994	0.36	0.12	0.08	0.23	0.32	1.16	12.87	49.61	71.26	30.41	5.47	2.01	173.90
1995	0.67	0.24	0.08	0.04	0.10	1.64	10.76	53.91	60.46	16.42	3.84	1.14	149.30
1996	0.10	0.01	0.00	0.03	0.23	5.07	28.24	60.14	75.56	48.00	3.12	1.31	221.81
1997	0.76	0.53	0.44	0.56	1.08	4.95	11.16	31.43	65.52	33.08	20.06	11.46	181.03
Average	0.52	0.33	0.27	0.45	3.37	6.14	16.85	44.70	50.36	20.71	4.39	1.70	156.81

[5] Data marked as *Italic* are taken from the Parkman (1997) study

Table 4.15: Instantaneous Peak Discharge for Galma River at Ribako Station (m^3/s)

Year	Daily Discharge 1 day before the max. recorded day (m3/s)	Max. Recorded daily discharge in that year (m3/s)	Daily Discharge 1 day after the max. recorded day (m3/s)	Instantaneous Peak Flow (m3/s)		
				Fuller (m3/sec)	Sangal (m3/sec)	Adopted
1973	230.8	**241.0**	240.5	286.8	246.3	**286.8**
1974	205.4	**226.5**	222.6	269.6	239.1	**269.6**
1975	326.3	**379.1**	374.7	451.1	407.7	**451.1**
1976	138.5	**233.2**	96.6	277.6	348.9	**348.9**
1977	229.3	**243.7**	217.1	290.0	264.1	**290.0**
1979	365.1	**473.5**	399.7	563.6	564.7	**564.7**
1980	174.0	**199.7**	156.0	237.7	234.4	**237.7**
1981	286.8	**317.6**	294.7	378.0	344.4	**378.0**
1982	120.1	**136.9**	135.4	163.0	146.2	**163.0**
1983	69.9	**115.4**	77.2	137.3	157.2	**157.2**
1984	19.8	**82.7**	21.5	98.5	144.8	**144.8**
1985	173.9	**190.2**	181.9	226.3	202.5	**226.3**
1986	155.1	**177.3**	166.8	211.0	193.6	**211.0**
1987	154.4	**161.0**	155.6	191.6	167.1	**191.6**
1991	180.4	**183.1**	155.5	217.8	198.1	**217.8**
1992	278.4	**282.6**	229.2	336.3	311.3	**336.3**
1993	275.9	**288.5**	269.2	343.3	304.4	**343.3**
1994	229.2	**265.2**	245.3	315.6	293.1	**315.6**
1995	254.7	**270.1**	239.9	321.4	292.9	**321.4**
1996	269.2	**293.6**	273.4	349.5	316.0	**349.5**
1997	222.5	**253.1**	253.1	301.2	268.4	**301.2**

4.1.6 Gurara River at Kachia Station

The Kachia station at Gurara River was established in 1970, the Latitude and Longitude for this station are 9°54' and 7°58' respectively, the catchment area is 451 km2.

The available data for this station is the mean daily discharge from 1972 to 1990 and the gauge height from 1972 to 2005 – excluding the years 1979,1980,1988,1989 where no data is available -. In order to calculate the mean daily discharge from 1991 to 2005 a rating curve is applied. The rating curve formed from 1990 is formulated as followed: $Q = 1.841H^3 + 4.421H^2 - 1.971H$ (Figure 4.7).

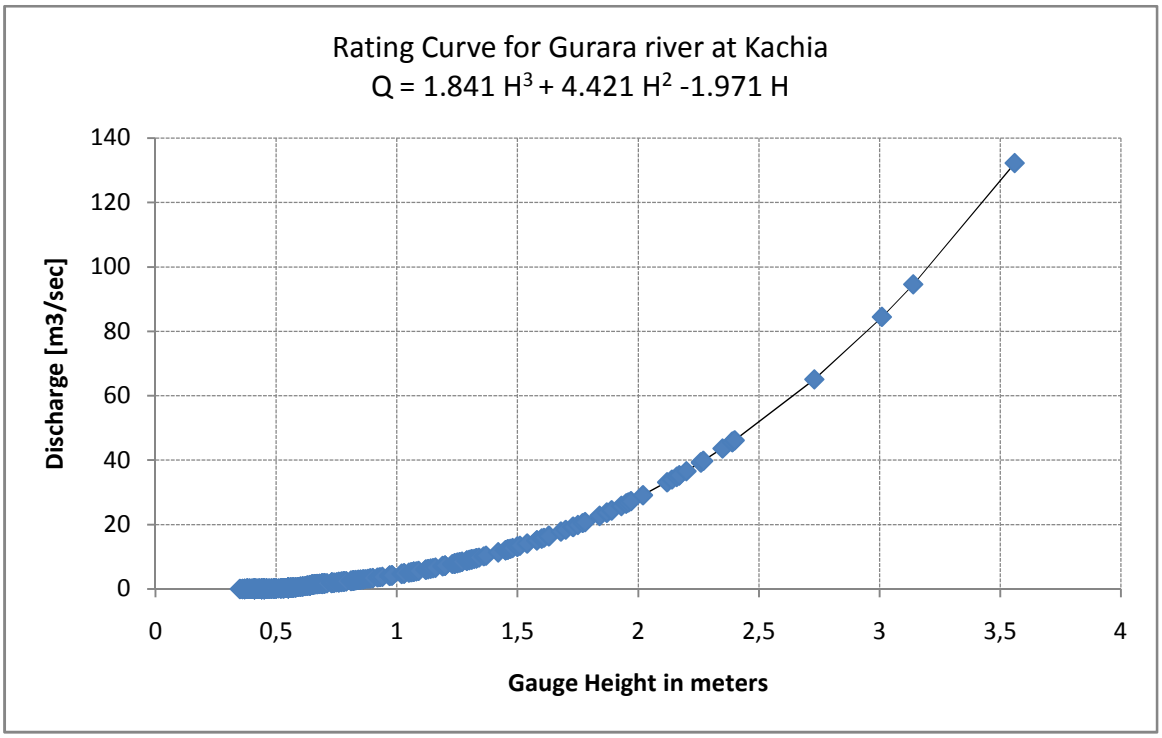


Figure 4.7: Rating Curve for River Gurara at Kachia Station

The monthly discharge for the Kachia Station on Gurara River is summarized in Table 4.16 and the total runoff at this station is estimated and shown in Table 4.17. The Sangal and Fuller equations are used to estimate instantaneous peak flow from mean daily flow data. The formula giving the largest value is used to estimate the instantaneous peak flow (cf. Table 4.18).

Table 4.16: Monthly Discharges for Gurara River at Kachia Station (m^3/s)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1983	0.79	0.60	0.48	0.63	1.60	6.80	12.17	24.92	10.81	2.87	1.04	0.48
1984	0.13	0.11	0.12	0.25	0.82	3.85	3.87	7.99	8.41	4.08	0.89	0.60
1985	0.45	0.30	0.39	0.60	1.51	4.86	7.55	20.02	11.12	2.62	0.99	0.74
1986	0.47	0.42	0.33	1.33	3.06	5.42	14.32	20.27	15.69	8.78	2.24	0.95
1987	0.10	0.06	0.01	0.01	0.09	7.70	12.91	29.45	14.80	6.73	1.04	0.35
1989	0.04	0.02	0.01	0.07	2.32	6.84	8.49	32.18	14.74	8.32	0.73	0.26
1990	0.10	0.05	0.02	0.30	2.74	4.37	8.10	23.49	19.92	6.28	1.12	0.31
1992	0.22	0.02	0.12	0.25	1.18	4.25	12.35	28.82	29.16	6.29	0.82	0.24
1994	0.27	0.02	0.01	0.98	2.64	7.20	12.23	28.89	37.20	26.60	5.04	1.45
1995	0.84	0.41	1.03	3.57	1.63	6.85	11.54	32.64	11.23	8.74	4.24	0.73
1996	0.26	0.02	0.76	0.57	9.56	8.44	23.20	28.14	26.74	6.49	2.43	1.42
1997	0.86	0.30	0.49	2.38	3.84	8.41	9.96	32.57	49.35	10.45	8.84	2.05
1998	1.09	0.60	0.38	1.43	4.18	2.75	6.66	20.04	46.73	19.22	2.14	1.09
1999	0.50	0.23	0.38	1.04	7.87	25.55	93.10	53.31	24.03	23.58	3.44	3.04
2000	1.12	0.18	0.05	3.39	18.09	21.12	12.05	36.41	21.49	21.88	2.93	0.69
2001												
2002	17.12	2.69	0.11	0.63	0.03	3.24	43.58	89.16	46.18	52.74	4.91	0.34
2003	0.02	0.01	0.01	0.22	0.59	1.22	2.43	90.50	87.31	17.44	1.41	0.27
2004	0.01	0.01	0.03	0.92	0.73	0.29	7.03	8.55	55.75	56.42	9.60	0.01
2005	0.01	0.01	0.01	0.54	0.11	0.82	10.12	32.99	26.65	7.87	0.12	0.01

Table 4.17: Monthly and total runoff for Kachia Station on Gurara River (mm) [6]

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
1970				*2.10*	*18.50*	*51.30*	*76.80*	*202.40*	*65.10*	*35.70*	*10.00*	*3.70*	
1971	*1.50*	*0.50*	*0.50*	*8.00*	*20.80*	*16.10*	*45.20*	*135.70*	*123.30*	*45.80*	*9.20*	*6.50*	413.00
1972	*1.20*	*0.80*	*0.30*	*0.30*	*28.60*	*51.30*	*127.40*	*232.10*	*137.70*	*45.80*	*11.80*	*6.70*	644.00
1973	*2.40*	*1.30*	*1.50*	*5.80*	*8.30*	*27.60*	*53.60*	*171.40*	*179.70*	*60.10*	*9.80*	*6.00*	528.00
1974	*2.40*	*1.20*	*0.80*	*6.30*	*36.90*	*24.80*	*106.50*	*145.80*	*210.20*	*43.40*	*12.80*	*7.00*	598.00
1975	*4.60*	*3.20*	*3.30*	*8.10*	*28.00*	*31.70*	*148.20*	*198.80*	*212.50*	*48.20*	*12.20*	*7.40*	706.00
1976	*3.40*	*1.40*	*0.30*	*2.30*	*22.60*	*40.90*	*75.60*	*96.40*	*92.20*	*77.40*	*22.50*	*10.10*	446.00
1977	3.60	1.60	0.60										
1983	3.64	2.50	2.20	2.83	7.37	30.27	56.00	114.70	48.16	13.20	4.63	2.21	287.70
1984	0.60	0.48	0.54	1.13	3.80	17.15	17.81	36.77	37.45	18.78	3.96	2.74	141.21
1985	2.06	1.25	1.78	2.67	6.95	21.66	34.77	92.12	49.54	12.05	4.39	3.39	232.63
1986	2.18	1.74	1.54	5.92	14.09	24.14	65.91	93.26	69.88	40.41	9.99	4.36	333.44
1987	0.46	0.25	0.05	0.04	0.41	34.29	59.41	135.53	65.91	30.97	4.63	1.61	333.58
1989	0.18	0.08	0.05	0.31	10.68	30.46	39.07	148.09	65.65	38.29	3.25	1.20	337.31
1990	0.46	0.21	0.09	1.34	12.61	19.46	37.28	108.10	88.72	28.90	4.99	1.43	303.58
1992	1.01	0.09	0.56	1.12	5.43	18.92	56.84	132.62	129.88	28.95	3.64	1.09	380.15
1994	1.26	0.08	0.05	4.37	12.14	32.05	56.30	132.96	165.69	122.39	22.45	6.68	556.44
1995	3.85	1.71	4.75	15.89	7.51	30.53	53.09	150.23	50.00	40.23	18.90	3.37	380.06
1996	1.21	0.06	3.52	2.55	43.99	37.60	106.77	129.51	119.10	29.88	10.81	6.55	491.54
1997	3.95	1.27	2.27	10.60	17.68	37.46	45.85	149.88	219.78	48.11	39.37	9.43	585.65
1998	5.02	2.53	1.75	6.39	19.22	12.23	30.66	92.23	208.12	88.47	9.55	5.00	481.15
1999	2.29	0.98	1.77	4.63	36.20	113.81	428.44	245.33	107.03	108.50	15.34	13.98	1078.31
2000	5.14	0.77	0.24	15.12	83.25	94.04	55.44	167.54	95.73	100.71	13.07	3.16	634.20
2001													
2002	78.81	11.28	0.50	2.82	0.15	14.42	200.57	410.30	205.66	242.69	21.87	1.54	1190.62
2003	0.09	0.04	0.05	0.96	2.73	5.43	11.17	416.51	388.87	80.24	6.26	1.23	913.58
2004	0.06	0.04	0.16	4.12	3.37	1.30	32.33	39.36	248.27	259.63	42.75	0.05	631.43
2005	0.05	0.04	0.05	2.39	0.51	3.64	46.57	151.82	118.70	36.21	0.55	0.05	360.56
Average	4.87	1.31	1.08	4.37	16.73	30.47	76.58	152.94	129.73	63.89	12.17	4.31	498.46

[6] Data marked as *Italic* are taken from the Parkman (1997) study

Table 4.18: Instantaneous Peak Discharge for Gurara River at Kachia Station (m^3/s)

Year	Daily Discharge 1 day before the max. recorded day (m3/s)	Max. Recorded daily discharge in that year (m3/s)	Daily Discharge 1 day after the max. recorded day (m3/s)	Instantaneous Peak Flow (m3/s)		
				Fuller (m3/sec)	Sangal (m3/sec)	Adopted
1983	8.8	**181.8**	14.2	253.3	352.0	**352.0**
1984	7.2	**41.1**	7.0	57.3	75.1	**75.1**
1985	6.9	**105.6**	10.7	147.2	202.4	**202.4**
1986	67.6	**121.2**	19.9	168.9	198.6	**198.6**
1987	5.6	**205.6**	22.4	286.6	397.2	**397.2**
1989	4.5	**336.3**	136.2	468.7	602.2	**602.2**
1990	45.6	**132.2**	43.6	184.3	219.8	**219.8**
1992	133.1	**167.6**	68.2	233.6	234.5	**234.5**
1994	13.2	**260.6**	257.5	363.2	385.8	**385.8**
1995	29.2	**153.0**	33.2	213.2	274.7	**274.7**
1996	65.0	**171.1**	24.5	238.5	297.4	**297.4**
1997	28.1	**289.3**	6.2	403.3	561.5	**561.5**
1998	68.2	**284.4**	69.6	396.4	499.9	**499.9**
1999	252.9	**679.6**	651.1	947.2	907.1	**947.2**
2000	57.1	**126.2**	46.2	175.9	200.7	**200.7**
2001	811.4	**912.6**	888.3	1272.1	975.4	**1272.1**
2002	180.7	**245.4**	174.7	342.1	313.2	**342.1**
2003	296.0	**408.2**	219.6	568.9	558.5	**568.9**
2004	252.9	**318.3**	263.7	443.7	378.4	**443.7**
2005	41.3	**189.3**	189.3	263.9	263.4	**263.9**

4.2 Frequency analysis of peak discharge

Eighteen statistical distributions are available to fit data sets that are independent, homogenous and stationary. Distributions that are usually used in flood frequency analysis can be grouped in three main classes:

- Class C (regularly varying distributions): Fréchet (EV2), Halphen Invese B (HIB), Log-Pearson (LP3), Inverse Gamma (IG).

- Class D (sub-exponential distributions): Halphen type A (HA), Halphen type B (HB), Gumbel (EV1), Pearson type 3 (P3), Gamma (G).

- Class E (Exponential distribution).

The tail of the class C distributions is heavier than that of the class D distributions, which is heavier than that of the class E. Thus, estimated quantiles can be ordered equivalently. Indeed, for a given sample, the T-event corresponds to the quantile of the probability of exceedance p=1 - 1/T estimated by distributions of the classes C, D and E, are QT (C), QT (D) and QT (E) respectively, which verify the following relation: QT (E) < QT (D) < QT (C).

The methods, that allow the identification of the most adequate class of distribution to fit a given sample especially for extremes, are:

- The Log-Log plot: used to discriminate between on the one hand the class C and on the other hand the classes E and D;

- The mean excess function (MEF): to discriminate between the classes D and E; and

- Two statistics: Hill's ratio and modified Jackson statistic, for confirmatory analysis of the conclusions suggested by the previous two methods.

o To check the linearity of the curve in the Log-Log plot, a test on the associated correlation coefficient is considered. Simulation studies allow the determination of critical values corresponding to significance levels of 5 % and 1 %, to test that

the data follow a distribution of the class C (i.e. the curve is linear).

These critical values are calculated according to the size N of the sample (30 <= N <= 200).

o If the hypothesis H0 is rejected, at the significance level 5 %, it is suggested to use the mean excess function plot (MEF).

o Indeed, if the observed correlation coefficient (□o) is greater than critical value (□c) at the significance level 5 %, then it can be concluded that the hypothesis H0 of linearity is accepted. In this case, the most adequate choice corresponds to the class C of regularly varying distributions (power-law type): Halphen type IB (HIB), Fréchet (EV2), Log-Pearson type 3 (LP3), Inverse Gamma (IG).

The use of the Mean Excess Function (MEF) plot is based on the slope of the curve for the observations that exceed the median (50 % of the highest observed value of the sample). Simulation studies allow the determination of critical values corresponding to significance levels of 5 % and 1 %, to test that

the data follow a distribution of the class e (i.e. the slope of the MEF is equal to zero).

These critical values are calculated according to the size N of the sample (30 <= N <= 200).

When the hypothesis H0 is accepted, it is suggested to use the Exponential distribution (class E). However, when it is rejected at the significance level 5 %, it is suggested to use a distribution of the class D (sub-exponential distributions, such as Halphen type A, Extreme Value Distribution type 1 (Gumbel), Pearson type 3, or Gamma).

In the following sub-sections, analysis of peak discharge at every available station involves first:

1. Log-log plot to choose between Class C and Classes E/D
2. Mean excess function to choose between Class D and Class E

The two types of plots confirm that the class of distribution to be adopted is always Class D whatever the station analyzed. The two plots are presented on Figures 4.8 (a and b) as an example of the application of the methodology. As such, Gumbel, Gamma and Pearson type III distributions (which are the most common ones in flood

frequency analysis) are tested. To choose among these 3 distributions, a Bayesian approach is used to compare between the fitted four distributions. Two criteria, namely the Bayesian Information Criterion (BIC) and the Akaike Information Criterion (AIC), are estimated for the fitted distributions, both of them are based on the deviation between the fitted distribution and the empirical probability and also a penalization that is function of the number of parameters of the distribution and the sample size.

Bayesian Information Criterion (BIC) is calculated as:

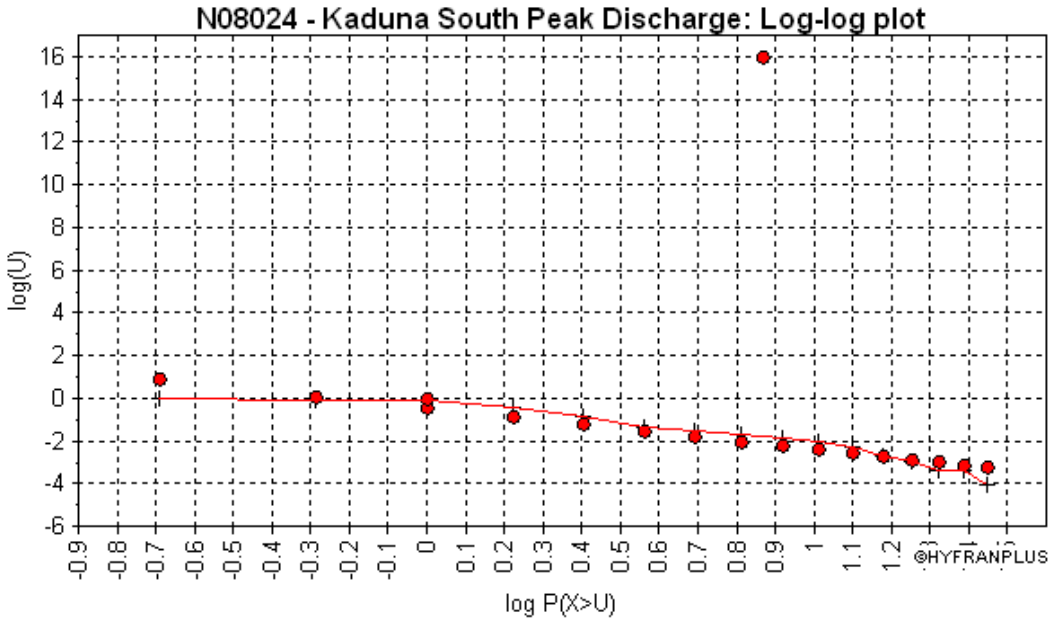
BIC = -2 log (L) +2 k log(n)

Akaike Information Criterion (AIC) is calculated as:

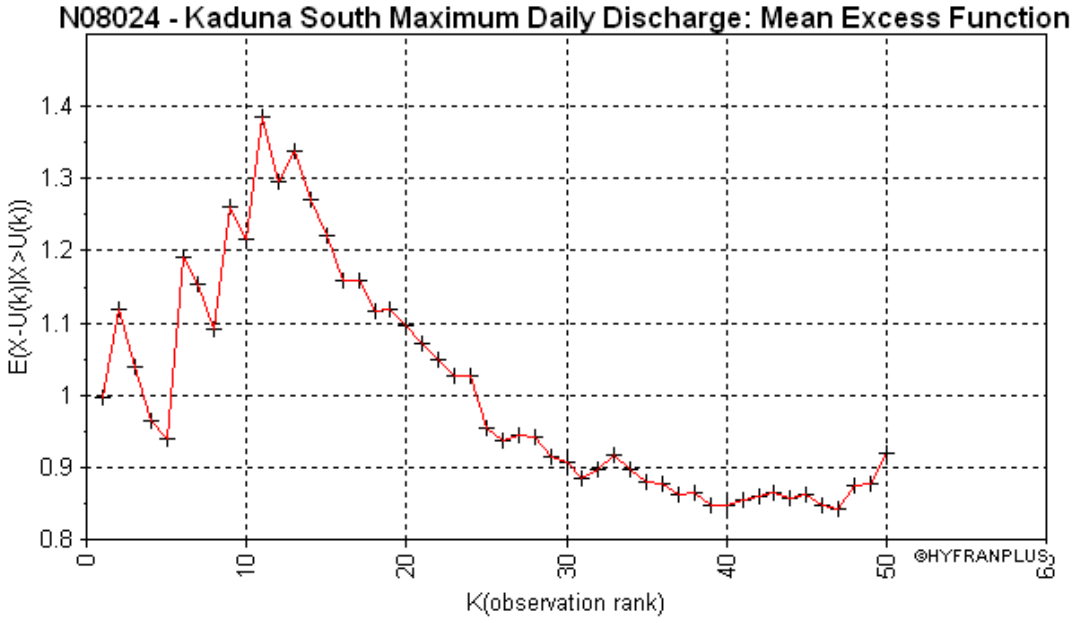
AIC = -2 log (L) +2 k

where L is the likelihood, k is the number of parameters and n is the sample size.

Using the above criteria, stations Bakin Kogi and Kachia were found to be best fitted by a Gamma distribution, while for Kaduna South, Tubo, Ribako, Kauru stations Gamma and Gumbel distributions yielded similar results of BIC and AIC. The distribution giving the highest quantiles, which is the Gumbel distribution for these four stations, was adopted to be on the safe size. The details of the frequency analysis fittings for all stations and the best fit distribution results are illustrated and listed in Figures 4.9 to 4.14 and Table 4.19.

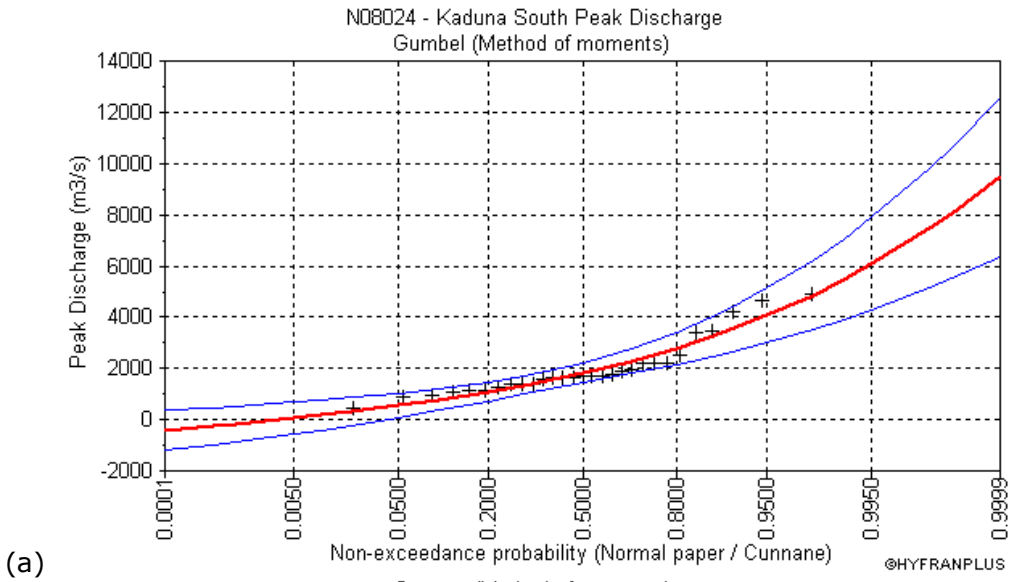


(a)

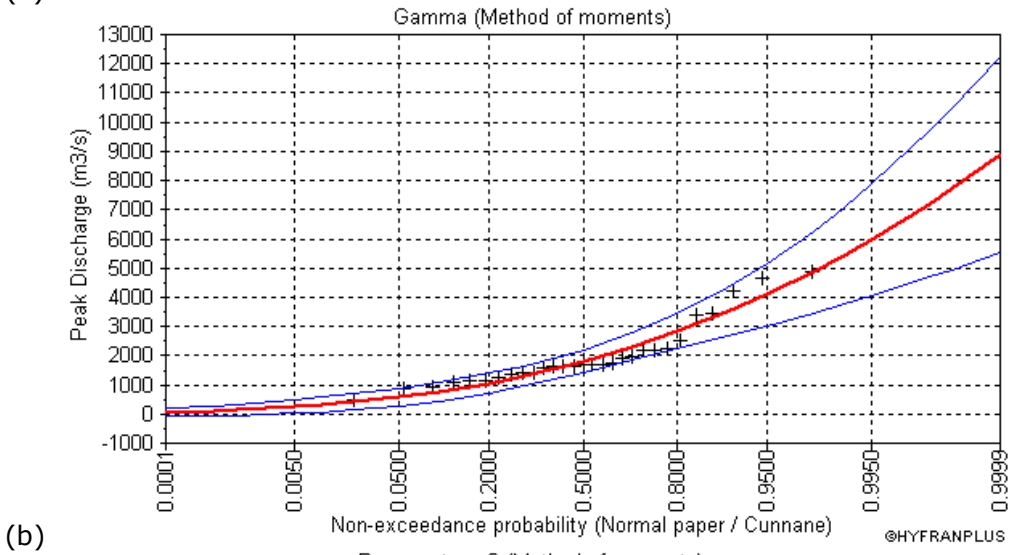


(b)

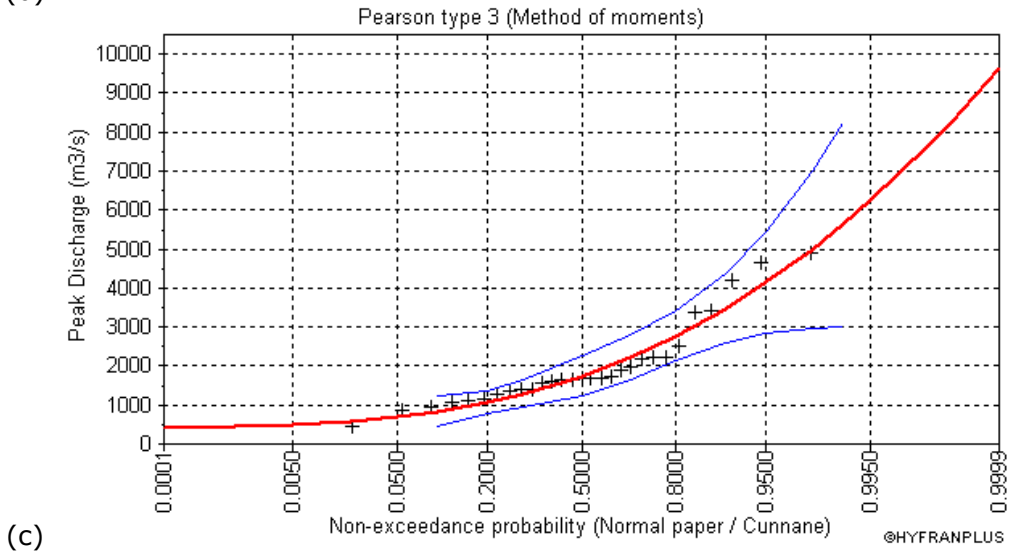
Figure 4.8: For Kaduna South Station
(a) Log-Log plot
(b) Mean Excess Function plot



(a)

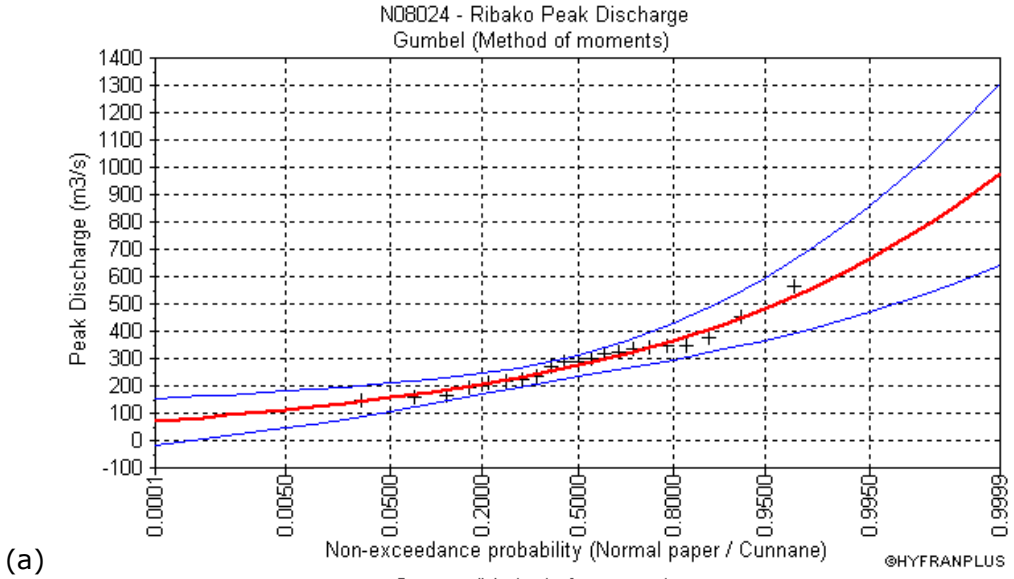


(b)

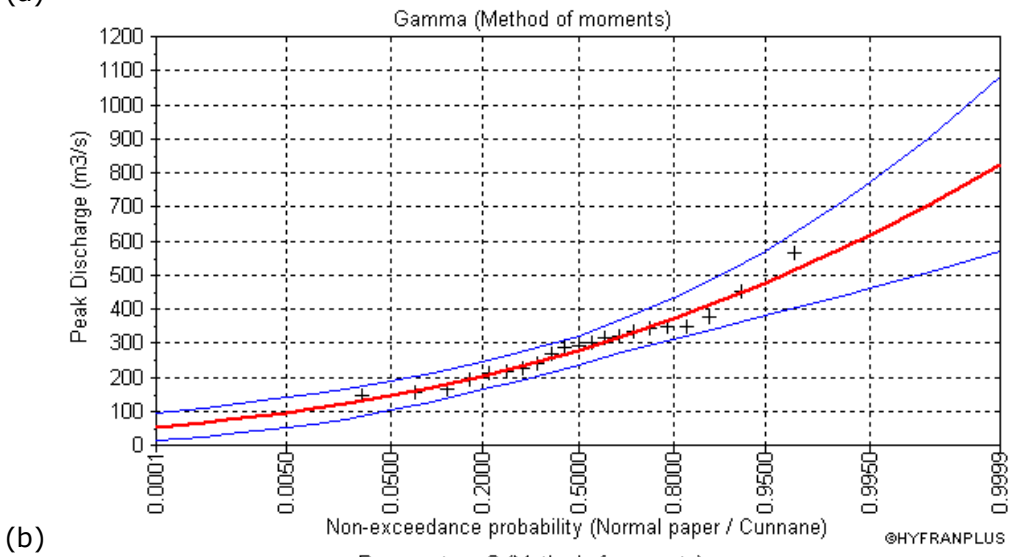


(c)

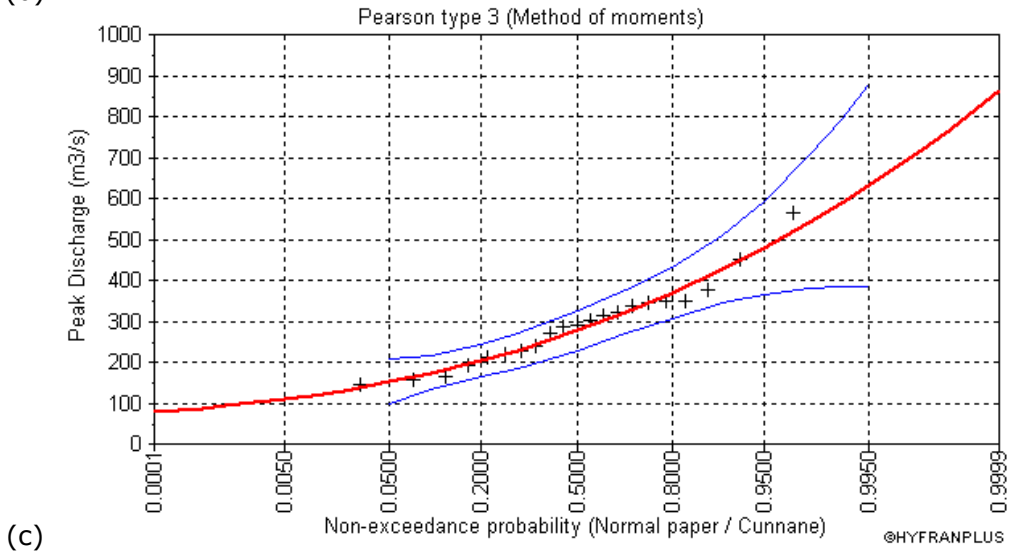
Figure 4.9: Frequency analysis of Peak Discharge at Kaduna South Station



(a)

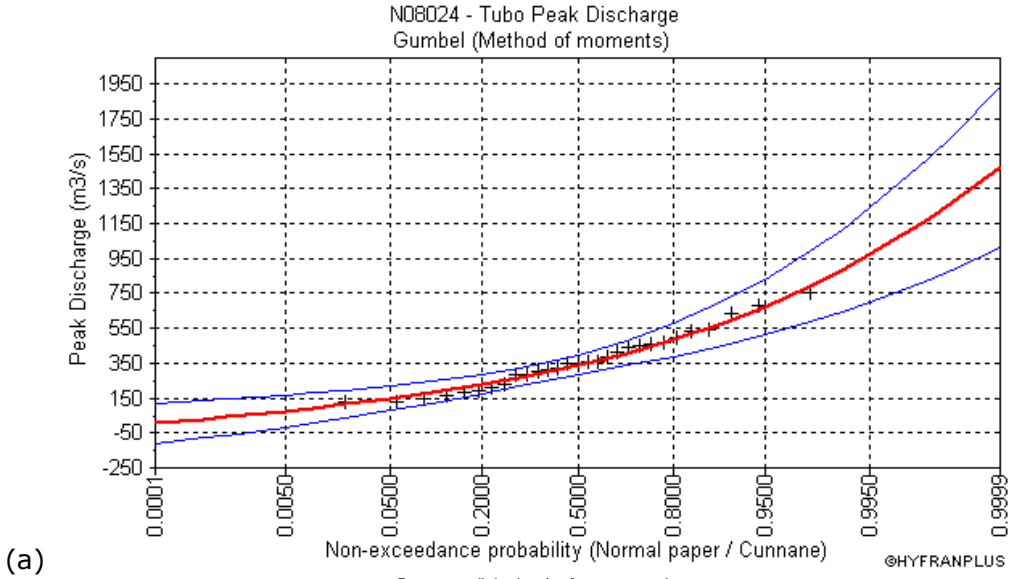


(b)

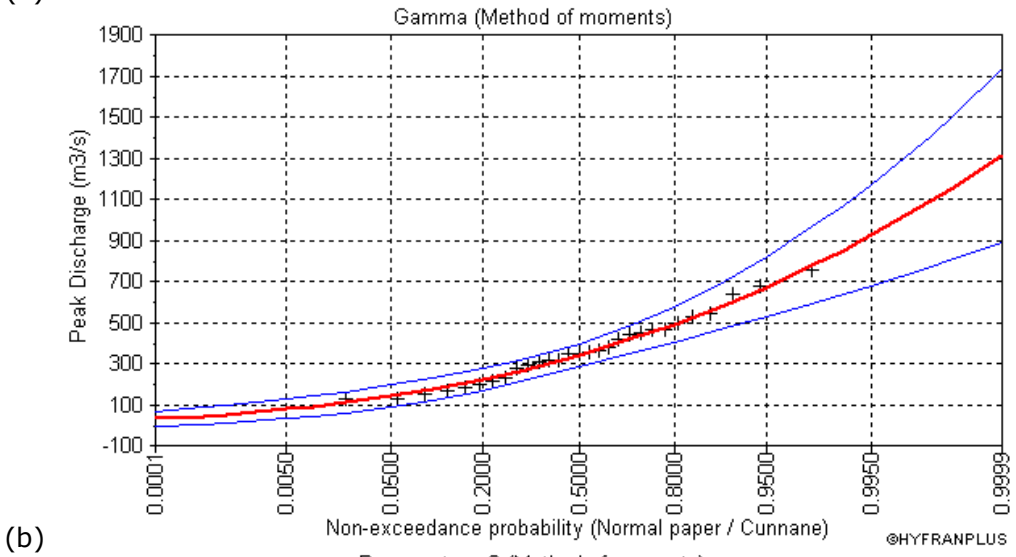


(c)

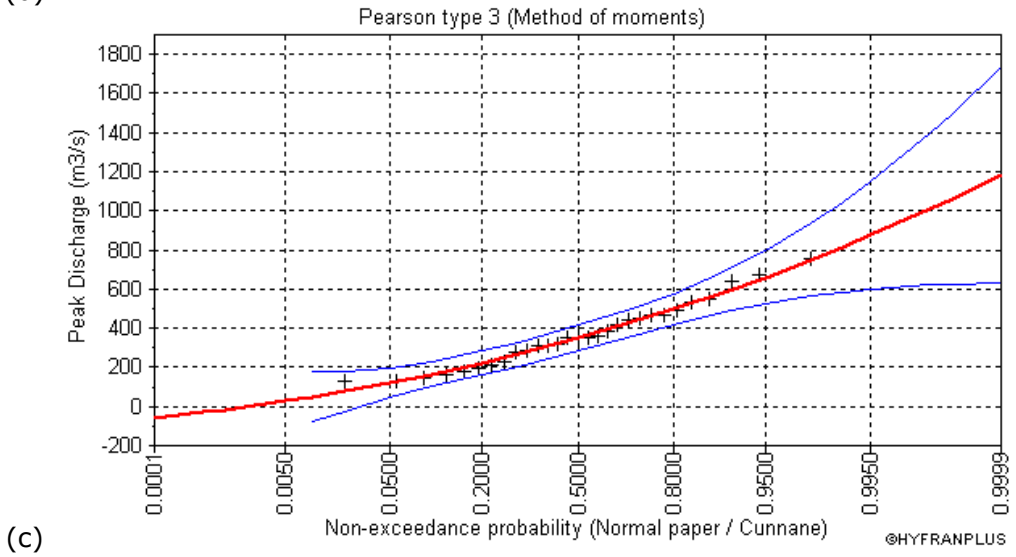
Figure 4.10: Frequency analysis of Peak Discharge at Ribako Station



(a)

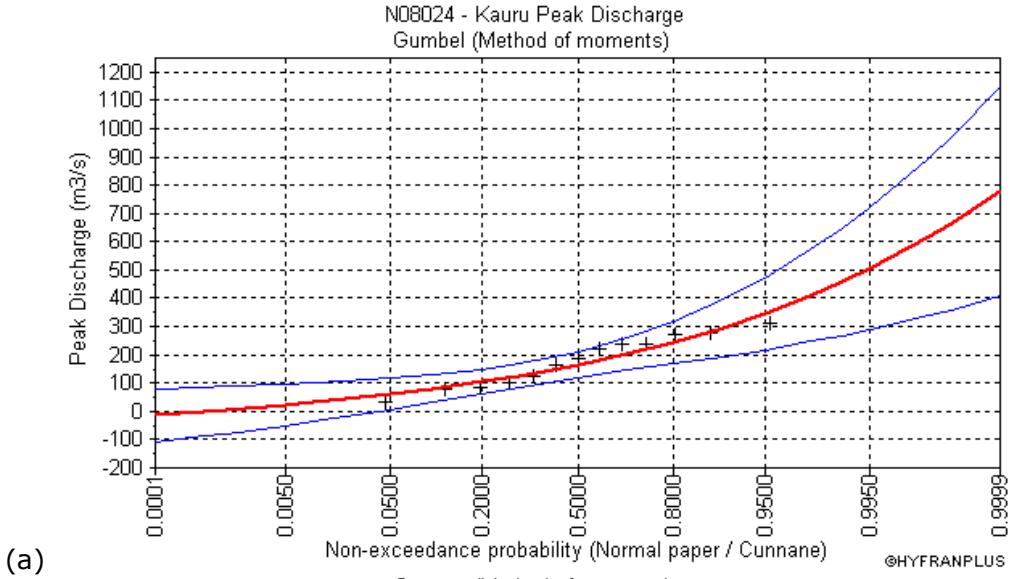


(b)

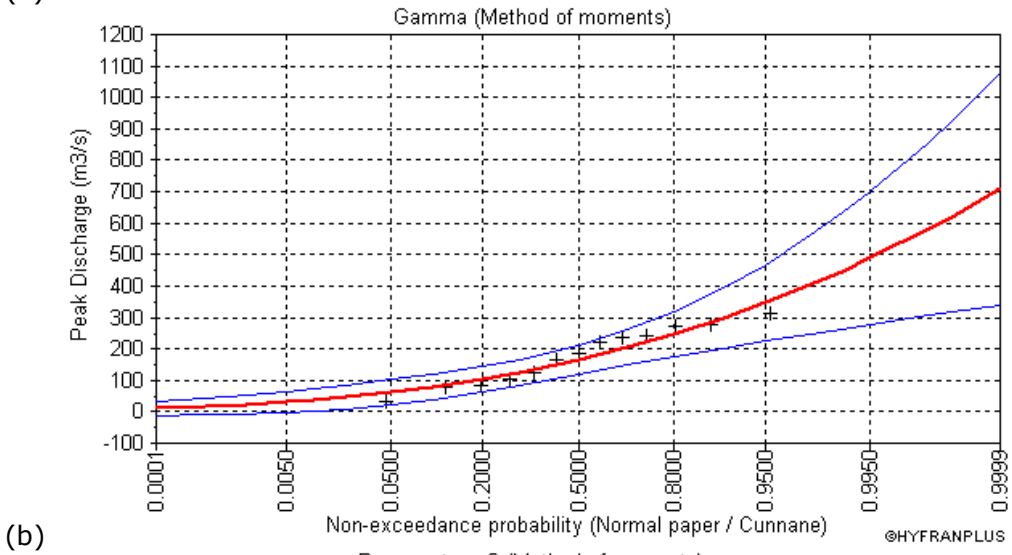


(c)

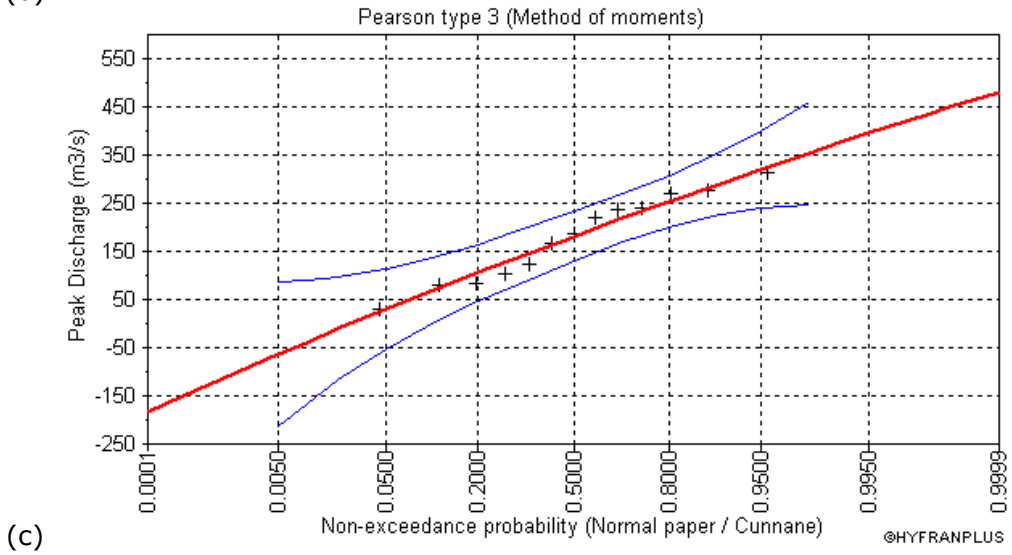
Figure 4.11: Frequency analysis of Peak Discharge at Tubo Station



(a)

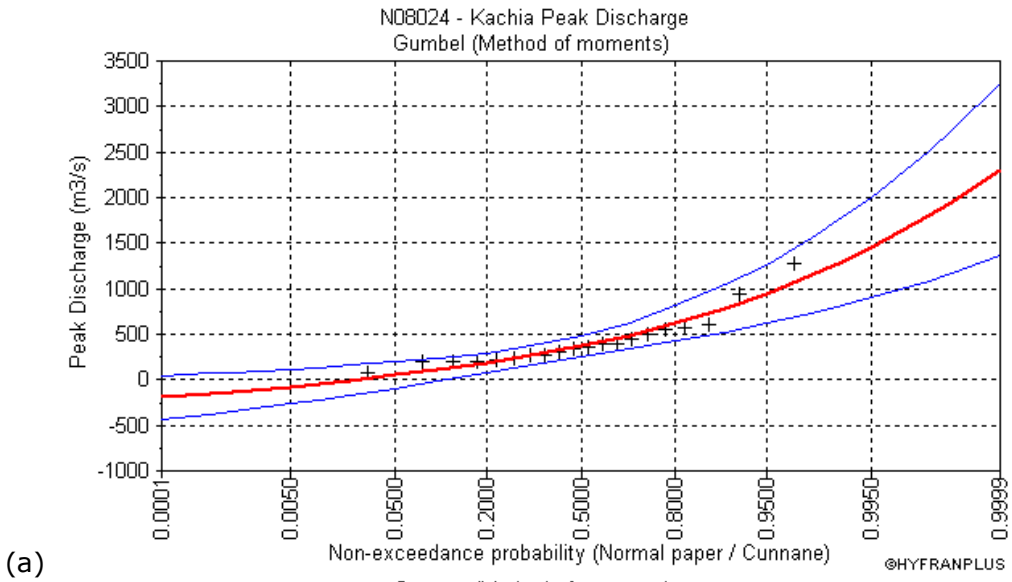


(b)

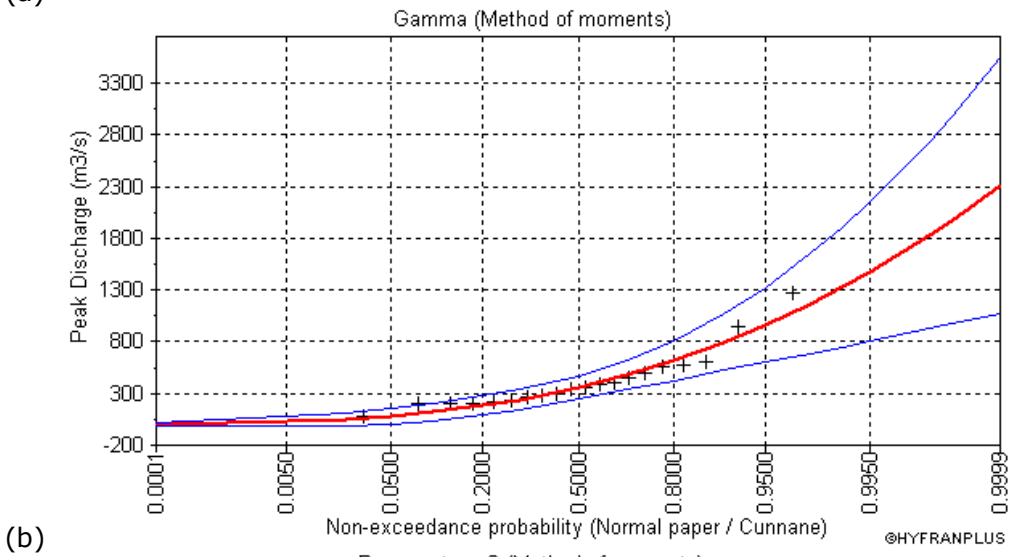


(c)

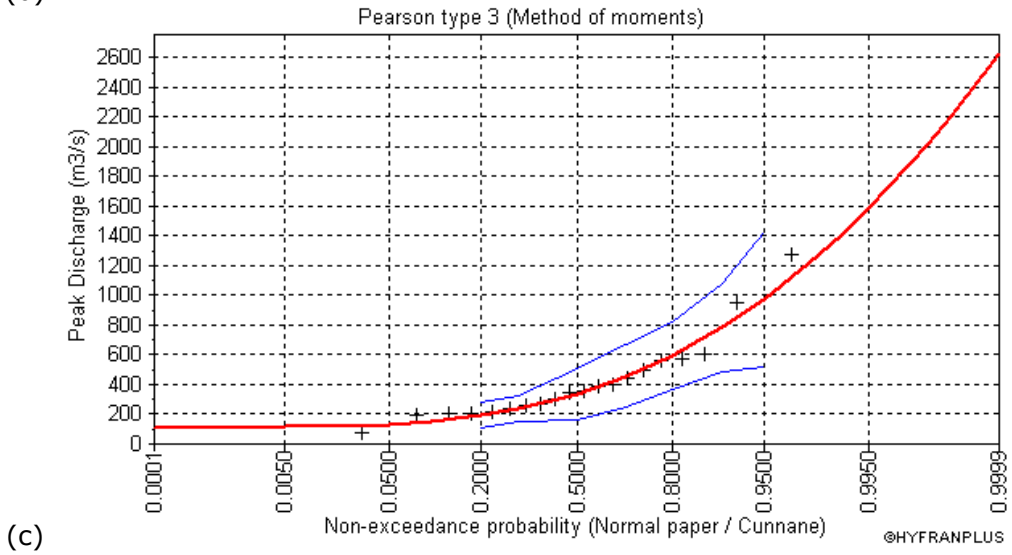
Figure 4.12: Frequency analysis of Peak Discharge at Kauru Station



(a)

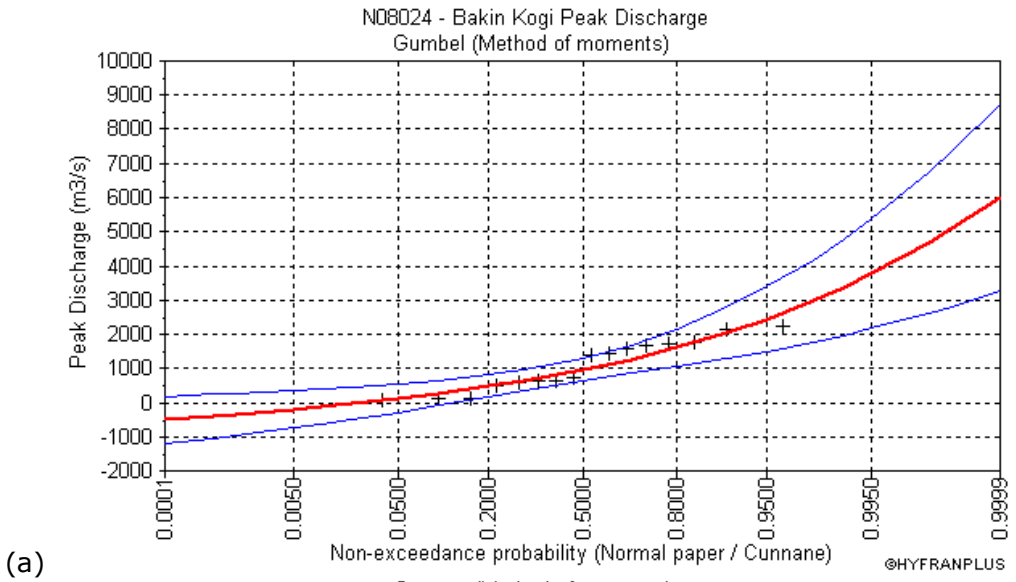


(b)

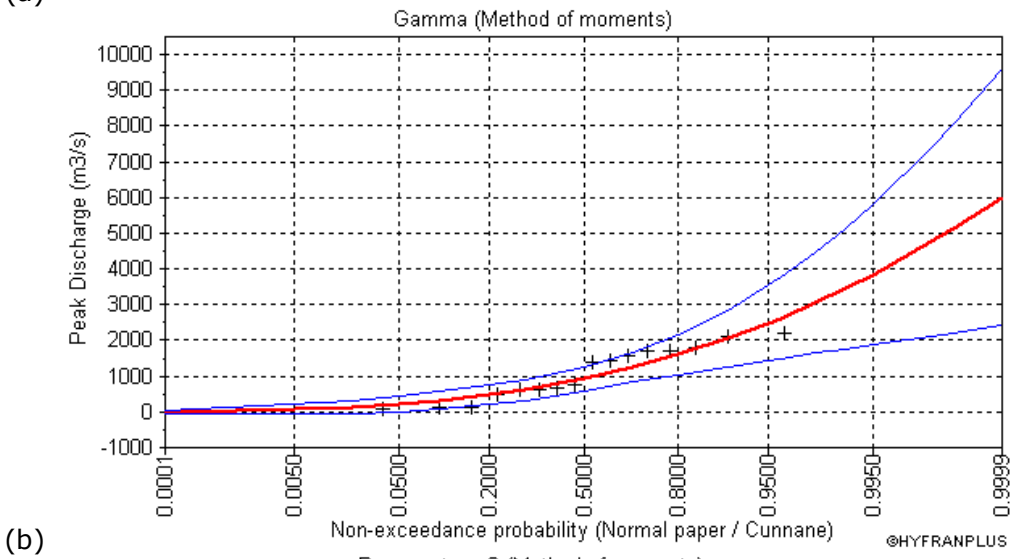


(c)

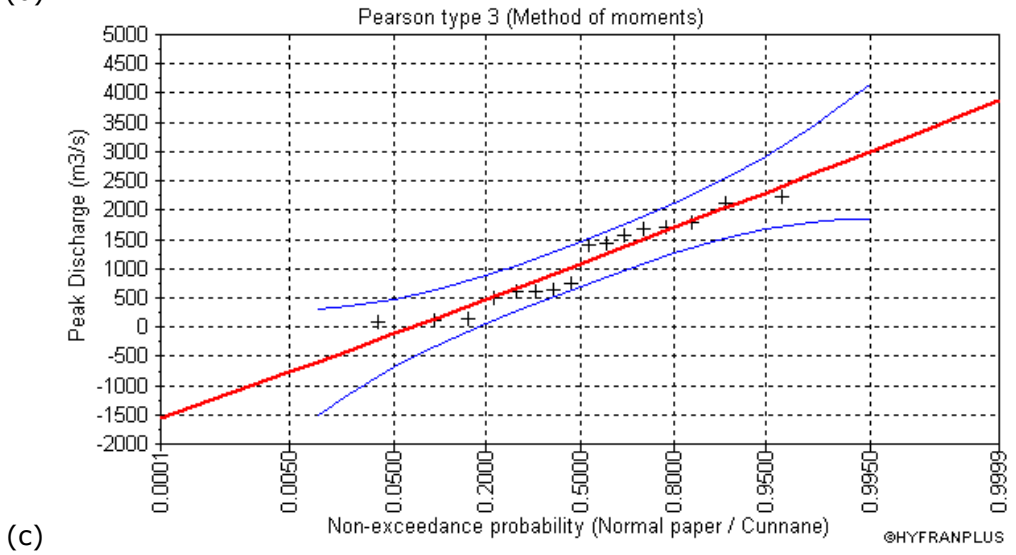
Figure 4.13: Frequency analysis of Peak Discharge at Kachia Station



(a)



(b)



(c)

Figure 4.14: Frequency analysis of Peak Discharge at Bakin Kogi Station

Table 4.19: Frequency analysis results of peak discharge at various stations showing the average estimate and its standard deviation

Return Period	Gumbel fitting								Gamma fitting			
	Kaduna South		Kauru		Ribako		Tubo		Kachia		Bakin Kogi	
	Average	Std. Dev.	Average	Std. Dev.	Average	Std. Dev.	Average	Std. Dev.	Average	Std. Dev.	Average	Std. Dev.
10000	9460	1580	778	189	974	169	1470	234	2310	629	6010	1960
1000	7470	1190	619	143	792	128	1180	177	1830	460	4750	1420
100	5470	808	458	96.9	609	86.9	882	120	1330	295	3450	899
50	4870	694	410	83.2	554	74.6	792	103	1170	246	3040	746
25	4260	580	361	69.5	498	62.4	702	86.2	1010	198	2630	597
20	4060	543	345	65.1	480	58.4	672	80.8	959	183	2460	550
10	3440	430	295	51.5	423	46.2	580	63.9	793	138	2010	409
5	2790	318	243	38.2	364	34.2	483	47.3	617	97	1540	282

4.3 Rainfall Runoff Transformation at Selected Sites

The United States Soil Conservation Services (SCS; now the National Resources Conservation Service, NRCS) Curve Number (CN) method is adopted for rainfall runoff transformation for the dam sites with areas less than 2000 km^2. This method takes into consideration the catchment characteristics, which include area, antecedent moisture conditions, type of soils, initial abstraction of rainfall and land use.

In the SCS - CN method of runoff prediction, a curve number is chosen to represent the land use/land cover and soil type complexes. This number typically ranges from 25 (for low runoff depressions) to 98 (for paved impervious areas). An initial abstraction factor Ia can be specified. The SCS-CN method typically uses an initial abstraction of 0.2 S. The value of S is a maximum soil storage depth (in mm) and is calculated from the following equation:

$$S = 25.4 * \left(\frac{1000}{CN} - 10 \right)$$

where CN is the Curve Number; and S is the maximum storage depth (in mm).

The SCS-CN method calculates the volume of runoff given the rainfall and the CN. The relation is given by:

$$\text{Rainfall Excess} = \frac{(P - 0.2 * S)^2}{(P + 0.8 * S)}$$

where Rainfall Excess is the accumulated depth of run-off (mm); P is the accumulated depth of daily storm rainfall (mm); and S is as defined earlier.

The Soil Conservation Service (SCS) proposed a parametric Unit Hydrograph model to transform the rainfall excess. The model is based upon averages of UH derived from gauged rainfall and runoff for a large number of small agricultural watersheds throughout the US. It is a dimensionless, single-peaked UH.

The actual peak discharge, Qp, corresponding to the rainfall excess is calculated as follows:

Qp = Rainfall Excess * peak ordinate of the UH

The time to peak (also known as the time of rise) is related to the duration of the unit of excess precipitation as:

$Tp = (\Delta t/2) + T_{lag}$

in which Δt = the excess precipitation duration (which is also the computational interval); and T_{lag} = the basin lag, defined as the time difference between the center of mass of rainfall excess and the peak of UH. For ungaged watersheds, the SCS suggests that the UH lag time may be related to time of concentration, Tc, as:

$T_{lag}=0.6 * Tc$

SECTION 5: HYDROLOGIC CALCULATIONS FOR POTENTIAL DAM SITES

5.1 Site 1: Upper Tubo

This site is also located on the Tubo River some 24 km upstream of Yula Buruku site. The site is draining a catchment of 2950 km^2. For the peak discharge at different return periods, it is assumed – as a first trial - equal to the peak discharge at the Miles 20 Lagos Road Station (Table 5.1). These values are checked against the results of hydrologic simulations using the SCS method. The hydrologic simulation shows that due to flat slopes of the river reaches, the effect of hydrologic routing through the river tends to flatten the hydrograph as it is shown by Figure 5.1 illustrating the hydrologic simulation. As for the monthly discharge, it is calculated as the runoff of the previously mentioned station multiplied by the catchment area (Table 5.2).

Table 5.1: Peak discharge for spillway design for Upper Tubo site (m^3/s)

Return Period	Discharge at station site	SCS based Discharge	Design Discharge
10000	1470	3584	3584
1000	1180	1854	1854
100	882	1624	1624
50	792	1155	1155
25	702	732	732
20	672	675	675
10	580	561	561
5	483	405	405

Table 5.2: Monthly discharge for Upper Tubo site (m^3/s)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1960						0.00	15.86	36.02	71.13	46.70	5.58	0.77
1961		0.00		0.00	0.00	6.83	24.89	36.90	69.88	21.81		
1962				0.11	0.33	5.12	0.00	68.07	119.05	52.65	10.24	3.52
1963	1.54	0.85	0.55	1.02	1.98	4.67	13.66	44.61	79.67	52.32	9.90	3.08
1964	1.54	0.85	0.55	0.46	1.21	4.21	17.51	87.34	122.58	23.13	6.83	3.30
1965	1.98	1.33	0.88	0.68	1.10	33.01	21.81	43.29	74.09	17.95	4.21	2.09
1966	1.32	0.85	0.44	0.57	5.95	14.11	12.45	52.65	83.08	48.02	8.99	4.30
1967	2.53	2.54	0.55				21.37	48.79	64.65			2.09
1968	0.99	0.73	0.44	1.59	5.62	6.03	37.67	38.99	42.45	9.47	2.62	1.32
1969	0.88	0.48	0.44	0.80	8.81	3.07	20.16	43.29	54.40	16.30	10.24	0.00
1972				0.23	4.08	9.90	13.66	24.01	44.96	12.01		
1972		0.12	0.11	0.42	3.01	4.05	3.05	44.71	32.41	6.60	2.38	0.91
1973	0.53	0.07	0.04	0.38	0.73	1.70	4.43	24.10	30.88	8.50	1.02	0.77
1974	1.08	1.14	0.82	0.30	1.17	1.55	8.66	49.60	87.20	21.91	1.49	0.55
1975	0.47	0.36	0.25	0.59	4.36	2.99	16.38	29.06	92.10	15.14	2.38	1.00
1976	0.58	0.89	0.34	0.79	2.85	8.02	24.89	33.99	18.48	29.00	8.19	1.52
1977	0.73	0.39	0.09	0.16	0.15	4.11	4.45	16.87	54.99	10.66	0.81	0.33
1978	0.13	0.12	0.10									
1980	0.40	0.16	0.13	0.10	0.84	5.41	11.82	33.54	16.24	2.96	0.44	0.23
1981	0.19	0.18	0.13	0.16	2.81	3.29	13.16	53.05	64.90	4.95	0.89	0.42
1982	0.35	0.30	0.29	0.32	0.94	4.20	10.29	36.16	41.79	8.13	0.89	0.34
1983	0.28	0.24	0.22	0.17	0.17	2.64	7.48	25.55	28.61	3.81	0.40	0.26
1984	0.22	0.19	0.18	0.17	1.82	5.70	12.96	31.03	25.05	25.21	1.22	0.33
1985	0.25	0.22	0.67	0.69	2.85	3.98	27.40	100.29	49.93	8.13	0.47	0.32
1986	0.24	0.21	0.20	0.10	1.11	4.89	17.02	66.50	112.58	17.16	4.22	2.46
1990	0.85	0.60	0.83	0.68	2.61	6.17	44.17	44.96	67.83	7.02	2.14	1.50
1991	1.20	1.05	0.94	0.79	13.15	27.74	25.82	51.72	58.43	13.92	2.33	1.42
1992	1.11	0.95	0.78	2.06	11.27	5.85	15.99	47.60	91.99	10.40	2.72	1.45
1993	1.12	0.93	0.89	0.94	5.89	9.69	43.19	77.38	81.82	7.31	2.95	1.18
1994	1.07	0.98	0.90	0.85	4.11	18.01	14.37	55.06	54.68	52.93	5.18	1.74
1995	1.56	1.18	1.06	1.58	2.89	8.39	23.02	35.93	68.38	12.04	2.32	1.40
1996	1.08	1.08	0.97	0.83	0.97	10.86	33.67	62.68	75.20	25.01	3.66	1.88
1997	1.27	0.94	1.08	1.65	4.43	15.81	20.09	61.98	96.85	21.37	4.40	1.86
1998	1.43	1.05	0.91	1.78	3.00	14.09	28.25	101.93	88.08	45.57	5.50	2.58
1999	1.80	1.39	1.16	1.00	2.15	10.33	57.96	70.61	69.68	21.63	3.20	1.73
2000	1.28	1.14	0.95	1.14	8.77	59.46	43.13	47.72	78.58	11.82	1.88	1.04
2001	0.41	0.19	0.11	0.35	67.60	39.00	17.83	37.21	133.98	6.85	0.41	0.09
2002	0.02	0.00	0.59	0.60	4.58	4.54	15.45	49.34	37.38	22.92	2.98	2.42
2003	1.02	0.62	0.20	0.24	0.45	4.01	23.06	119.19	124.70	9.57	1.43	0.58
2004	0.21	0.10	0.03	0.44	3.26	10.64	44.23	61.44	64.72	17.40	3.07	0.51
2005	0.33	0.28	0.04	0.09	1.96	2.29	13.68	38.87	19.53	12.42	0.86	0.04

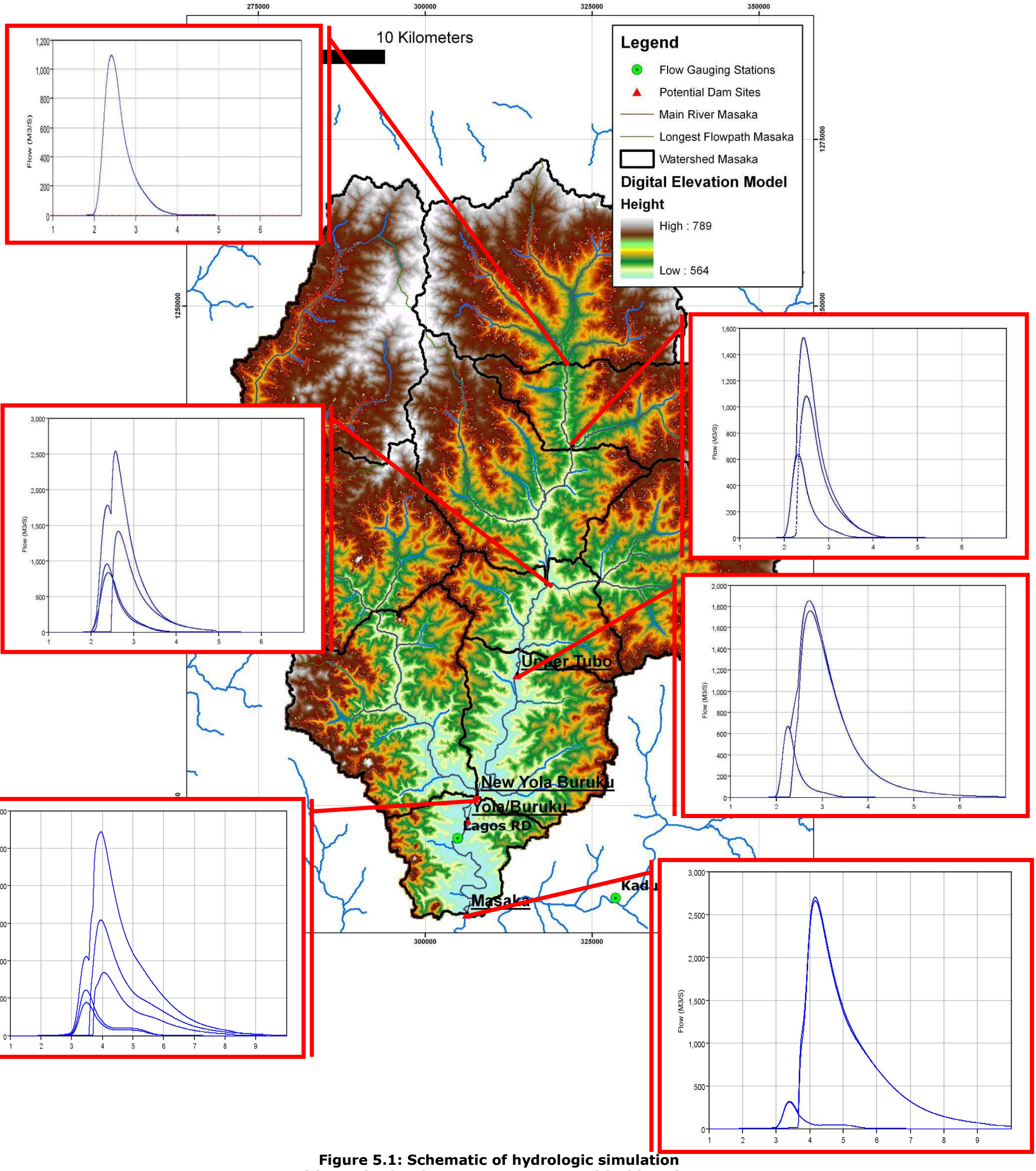


Figure 5.1: Schematic of hydrologic simulation with results for the 1000-yr event at critical locations

5.2 Site 2: Yola Buruku and Site 1b: New Yola Buruku

Both sites are located on the Tubo River some 25 km west of Kaduna City. These sites are draining catchments of 5621 and 5587 km^2, respectively. For the peak discharge at different return periods, it is assumed – as a first trial - equal to the peak discharge at the Miles 20 Lagos Road Station (Table 5.3). These values are checked against the results of hydrologic simulations using the SCS method. The hydrologic simulation shows that due to flat slopes of the river reaches, the effect of hydrologic routing through the river tends to flatten the hydrograph. As for the monthly discharge – for both alternatives -, it is calculated as the runoff of the previously mentioned station multiplied by the catchment area (Table 5.4).

Table 5.3: Peak discharge for spillway design for Yolu Buruku and New Yolu Buruku sites (m^3/s)

Return Period	Discharge at station site	SCS based Discharge	Design Discharge
10000	1470	4016	4016
1000	1180	2717	2717
100	882	1643	1643
50	792	1340	1340
25	702	1086	1086
20	672	1022	1022
10	580	789	789
5	483	582	582

Table 5.4: Monthly discharge for Yolu Buruku and New Yolu Buruku sites (m^3/s)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1960						0.00	30.11	68.37	135.03	88.65	10.59	1.46
1961		0.00		0.00	0.00	12.96	47.25	70.04	132.65	41.40		
1962				0.22	0.63	9.72	0.00	129.21	225.99	99.94	19.44	6.69
1963	2.93	1.61	1.05	1.94	3.76	8.86	25.93	84.68	151.23	99.31	18.80	5.85
1964	2.93	1.61	1.05	0.86	2.30	7.99	33.24	165.80	232.69	43.91	12.96	6.27
1965	3.76	2.52	1.67	1.30	2.09	62.65	41.40	82.17	140.65	34.08	7.99	3.97
1966	2.51	1.61	0.84	1.08	11.29	26.79	23.63	99.94	157.72	91.16	17.07	8.15
1967	4.81	4.82	1.05				40.56	92.62	122.72			3.97
1968	1.88	1.38	0.84	3.02	10.66	11.45	71.51	74.01	80.59	17.98	4.97	2.51
1969	1.67	0.92	0.84	1.51	16.73	5.83	38.26	82.17	103.27	30.94	19.44	0.00
1972				0.43	7.74	18.80	25.93	45.58	85.34	22.79		
1972		0.23	0.21	0.80	5.71	7.69	5.79	84.87	61.53	12.52	4.52	1.74
1973	1.00	0.14	0.08	0.71	1.38	3.22	8.41	45.75	58.61	16.14	1.94	1.46
1974	2.05	2.16	1.55	0.56	2.22	2.94	16.43	94.15	165.54	41.59	2.83	1.05
1975	0.90	0.69	0.48	1.12	8.28	5.68	31.09	55.16	174.83	28.75	4.52	1.90
1976	1.11	1.70	0.65	1.49	5.42	15.23	47.25	64.52	35.09	55.05	15.56	2.89
1977	1.38	0.73	0.17	0.30	0.29	7.80	8.45	32.03	104.40	20.24	1.53	0.63
1978	0.25	0.23	0.19									
1980	0.75	0.30	0.25	0.19	1.59	10.26	22.43	63.66	30.83	5.62	0.84	0.44
1981	0.36	0.34	0.25	0.30	5.33	6.24	24.99	100.71	123.19	9.39	1.69	0.79
1982	0.67	0.57	0.54	0.60	1.78	7.97	19.53	68.64	79.33	15.43	1.69	0.65
1983	0.52	0.46	0.42	0.32	0.31	5.01	14.20	48.51	54.31	7.23	0.76	0.50
1984	0.42	0.37	0.33	0.32	3.45	10.82	24.61	58.90	47.55	47.86	2.31	0.63
1985	0.48	0.41	1.28	1.32	5.42	7.56	52.02	190.39	94.78	15.43	0.89	0.61
1986	0.46	0.39	0.38	0.19	2.11	9.29	32.30	126.24	213.72	32.57	8.02	4.66
1990	1.61	1.15	1.57	1.30	4.96	11.71	83.84	85.35	128.77	13.32	4.06	2.84
1991	2.28	2.00	1.78	1.49	24.96	52.65	49.01	98.18	110.92	26.43	4.43	2.70
1992	2.11	1.81	1.48	3.91	21.39	11.10	30.36	90.36	174.63	19.74	5.16	2.76
1993	2.13	1.77	1.69	1.79	11.19	18.39	81.98	146.90	155.32	13.88	5.60	2.24
1994	2.03	1.86	1.71	1.62	7.80	34.18	27.28	104.52	103.79	100.48	9.83	3.30
1995	2.97	2.25	2.01	3.00	5.48	15.92	43.70	68.20	129.80	22.85	4.41	2.66
1996	2.05	2.04	1.84	1.58	1.84	20.61	63.92	118.99	142.74	47.48	6.96	3.58
1997	2.40	1.79	2.05	3.13	8.41	30.01	38.14	117.65	183.86	40.56	8.36	3.53
1998	2.72	2.00	1.74	3.37	5.69	26.75	53.63	193.50	167.20	86.50	10.44	4.89
1999	3.41	2.64	2.20	1.90	4.08	19.62	110.02	134.04	132.27	41.06	6.07	3.28
2000	2.43	2.16	1.80	2.16	16.64	112.86	81.88	90.59	149.16	22.43	3.56	1.97
2001	0.77	0.37	0.21	0.67	128.33	74.04	33.85	70.63	254.33	13.00	0.78	0.17
2002	0.04	0.00	1.13	1.15	8.70	8.62	29.33	93.67	70.95	43.51	5.66	4.60
2003	1.94	1.17	0.38	0.45	0.86	7.60	43.78	226.27	236.73	18.17	2.72	1.11
2004	0.40	0.18	0.06	0.84	6.19	20.20	83.97	116.62	122.87	33.03	5.83	0.96
2005	0.63	0.53	0.08	0.17	3.72	4.34	25.97	73.78	37.07	23.58	1.64	0.08

5.3 Site 3: Masaka

This site is also located on the Tubo River some 15 km downstream of Yula Buruku site. The site is draining a catchment of 5866 km^2. For the peak discharge

at different return periods, it is assumed – as a first trial - equal to the peak discharge at the Miles 20 Lagos Road Station (Table 5.5). These values are checked against the results of hydrologic simulations using the SCS method. The hydrologic simulation shows that due to flat slopes of the river reaches, the effect of hydrologic routing through the river tends to flatten the hydrograph. As for the monthly discharge, it is calculated as the runoff of the previously mentioned station multiplied by the catchment area (Table 5.6).

Table 5.5: Peak discharge for spillway design for Masaka site (m^3/s)

Return Period	Discharge at station site	SCS based Discharge	Design Discharge
10000	1470	4000	4000
1000	1180	2700	2700
100	882	1633	1633
50	792	1333	1333
25	702	1083	1083
20	672	1020	1020
10	580	788	788
5	483	582	582

Table 5.6: Monthly discharge for Masaka site (m^3/s)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1960						0.00	31.54	71.62	141.44	92.86	11.09	1.53
1961		0.00		0.00	0.00	13.58	49.50	73.37	138.96	43.36		
1962				0.23	0.66	10.18	0.00	135.35	236.72	104.69	20.37	7.01
1963	3.07	1.68	1.10	2.04	3.94	9.28	27.16	88.70	158.42	104.03	19.69	6.13
1964	3.07	1.68	1.10	0.91	2.41	8.37	34.82	173.68	243.74	45.99	13.58	6.57
1965	3.94	2.64	1.75	1.36	2.19	65.63	43.36	86.07	147.33	35.70	8.37	4.16
1966	2.63	1.68	0.88	1.13	11.83	28.06	24.75	104.69	165.21	95.49	17.88	8.54
1967	5.04	5.05	1.10				42.49	97.02	128.55			4.16
1968	1.97	1.44	0.88	3.17	11.17	11.99	74.90	77.53	84.41	18.83	5.21	2.63
1969	1.75	0.96	0.88	1.58	17.52	6.11	40.08	86.07	108.18	32.41	20.37	0.00
1972				0.45	8.10	19.69	27.16	47.74	89.39	23.87		
1972		0.24	0.22	0.84	5.98	8.06	6.07	88.90	64.45	13.12	4.73	1.82
1973	1.05	0.14	0.09	0.75	1.45	3.37	8.80	47.92	61.40	16.91	2.04	1.53
1974	2.15	2.26	1.62	0.59	2.32	3.08	17.21	98.62	173.40	43.56	2.96	1.10
1975	0.94	0.72	0.50	1.18	8.67	5.95	32.57	57.78	183.13	30.11	4.73	1.99
1976	1.16	1.78	0.68	1.56	5.67	15.95	49.50	67.59	36.75	57.67	16.29	3.02
1977	1.45	0.77	0.18	0.32	0.31	8.17	8.85	33.55	109.35	21.20	1.61	0.66
1978	0.26	0.24	0.20									
1980	0.79	0.31	0.26	0.20	1.66	10.75	23.50	66.69	32.29	5.89	0.88	0.46
1981	0.37	0.36	0.26	0.32	5.58	6.54	26.17	105.50	129.04	9.83	1.77	0.83
1982	0.70	0.60	0.57	0.63	1.86	8.35	20.46	71.90	83.10	16.16	1.77	0.68
1983	0.55	0.48	0.44	0.34	0.33	5.25	14.87	50.81	56.89	7.58	0.79	0.53
1984	0.44	0.38	0.35	0.34	3.61	11.34	25.78	61.70	49.81	50.13	2.42	0.66
1985	0.50	0.43	1.34	1.38	5.67	7.92	54.49	199.43	99.28	16.16	0.93	0.64
1986	0.48	0.41	0.39	0.20	2.21	9.73	33.84	132.24	223.87	34.12	8.40	4.88
1990	1.69	1.20	1.64	1.36	5.19	12.27	87.82	89.40	134.88	13.95	4.25	2.98
1991	2.39	2.09	1.86	1.56	26.15	55.15	51.34	102.85	116.19	27.68	4.64	2.83
1992	2.21	1.90	1.55	4.10	22.40	11.63	31.80	94.66	182.93	20.67	5.41	2.89
1993	2.23	1.85	1.77	1.88	11.72	19.26	85.87	153.88	162.70	14.54	5.86	2.34
1994	2.12	1.95	1.80	1.70	8.17	35.80	28.58	109.48	108.72	105.26	10.30	3.46
1995	3.11	2.36	2.10	3.15	5.74	16.68	45.77	71.44	135.97	23.94	4.62	2.78
1996	2.15	2.14	1.93	1.65	1.93	21.59	66.95	124.64	149.52	49.74	7.29	3.75
1997	2.52	1.87	2.15	3.28	8.80	31.43	39.95	123.24	192.59	42.49	8.76	3.70
1998	2.85	2.09	1.82	3.53	5.96	28.02	56.18	202.70	175.14	90.60	10.93	5.12
1999	3.57	2.76	2.30	1.99	4.27	20.55	115.24	140.41	138.55	43.01	6.36	3.44
2000	2.54	2.26	1.88	2.26	17.43	118.23	85.76	94.90	156.25	23.50	3.73	2.06
2001	0.81	0.38	0.22	0.70	134.43	77.56	35.46	73.98	266.41	13.62	0.81	0.18
2002	0.04	0.00	1.18	1.20	9.11	9.03	30.73	98.12	74.32	45.58	5.93	4.82
2003	2.04	1.23	0.39	0.48	0.90	7.97	45.86	237.01	247.97	19.03	2.85	1.16
2004	0.42	0.19	0.07	0.88	6.48	21.16	87.95	122.16	128.70	34.60	6.11	1.01
2005	0.66	0.55	0.09	0.18	3.90	4.55	27.20	77.29	38.84	24.70	1.72	0.09

5.4 Site 4: Karami & Kaduna

This site is located downstream of the confluence between Karami and Kaduna Rivers, some 42 km east of Kaduna City. Based on the fact that very little peak

flow comes from the Ribako tributary, it is assumed that the peak discharge at different return periods at Karami and Kaduna dam site is equal to the peak discharge at Kaduna South station (Table 5.7) without any reduction. As for the monthly discharge, it is calculated as the total volume from the Kaduna South station minus the total volume from the Ribako station (Table 5.8). Whenever missing or erroneous data at any of the two stations occurred, the monthly average volume of the month of the missing data was used, corrected to conform to the water availability at the year of the missing data.

Table 5.7: Peak discharge for spillway design for Karami and Kaduna site (m^3/s)

Return Period	Design Discharge
10000	9460
1000	7470
100	5470
50	4870
25	4260
20	4060
10	3440
5	2790

Table 5.8: Monthly discharge for Karami and Kaduna site (m^3/s)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1960	5.50	3.02	1.38	29.85	28.88	88.83	284.41	470.16	430.68	105.66	30.43	7.84
1961	9.63	6.04	3.44	4.26	299.16	58.08	198.15	310.63	297.14	58.81	22.03	32.32
1962	4.81	3.77	4.13	12.53	26.06	81.23	215.26	372.50	1026.74	298.89	68.65	26.91
1963	14.31	7.10	4.23	19.66	41.48	91.52	179.48	486.01	236.79	378.05	72.99	3.17
1964	12.24	4.83	1.47	8.18	30.20	94.00	215.25	558.22	902.73	134.84	30.37	2.66
1965	1.44	0.82	0.53	1.93	11.31	97.62	154.41	306.83	319.36	48.49	9.12	2.79
1967	4.45	2.53	0.79	3.55	35.76	83.15	290.22	488.69	672.41	292.97	49.03	11.66
1968	6.64	4.36	4.48	15.50	57.13	259.62	351.48	756.24	450.96	126.60	27.33	8.63
1969	6.90	4.16	1.73	6.34	37.23	41.91	166.49	401.04	569.66	217.37	51.59	11.69
1972	5.86	3.34	2.13	5.16	30.30	91.47	190.49	702.92	435.20	153.74	34.82	10.32
1973	5.45	1.23	1.17	4.11	8.30	53.10	113.48	571.09	495.34	49.87	19.26	8.07
1974	4.10	1.31	4.58	7.47	64.23	66.90	160.55	426.12	1080.35	239.23	32.54	4.32
1975	5.55	2.63	0.38	12.76	77.53	81.36	295.99	569.18	788.49	172.85	43.75	10.23
1976	9.37	3.19	2.04	7.71	34.96	88.71	247.07	349.46	400.47	288.90	83.32	18.38
1977	14.64	8.50	1.71	2.58	24.04	113.26	147.16	277.02	361.25	134.72	11.02	5.19
1979	8.48	3.44	1.02	4.00	23.50	56.10	267.88	326.38	478.26	142.34	30.82	6.46
1980	1.48	1.87	3.06	2.55	53.45	127.11	290.10	430.75	362.88	113.54	27.86	7.87
1981	0.48	0.27	0.17	0.13	34.49	67.89	245.87	386.09	589.41	178.90	26.93	3.43
1982	0.68	0.39	0.25	2.07	14.74	49.73	238.06	413.73	376.18	158.46	21.41	4.96
1983	1.27	0.78	1.15	4.20	15.81	97.75	170.57	330.56	328.63	55.33	6.18	1.35
1984	0.07	0.04	0.99	12.18	21.86	75.79	125.27	185.64	207.60	107.34	8.10	1.47
1985	0.79	0.45	1.09	2.99	15.07	106.09	214.73	373.24	318.58	94.74	4.57	1.40
1986	0.20	0.11	1.78	1.50	31.50	55.02	2.41	325.68	486.45	321.40	14.78	3.05
1991	0.99	0.84	1.81	3.58	84.97	46.34	213.10	733.51	293.92	50.37	13.04	4.20
1992	0.99	0.53	1.73	6.42	9.85	95.39	287.80	391.75	895.38	48.94	10.69	8.83
1994	0.20	0.42	1.17	4.29	21.88	79.38	104.01	489.58	890.11	202.29	25.37	10.00
1995	1.12	0.64	0.41	1.49	16.25	55.37	103.20	345.19	355.76	52.31	9.84	3.01
1996	0.34	0.19	0.12	0.45	26.92	86.12	253.90	356.79	450.96	74.86	0.30	0.09
1997	0.00	0.00	0.00	4.92	34.38	124.10	186.09	524.98	524.34	107.44	15.32	4.69

5.5 Site 5: Itisi

This site is located on the Kaduna River, some 50 km east of Kaduna City. Based on the fact that very little peak flow comes from the Ribako tributary as well as from the Karami tributary, it is assumed that the peak discharge at different return periods at Itisi dam site is equal to the peak discharge at Kaduna South station (Table 5.9) with a 15% reduction. As for the monthly discharge,(Table 5.10) it is calculated as the monthly runoff estimated at Karami and Kaduna site multiplied by the catchment are drained by Itisi dam site, which is 5882 km^2. This is based on the fact that the total runoff at Kauru station (on the Karami tributary) is similar to the total runoff on the Kaduna River at Kaduna South station. However, as previously mentioned, most of the peak discharge is generated from the Kaduna tributary.

Table 5.9: Peak discharge for spillway design for Itisi site (m^3/s)

Return Period	Design Discharge
10000	8227
1000	6496
100	4757
50	4235
25	3705
20	3531
10	2992
5	2427

Table 5.10: Monthly discharge for Itisi site (m^3/s)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1960	3.22	1.77	0.80	17.46	16.89	51.95	166.34	274.98	251.89	61.80	17.80	4.59
1961	5.63	3.53	2.01	2.49	174.97	33.97	115.89	181.67	173.79	34.40	12.88	18.90
1962	2.82	2.21	2.41	7.33	15.24	47.51	125.90	217.86	600.51	174.81	40.15	15.74
1963	8.37	4.15	2.47	11.50	24.26	53.53	104.97	284.25	138.49	221.11	42.69	1.85
1964	7.16	2.83	0.86	4.79	17.66	54.98	125.89	326.49	527.98	78.86	17.76	1.56
1965	0.84	0.48	0.31	1.13	6.62	57.10	90.31	179.45	186.78	28.36	5.33	1.63
1967	2.60	1.48	0.46	2.08	20.92	48.63	169.74	285.82	393.27	171.35	28.68	6.82
1968	3.89	2.55	2.62	9.06	33.41	151.84	205.57	442.30	263.75	74.04	15.99	5.05
1969	4.03	2.43	1.01	3.71	21.78	24.51	97.37	234.56	333.17	127.13	30.17	6.84
1972	3.42	1.95	1.25	3.02	17.72	53.50	111.41	411.11	254.54	89.92	20.37	6.03
1973	3.19	0.72	0.69	2.40	4.86	31.05	66.37	334.01	289.71	29.17	11.26	4.72
1974	2.40	0.77	2.68	4.37	37.56	39.13	93.90	249.22	631.86	139.92	19.03	2.52
1975	3.25	1.54	0.22	7.46	45.34	47.58	173.11	332.89	461.16	101.10	25.59	5.99
1976	5.48	1.86	1.19	4.51	20.45	51.89	144.50	204.38	234.22	168.97	48.73	10.75
1977	8.56	4.97	1.00	1.51	14.06	66.24	86.07	162.02	211.28	78.79	6.44	3.04
1979	4.96	2.01	0.60	2.34	13.74	32.81	156.67	190.89	279.72	83.25	18.02	3.78
1980	0.86	1.09	1.79	1.49	31.26	74.34	169.67	251.93	212.24	66.40	16.30	4.60
1981	0.28	0.16	0.10	0.07	20.17	39.71	143.80	225.81	344.73	104.63	15.75	2.00
1982	0.40	0.23	0.15	1.21	8.62	29.08	139.23	241.97	220.02	92.68	12.52	2.90
1983	0.74	0.46	0.67	2.46	9.25	57.17	99.76	193.33	192.21	32.36	3.61	0.79
1984	0.04	0.02	0.58	7.13	12.78	44.33	73.27	108.58	121.42	62.78	4.74	0.86
1985	0.46	0.26	0.64	1.75	8.81	62.05	125.59	218.30	186.33	55.41	2.67	0.82
1986	0.12	0.07	1.04	0.88	18.42	32.18	1.41	190.48	284.51	187.97	8.64	1.78
1991	0.58	0.49	1.06	2.09	49.69	27.10	124.64	429.00	171.90	29.46	7.63	2.45
1992	0.58	0.31	1.01	3.76	5.76	55.79	168.32	229.12	523.68	28.62	6.25	5.17
1994	0.12	0.24	0.69	2.51	12.80	46.42	60.83	286.34	520.60	118.31	14.84	5.85
1995	0.65	0.37	0.24	0.87	9.50	32.38	60.36	201.89	208.07	30.59	5.75	1.76
1996	0.20	0.11	0.07	0.26	15.75	50.37	148.50	208.68	263.75	43.79	0.17	0.05
1997	0.00	0.00	0.00	2.88	20.11	72.58	108.84	307.04	306.67	62.84	8.96	2.74

5.6 Site 6: Babbon Kogi

This site is located on the Babbon Kogi river, a tributary of Gurara river, about 100 km south east of Kaduna City. The site is draining a catchment of 1020 km^2. For the peak discharge at different return periods, it is assumed equal to the peak discharge at the Kachia Station (Table 5.11) multiplied by the ratio of (Area dam site / Area station site)^0.5. The exponent is adjusted based on hydrologic simulation on HEC-HMS software which is also used to confirm the results. This simulation is based on the SCS methodology previously described. A schematic of the simulation and output results are illustrated by Figure 5.2. As for the monthly discharge, it is calculated as the runoff of the previously mentioned station multiplied by the catchment area (Table 5.12).

Table 5.11: Peak discharge for spillway design for Babbon Kogi site (m^3/s)

Return Period	Discharge at station site	Discharge adjusted at dam site	SCS based simulation	Design Discharge (average of the 2 estimates)
10000	2310	3059	2597	2828
1000	1830	2423	2050	2236.5
100	1330	1761	1522	1641.5
50	1170	1549	1348	1448.5
25	1010	1338	1189	1263.5
20	959	1270	1146	1208
10	793	1050	978	1014
5	617	817	812	814.5

Table 5.12: Monthly discharge for Babbon Kogi site (m^3/s)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1970				0.83	7.05	20.19	29.25	77.08	25.62	13.60	3.94	1.41
1971	0.57	0.21	0.19	3.15	7.92	6.34	17.21	51.68	48.52	17.44	3.62	2.48
1972	0.46	0.33	0.11	0.12	10.89	20.19	48.52	88.39	54.19	17.44	4.64	2.55
1973	0.91	0.54	0.57	2.28	3.16	10.86	20.41	65.27	70.72	22.89	3.86	2.28
1974	0.91	0.50	0.30	2.48	14.05	9.76	40.56	55.52	82.72	16.53	5.04	2.67
1975	1.75	1.34	1.26	3.19	10.66	12.47	56.44	75.71	83.62	18.36	4.80	2.82
1976	1.29	0.59	0.11	0.91	8.61	16.09	28.79	36.71	36.28	29.48	8.85	3.85
1977	1.37	0.67	0.23									
1983	1.39	1.04	0.84	1.11	2.81	11.91	21.33	43.68	18.95	5.03	1.82	0.84
1984	0.23	0.20	0.21	0.44	1.45	6.75	6.78	14.00	14.74	7.15	1.56	1.04
1985	0.78	0.52	0.68	1.05	2.65	8.52	13.24	35.08	19.49	4.59	1.73	1.29
1986	0.83	0.73	0.59	2.33	5.37	9.50	25.10	35.52	27.50	15.39	3.93	1.66
1987	0.18	0.10	0.02	0.02	0.16	13.49	22.62	51.61	25.94	11.79	1.82	0.61
1989	0.07	0.03	0.02	0.12	4.07	11.99	14.88	56.40	25.83	14.58	1.28	0.46
1990	0.18	0.09	0.03	0.53	4.80	7.66	14.20	41.17	34.91	11.01	1.96	0.54
1992	0.38	0.04	0.21	0.44	2.07	7.45	21.65	50.50	51.11	11.02	1.43	0.42
1994	0.48	0.03	0.02	1.72	4.62	12.61	21.44	50.63	65.20	46.61	8.83	2.54
1995	1.47	0.71	1.81	6.25	2.86	12.01	20.22	57.21	19.68	15.32	7.44	1.28
1996	0.46	0.03	1.34	1.00	16.75	14.80	40.66	49.32	46.87	11.38	4.25	2.49
1997	1.50	0.53	0.86	4.17	6.73	14.74	17.46	57.08	86.49	18.32	15.49	3.59
1998	1.91	1.06	0.67	2.51	7.32	4.81	11.68	35.12	81.90	33.69	3.76	1.90
1999	0.87	0.41	0.67	1.82	13.79	44.79	163.16	93.43	42.12	41.32	6.04	5.32
2000	1.96	0.32	0.09	5.95	31.70	37.01	21.11	63.80	37.67	38.35	5.14	1.20
2001												
2002	30.01	4.71	0.19	1.11	0.06	5.67	76.38	156.25	80.93	92.42	8.61	0.59
2003	0.03	0.02	0.02	0.38	1.04	2.14	4.25	158.62	153.03	30.56	2.46	0.47
2004	0.02	0.02	0.06	1.62	1.28	0.51	12.31	14.99	97.70	98.87	16.82	0.02
2005	0.02	0.02	0.02	0.94	0.19	1.43	17.73	57.82	46.71	13.79	0.22	0.02

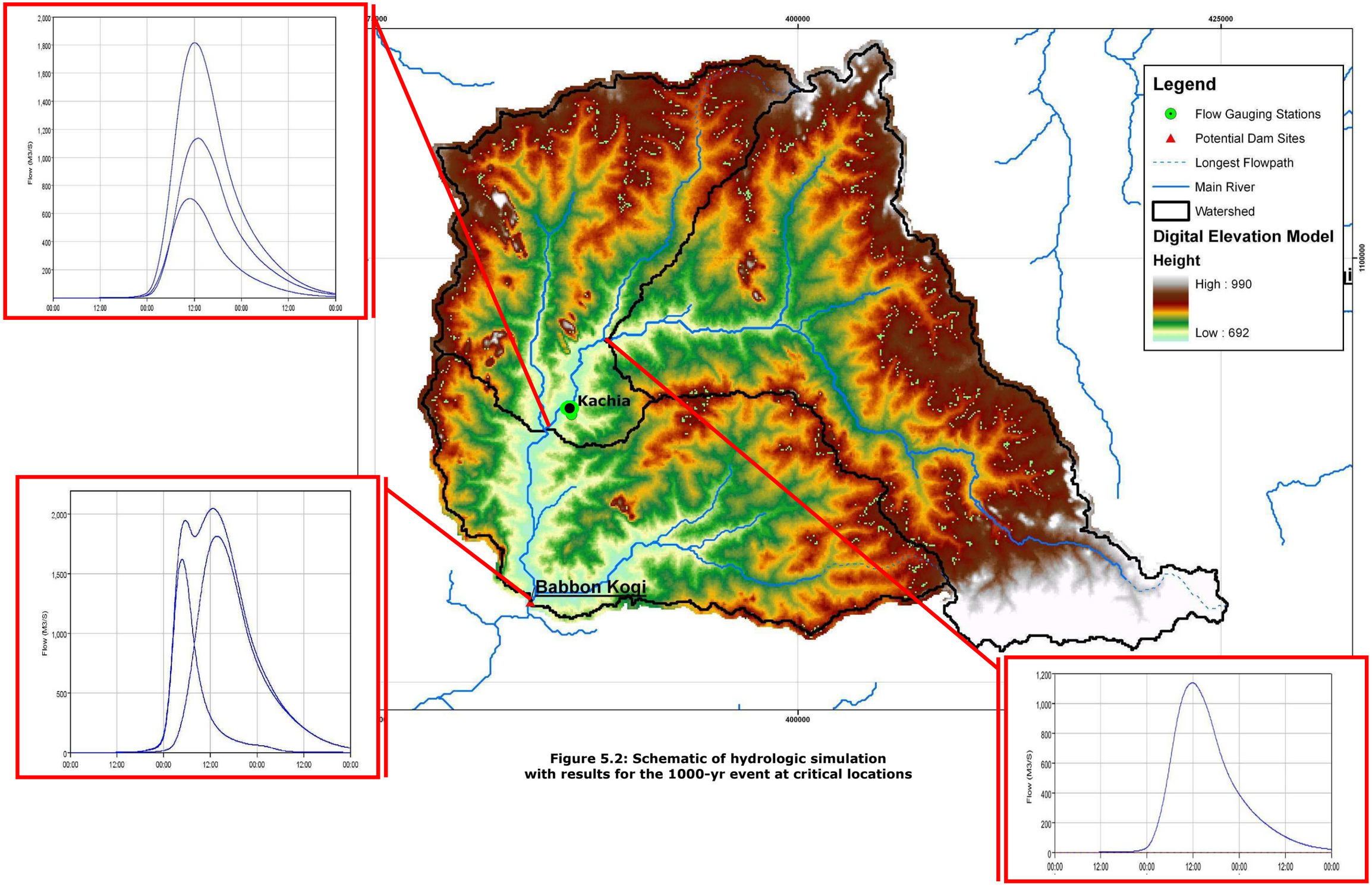


Figure 5.2: Schematic of hydrologic simulation with results for the 1000-yr event at critical locations

5.7 Site 7: Bakin Kogi

This site is located on the upper reach of Kaduna River, about 120 km south east of Kaduna City. The site is draining a catchment of 1685 km^2. For the peak discharge at different return periods, it is assumed equal to the peak discharge at the Bakin Kogi Station (Table 5.13) multiplied by the ratio of (Area dam site / Area station site)^0.5. The exponent is adjusted based on hydrologic simulation on HEC-HMS software which is also used to confirm the results. This simulation is based on the SCS methodology previously described. A schematic of the simulation and output results are illustrated by Figure 5.3. As for the monthly discharge, it is calculated as the runoff of the Itisi station (since it I the one having a longer record compared to the Bakin Kogi station) multiplied by the catchment area (Table 5.14).

Table 5.13: Peak discharge for spillway design for Bakin Kogi site (m^3/s)

Return Period	Discharge at station site	Discharge adjusted at dam site	SCS based simulation	Design Discharge (average of the 2 estimates)
10000	6010	6885	6141	6513
1000	4750	5442	4829	5135.5
100	3450	3953	3564	3758.5
50	3040	3483	3148	3315.5
25	2630	3013	2769	2891
20	2460	2819	2667	2743
10	2010	2303	2267	2285
5	1540	1765	1871	1818

Table 5.14: Monthly discharge for Bakin Kogi site (m^3/s)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1960	0.92	0.51	0.23	5.00	4.84	14.88	47.65	78.77	72.16	17.70	5.10	1.31
1961	1.61	1.01	0.58	0.71	50.12	9.73	33.20	52.04	49.78	9.85	3.69	5.42
1962	0.81	0.63	0.69	2.10	4.37	13.61	36.07	62.41	172.03	50.08	11.50	4.51
1963	2.40	1.19	0.71	3.29	6.95	15.33	30.07	81.43	39.67	63.34	12.23	0.53
1964	2.05	0.81	0.25	1.37	5.06	15.75	36.06	93.53	151.25	22.59	5.09	0.45
1965	0.24	0.14	0.09	0.32	1.90	16.36	25.87	51.41	53.51	8.12	1.53	0.47
1967	0.74	0.42	0.13	0.60	5.99	13.93	48.62	81.88	112.66	49.09	8.22	1.95
1968	1.11	0.73	0.75	2.60	9.57	43.50	58.89	126.70	75.56	21.21	4.58	1.45
1969	1.16	0.70	0.29	1.06	6.24	7.02	27.89	67.19	95.44	36.42	8.64	1.96
1972	0.98	0.56	0.36	0.86	5.08	15.33	31.91	117.77	72.92	25.76	5.83	1.73
1973	0.91	0.21	0.20	0.69	1.39	8.90	19.01	95.68	82.99	8.36	3.23	1.35
1974	0.69	0.22	0.77	1.25	10.76	11.21	26.90	71.39	181.01	40.08	5.45	0.72
1975	0.93	0.44	0.06	2.14	12.99	13.63	49.59	95.36	132.11	28.96	7.33	1.71
1976	1.57	0.53	0.34	1.29	5.86	14.86	41.40	58.55	67.10	48.40	13.96	3.08
1977	2.45	1.42	0.29	0.43	4.03	18.98	24.66	46.41	60.53	22.57	1.85	0.87
1979	1.42	0.58	0.17	0.67	3.94	9.40	44.88	54.68	80.13	23.85	5.16	1.08
1980	0.25	0.31	0.51	0.43	8.95	21.30	48.61	72.17	60.80	19.02	4.67	1.32
1981	0.08	0.05	0.03	0.02	5.78	11.38	41.19	64.69	98.75	29.97	4.51	0.57
1982	0.11	0.07	0.04	0.35	2.47	8.33	39.89	69.32	63.03	26.55	3.59	0.83
1983	0.21	0.13	0.19	0.70	2.65	16.38	28.58	55.38	55.06	9.27	1.04	0.23
1984	0.01	0.01	0.17	2.04	3.66	12.70	20.99	31.10	34.78	17.99	1.36	0.25
1985	0.13	0.08	0.18	0.50	2.52	17.78	35.98	62.54	53.38	15.87	0.77	0.23
1986	0.03	0.02	0.30	0.25	5.28	9.22	0.40	54.57	81.50	53.85	2.48	0.51
1991	0.17	0.14	0.30	0.60	14.24	7.76	35.70	122.90	49.24	8.44	2.19	0.70
1992	0.17	0.09	0.29	1.08	1.65	15.98	48.22	65.64	150.02	8.20	1.79	1.48
1994	0.03	0.07	0.20	0.72	3.67	13.30	17.43	82.03	149.13	33.89	4.25	1.68
1995	0.19	0.11	0.07	0.25	2.72	9.28	17.29	57.83	59.61	8.76	1.65	0.50
1996	0.06	0.03	0.02	0.08	4.51	14.43	42.54	59.78	75.56	12.54	0.05	0.02
1997	0.00	0.00	0.00	0.82	5.76	20.79	31.18	87.96	87.85	18.00	2.57	0.79

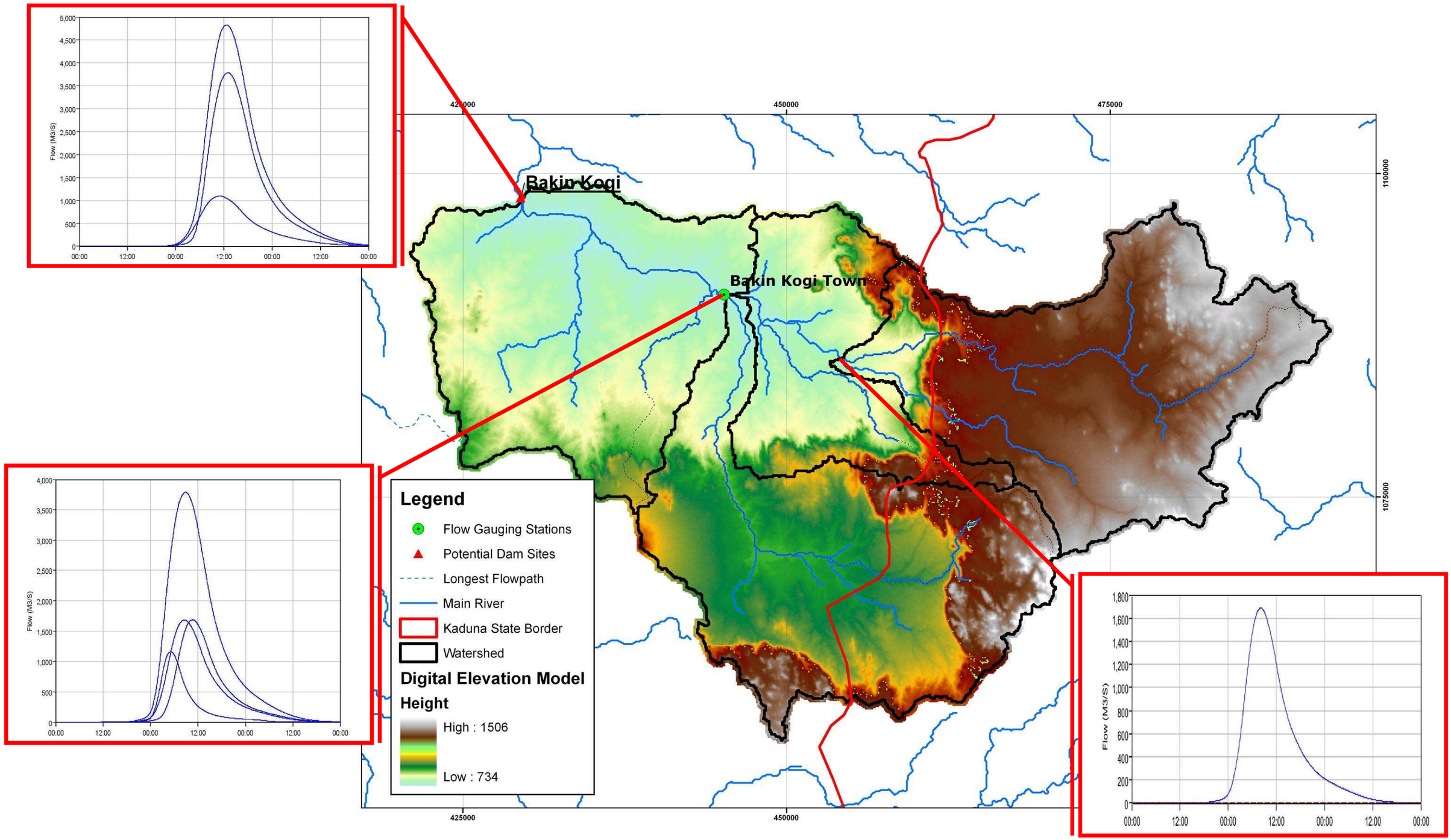


Figure 5.3: Schematic of hydrologic simulation Schematic of hydrologic simulation with results for the 1000-yr event at critical locations

5.8 Site 8: Galma 3

This site is located on the Likarbu River, a tributary of Galma River, about 30 km south of Zaria. The site is draining a catchment of 1036.3 km^2. For the peak discharge at different return periods, it is calculated by the SCS method (Table 5.15 and Figure 5.3). As for the monthly discharge, it is calculated as the runoff of the Ribako station multiplied by the catchment area (Table 5.16).

Table 5.15: Peak discharge for spillway design for Galma3 site (m^3/s)

Return Period	SCS based simulation
10000	2916
1000	2259
100	1632
50	1427
25	1243
20	1193
10	999
5	810

Table 5.16: Monthly discharge for Galma3 site (m^3/s)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1960						0.00	5.57	12.65	24.99	16.40	1.96	0.27
1961		0.00		0.00	0.00	2.40	8.74	12.96	24.55	7.66		
1962				0.04	0.12	1.80	0.00	23.91	41.82	18.49	3.60	1.24
1963	0.54	0.30	0.19	0.36	0.70	1.64	4.80	15.67	27.99	18.38	3.48	1.08
1964	0.54	0.30	0.19	0.16	0.43	1.48	6.15	30.68	43.06	8.13	2.40	1.16
1965	0.70	0.47	0.31	0.24	0.39	11.59	7.66	15.21	26.03	6.31	1.48	0.74
1966	0.46	0.30	0.15	0.20	2.09	4.96	4.37	18.49	29.19	16.87	3.16	1.51
1967	0.89	0.89	0.19				7.51	17.14	22.71			0.74
1968	0.35	0.25	0.15	0.56	1.97	2.12	13.23	13.70	14.91	3.33	0.92	0.46
1969	0.31	0.17	0.15	0.28	3.10	1.08	7.08	15.21	19.11	5.73	3.60	0.00
1970												
1971												
1972				0.08	1.43	3.48	4.80	8.43	15.79	4.22		
1973	0.01	0.04	0.03	0.02	0.10	1.32	5.21	20.70	24.34	11.41	0.42	0.03
1974	0.00	0.03	0.03	0.05	0.90	0.52	7.56	15.99	24.64	9.08	1.10	1.12
1975	0.10	0.06	0.05	0.33	2.22	1.67	8.51	19.12	34.42	9.03	1.56	0.43
1976	0.14	0.09	0.06	0.23	0.64	2.82	7.48	13.96	11.36	12.61	4.71	0.86
1977	0.18	0.08	0.05	0.04	0.32	1.90	2.50	7.73	21.19	5.43	0.70	0.15
1979	0.17	0.05	0.05	0.04	11.00	3.35	15.17	38.10	33.72	9.28	2.33	0.48
1980	0.09	0.06	0.06	0.04	1.18	2.92	6.79	16.85	13.29	2.81	0.73	0.16
1981	0.45	0.34	0.28	0.30	1.97	3.99	7.87	17.26	31.84	4.89	1.52	0.84
1982	0.42	0.45	0.39	0.44	0.68	1.40	3.63	11.62	8.90	3.40	1.17	0.50
1983	0.22	0.11	0.03	0.38	0.42	2.20	2.60	8.27	10.08	1.73	0.57	0.21
1984	0.49	0.35	0.27	0.20	1.80	1.12	3.63	4.91	3.33	3.12	0.60	0.19
1985	0.09	0.03	0.04	0.52	0.95	4.06	11.03	21.71	13.76	20.05	0.82	0.44
1986	0.26	0.12	0.04	0.20	0.44	0.82	4.74	20.17	8.13	1.84	1.21	0.68
1987	0.24	0.18	0.21	0.16	0.14	2.97	2.80	13.95	11.83	2.84	0.17	0.21
1991	0.27	0.22	0.14	0.21	2.24	10.86	6.89	17.87	11.89	4.46	0.82	0.41
1992	0.27	0.15	0.05	0.10	0.91	1.38	4.02	12.86	26.40	6.86	1.50	0.43
1993	0.13	0.17	0.17	0.15	0.87	3.14	12.09	26.69	24.66	9.95	3.93	0.49
1994	0.14	0.05	0.03	0.09	0.12	0.46	4.98	19.19	28.49	11.77	2.19	0.78
1995	0.26	0.10	0.03	0.02	0.04	0.66	4.16	20.86	24.17	6.35	1.54	0.44
1996	0.04	0.00	0.00	0.01	0.09	2.03	10.93	23.27	30.21	18.57	1.25	0.51
1997	0.29	0.23	0.17	0.22	0.42	1.98	4.32	12.16	26.20	12.80	8.02	4.43

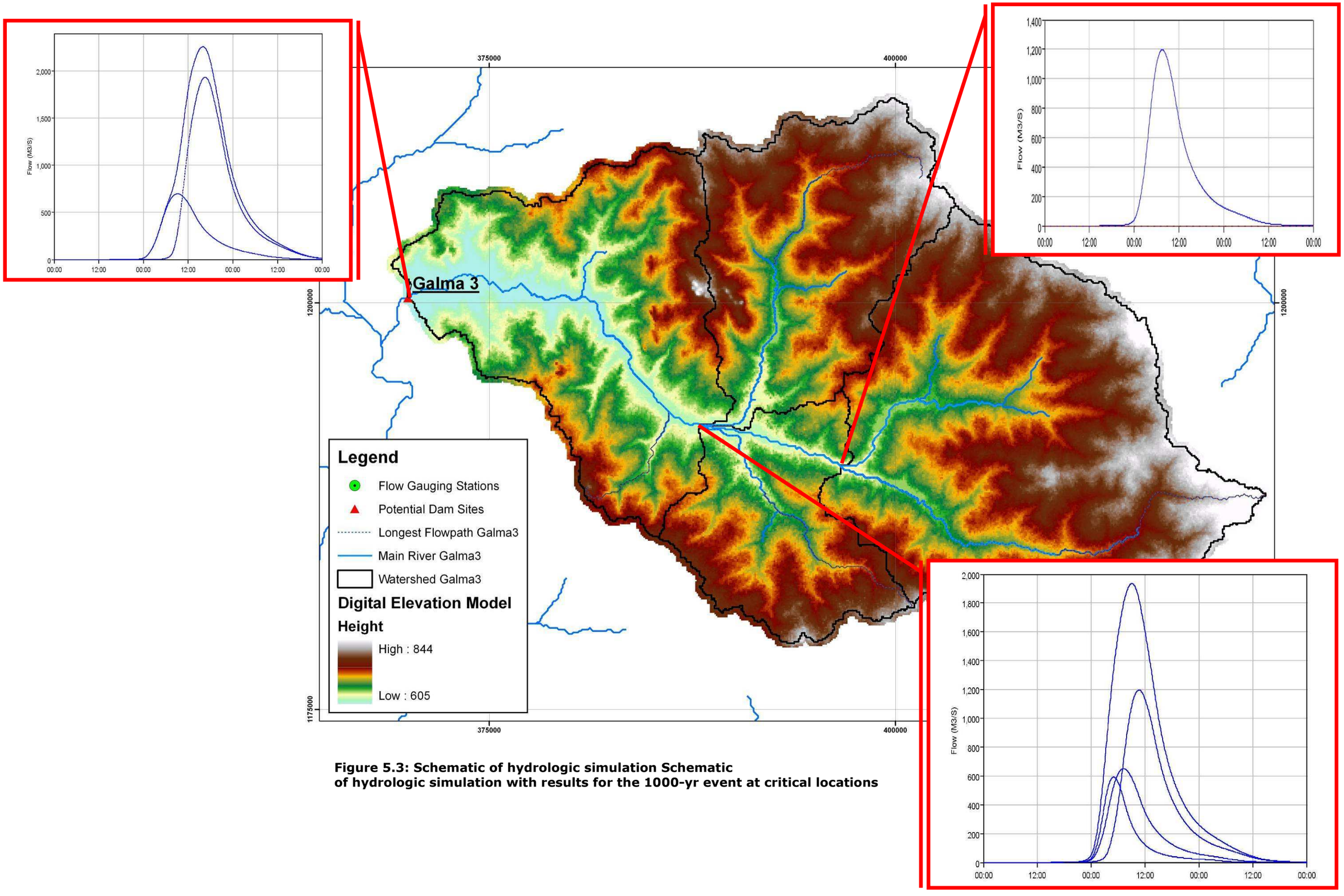


Figure 5.3: Schematic of hydrologic simulation Schematic of hydrologic simulation with results for the 1000-yr event at critical locations

SECTION 6: SEDIMENT ANALYSIS AT POTENTIAL DAM SITES

6.1 Introduction

The growing demand on water and food all over the world can be satisfied in arid regions only by artificial reservoirs, which could supply water for drinking, irrigation and power generation. Unfortunately, all the reservoirs are endangered by sedimentation and without effective measures their sustainability is compromised. Beside the loss of live storage, also the proper functioning of outlet structures such as intakes and bottom outlets can be affected by deposited sediments.

In the case of Nigeria, earth loss seems to be a major problem for the impounded reservoirs. This is due for the most cases to long and extreme precipitations that provoke the formation of gullies where soil is easily eroded in significant quantities and short time and pulverent soil is washed away and transported through rivers to the reservoir locations. In their reports, both JICA and Parkman reported this problem: *"Soil erosion represents a widespread problem of localized sites of severe erosion and gully formation, reducing soil productivity and agriculture return, polluting watercourses, and threatening buildings, infrastructure, and lives."*

Moreover, in an effort to quantify this phenomenon, they accounted: *"Disasters caused in Nigeria, under the above described conditions, are extremely serious with amounts of washed-out soils estimated at 1000 to 3000 tons/sq.km per annum in the Central and South Regions and at about 2000 tons/sq.km per annum in the North Regions."*

6.2 General Approach

Bathymetric surveys represent in general the best way to evaluate reservoir sedimentation. Therefore the Consultants developed two approaches to estimate the annual transport of solid materials (sediment yield) to the proposed dams' reservoirs:

- Use of empirical models based on the characteristics of the dams basins;
- Use of available estimates of sediments rate in reservoirs in the project area and in Nigeria with adjustments based on regional regression

relationships to account for differences in catchment area, underlying geology and runoff.

The second approach is regarded as being both more practical and more reliable than methods based on catchment modeling. Modeling the complex processes of erosion, sediment transport, and deposition through fluvial systems that are characterized by short high discharge runoff events requires prohibitively large quantities of site specific data, and extensive calibration, if it is to provide realistic results.

Finally predictions of future sediment yields cannot have a high degree of precision, irrespective of the method used to derive them. Yields are characterized by a high degree of variability, and long periods of record are needed if reliable estimates of mean values are to be obtained. It cannot be assumed that climatic and catchment conditions remained the same over periods in the past when base line data was collected, or that they will stay the same over the future period for which sediment yields are to be predicted. Recognizing this uncertainty, the results presented in this chapter consist of an estimate for the long-term siltation rates for the proposed dams' reservoirs, with an indication of the range of possible variations.

6.3 Available Sediments data on Nigerian dams

The FAO maintains a "World River Sediment Yields Database" (http://www.fao.org/ag/agl/aglw/ sediment/default.asp). Collected data on Nigerian dams are presented as follows:

Table 6.1: FAO Nigerian River Sediment Yields Database

River	Location	Watershed	Monitoring	Monitoring	Rainfall (mm/y)	Runoff (mm/y)	Sedim. yield
		Area (km²)	started	ended			(t/km²/y)
Watari		1450					483
Sokoto	Gusau	2653	1962	1965	1024	134	257
Zamfara	Anka	4126	1962	1965		147	344
Sokoto	Bakolori	4344	1965		966	151	426
Bunsuru		5900					438
Gagare	Kaura Namoda	6172	1962	1965	909	83	225
Bunsuru	Zurmi	6826	1962	1965	742	60	161
Sokoto	Sokoto	12851	1962	1965		60	212
Zamfara	Kalgo	16678	1962	1965		85	38
Rima	Sabon Birni	19832	1962	1965		48	100
Rima	Rima Bridge	21590	1963	1965			16
Rima	Argungu	43490	1964	1965		38	7
Niger	Baro	1,113,227			1000	172	5
Niger		1,200,000				160	33

Sediment discharge records collected at 6 sites to the north of Kaduna State in the period 1963 to 1977 were analyzed for the Water Supply Master Plan for Kaduna State Water Board in 1979. A regression equation (MRT) was derived to express average sediment concentration from a catchment in terms of mean annual catchment rainfall in mm (MAP):

[1] $$\text{Sediment concentration (g/l)} = 1 + e^{(-0.0124 \times MAP + 11.81)}$$

In the more recent Master Plan of 1997, the Consultant Parkman has conducted a survey of three reservoirs, namely Kangimi, Ikara and Jaji to give a quantitative assessment of rates of sedimentation. The Bagoma dam reservoir has been surveyed by same Consultants in 1989 and in 1995. The surveys' results as well as MRT equation results are presented in the following table:

Table 6.2: Survey Kaduna Dams Reservoirs

Site	Catchment area (km²)	Rainfall (mm)	Runoff MCM/y	SURVEY RESULTS		MRT results for sediment yields		
				MCM/y	t/km²/y	concentration g/l	MCM/y	t/km²/y
Kangimi	350	1200	57.8	-	-	1.046	0.043	173
Ikara	110	963	10	0.049	624	1.877	0.013	171
Jaji	35.5	1180	5.7	0.02	789	1.059	0.004	170
Bagoma	594	1223	108.7	0.036	85	1.035	0.080	189

* Kangimi level sedimentation could not be determined.

** Sediment volume mass ratio is considered 1.4 t/m^3

Zaria dam reservoir was surveyed in 2002 (KSWB, SAB Consultant for Parkman Consulting Engineers, 2002). The reservoir capacity at spillway crest level was found in 2002 to be 10.577MCM. However, the original reservoir capacity could not be retrieved and hence the sedimentation rate could not be determined.

Finally, recent studies have been accomplished for Galma and Gurara dams, but details of sedimentation analysis are not available. Since the number of years for the design of the dead storage is not known, the Consultants cannot use this data.

Dam	Basin (km²)	Dead storage (MCM)
Galma	1176	52
Gurara	2150	180

6.4 Sediments Yield for the Proposed Dams

6.4.1 Fournier Method

In the years 1960's, Fournier carried out experiments over several land parcels and established an empirical relationship that describes soil degradation and erosion due to precipitations.

[2] $\log D.S = 2.65\log(p^2/P) + 0.46 \log(H^2/S) - 1.56$

Where:

p: Precipitation corresponding to the month with the highest precipitation rate in mm

P: Annual precipitation in mm

S: Watershed surface in km²

H: Difference between the average watershed level and its lowest point in m

D.S: Soil loss in t/km²/year

Applying Fournier equation on the selected dams provides the results presented in Table 6.3.

Table 6.3: Fournier Empirical Equation Results

	Area (km²)	p²/P	H (m)	DS (t/km²/y)
Babbon Kogi	1,020	69	74	4,366
Bakin Kogi	1,686	79	249	15,420
Galma 3	1,037	58	60	2,292
Itisi	5,882	58	236	3,724
Karami & Kaduna	10,056	58	211	2,547
Masaka	5,866	56	87	1,304
New Yola Buruku	5,587	56	78	1,219
Upper Tubo	2,950	57	70	1,528
Yola / Buruku	5,621	56	81	1,251

6.4.2 MRT equation

Applying MRT equation [1] from Parkman (1997) on the selected dams provides the results shown in Table 6.4.

Table 6.4: MRT Equation Results

Site	Area (km²)	Rainfall (mm)	Runoff (mm)	Sediment Concentration (g/l)	MRT Sediment yield (t/y/km²)
Babbon Kogi	1020	972	498	1.78	889
Bakin Kogi	1686	953	515	1.99	1,024
Galma 3	1037	687	157	27.91	4,382
Itisi	5882	754	391	12.68	4,958
Karami & Kaduna	10056	758	391	12.11	4,737
Masaka	5866	843	162	4.88	791
New Yola Buruku	5587	833	162	5.40	875
Upper Tubo	2950	801	162	7.57	1,226
Yola/Buruku	5621	836	162	5.24	849

6.4.3 CIEH Model

The Interafrican Comity of Hydraulics Studies (C.I.E.H) established an empirical relationship for the Soudano-sahelian zones of Africa based on experiments

carried out on several watersheds in Burkina Faso. The relationship gives the specific soil loss as a function of mean annual precipitation and watershed surface:

[3] $DS = 700 (p/500)^{-2.2} S^{0.1}$

Where:

p: Mean annual precipitation in mm

S: Watershed surface in km^2

DS: Soil loss rate in $m^3/km^2/year$

This model provides the results presented in Table 6.5.

Table 6.5: CIEH Equation Results

	Area (km^2)	Rainfall (mm)	CIEH ($t/km^2/y$)
Babbon Kogi	1,020	972	454
Bakin Kogi	1,686	953	498
Galma 3	1,036	687	976
Itisi	5,883	754	945
Karami & Kaduna	10,056	758	986
Masaka	5,866	843	740
New Yola Buruku	5,587	833	756
Upper Tubo	2,950	801	773
Yola / Buruku	5,621	836	750

6.4.4 Model of Probst and Suchet

Dennmak (1984), and Probst and Suchet, (1992), demonstrate that sediment yields are correlated with the underlying geology. Demmak developed a regression relationship using data from thirty Algerian catchments, where the sediment yield is proportional to the proportion of a catchment occupied by Marls. The Probst and Suchet, (1992) regression relationship was developed from a large data set collected for one hundred and thirty catchments in the Maghreb. Probst and Suchet relate sediment yields to a rock erodibility coefficient, Kr (Table 6.6). The relationship is:

[4] $Ln (Ts) = 4.79 +(0.054 KER)+(0.004R) -(0.00056A)$

(r= 0.7)

Where SDR: sediment yield $t/km^2/year$

KER: erodability as listed in Table 6.6;

R: annual runoff, mm

A: Catchment area km^2

Table 6.6: Erodibility coefficients adopted by Probst and Suchet

Lithology	Kr
Granite	1
Sandstone Limestone	4
Schist /micaschists	10
Shales, pelites, marly sandstones, marly limestones	27
Marls	50

Based on available geological maps at various scales (1 :250,000 ; 1 :500,000 ; 1 :1,000,000), the geological units have been classified and rated as above. The areas of each unit have been estimated and therefore the weighted Kr of each basin has been calculated.

Table 6.7: SDR based on Probst and Suchet

	Area (km^2)	Weighted Kr	Average annual runoff (mm)	Ts ($t/y/km^2$)
Babban Kogi	1020	2.80	498	580
Bakin Kogi	1686	2.17	515	413
Galma3	1037	2.89	157	147
Itisi	5882	2.36	391	24
Karami Kaduna	10056	2.08	391	2
Masaka	5866	2.87	162	10
New Yola Buruku	5587	4.04	162	13
Upper Tubo	2950	4.01	162	55
Yola Buruku	5621	4.04	162	12

6.4.5 Sediments correlation with catchment areas

Many researchers have demonstrated that there is a correlation between catchment areas and sediment yield, with yields in most cases tending to decline as catchment areas increase. This is attributed to sediment delivery effects, with catchment slopes decreasing, and opportunities for sediment deposition increasing, as catchment areas increase. The effect of area is

accounted for using a "sediment delivery ratio", the ratio between the sediment yield from a catchment to that measured, or more usually predicted, from a small area of land. Methods for estimating sediment delivery ratios from catchment characteristics are described in the literature, see for example Walling and Webb (1996). In the simplest the delivery ratio is assumed to be a function of catchment area only. A wide range of values for k and n are reported for different catchments. As sediment delivery ratios are very dependent on the size range of the sediments that are being transported it is important to use local data when the impact of catchment area on sediment yields is being considered. Kassoul et al (1997) gives values for "n" ranging from 1 to – 0.43 depending on a catchment classification based on catchment area, runoff coefficient and altitude.

$$[\ 5\ ] \quad SDR = k\ Area^{-n}$$

Where SDR: Sediment Delivery ratio

Area: Catchment Area, km^2

n and k are constants

Based on the database of Nigerian dams (FAO), the SDR power relationship was found to be:

$$[\ 6\ ] \quad SDR = 36668\ A^{-0.615}$$

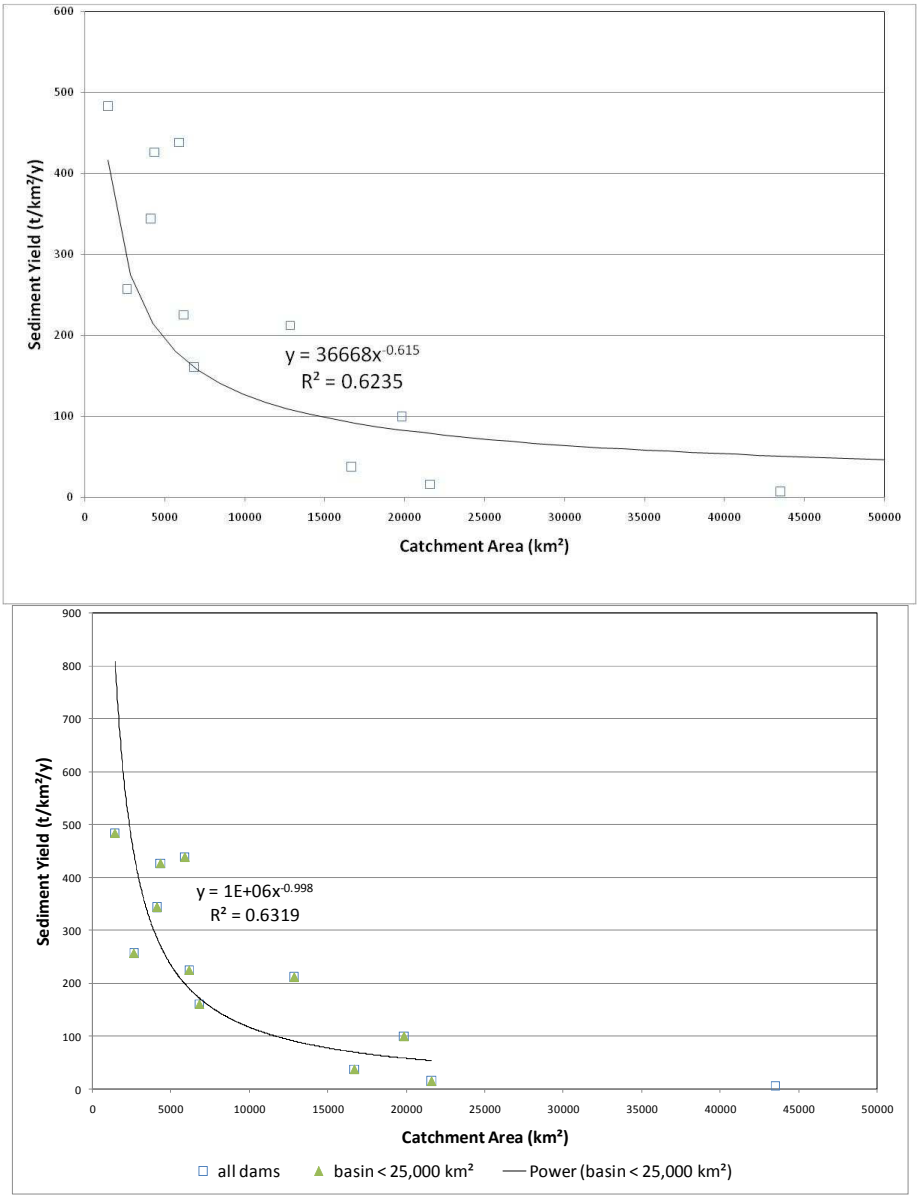


Figure 6.1: Sediment Yield vs. Catchment Area of Nigerian Dams

There does not seem to be a clear relationship between sediment yield and the runoff as shown in Figure 6.2 below.

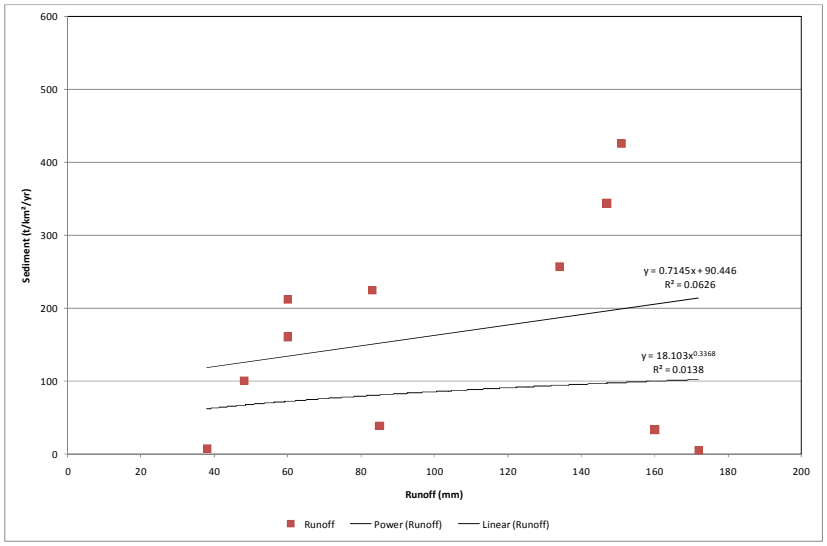


Figure 6.2: Sediment Yield vs. Runoff for Nigerian Dams

The application of equation [5] on the proposed sites dams are as shown in Table 6.8.

Table 6.8: Sediment yield based on Nigerian Dams – equation [5]

Watershed	Area (km²)	Sediment yield based on Nigerian Dams – equation [5] (t/km²/yr)
Babbon Kogi	1,020	518
Bakin Kogi	1,686	380
Galma3	1,036	513
Itisi	5,883	176
Karami	10,056	127
Masaka	5,866	177
New Yola Buruku	5,587	182
Upper Tubo	2,950	269
Yola/Buruku	5,621	181

6.4.6 Comparison with Bathymetric Surveys

If we apply the above equation established for all Nigerian dams ([5]) on Kaduna dams reservoirs that were surveyed (Table 6.2) the sediment yield is found to be much higher than the sediment yield deduced from the bathymetric surveys. The equation [5] is established for dams of catchments areas larger than 1000 km² and therefore cannot be applied to small catchments. Inversely the results of the bathymetric results cannot be extrapolated to the catchments of the proposed dams in this study.

Table 6.9: Equation [5] Results on Small Catchment Areas of Existing Dams

Watershed	Area (km²)	Sediment yield based on equation [5] (t/km²/yr)	Sediment yield based on the bathymetric survey (t/km²/yr)
Kangimi	350	3,030	--
Ikara	110	9,528	624
Jaji	35.5	29,193	789
Bagoma	594	1,795	85

6.4.7 Comparison of all Results and Discussion

Fournier equation is mainly associated to the climatic conditions and does not take into consideration the soil and rock resistance to erosion. Moreover, it seems overestimating the sediment yield because it does not take into account the spatial variability of the topography in the basin, i.e. there are local depressions or flood plains that will receive sediments and moderate its flow towards the selected reservoir locations.

MRT equation is mainly associated to the climatic conditions and the hydrological regime. Its results seem conservative for small catchments (smaller than 2000 km²). However for large dams they seem to overestimate the sediment yield.

CIEH model is also associated to climatic conditions. Moreover it takes into account the surface of the watershed. Unlike all other methods, it decreases with rainfall. When developed, it was intended to be used in arid countries like Burkina Faso and therefore it is not universal. It does not apply to Nigeria.

Probst & Suchet Model is one of the most comprehensive models since it takes into account the geological and hydrological factors, as well as the catchment area. However its application is limited to small to medium basin sizes.

Finally, as already mentioned above, the comparison with Nigerian dams is the most reliable method. However since the available data is mainly for larger catchment areas larger than 2000 km², the results of that method are adopted for the sites which catchment areas are larger than 2000 km².

Table 6.10: Final Results

Site name	Area km²	Fournier DS t/km²/yr	MRT Sediment yield t/km²/yr	CIEH t/km²/yr	Probst et Suchet Ts t/yr/km²	Sediment yield based on Nigerian Dams – equation t/km²/yr	Sediment yield t/yr
Babbon Kogi	1,020	4,366	889	454	580	**518**	**527,957**
Bakin Kogi	1,686	15,420	1,024	498	413	**380**	**640,660**
Galma 3	1,036	2,292	4,382	976	147	**513**	**531,130**
Itisi	5,883	3,724	4,958	945	24	**176**	**1,036,532**
Karami & Kaduna	10,056	2,547	4,737	986	2	**127**	**1,274,151**
Masaka	5,866	1,304	791	740	10	**177**	**1,035,378**
New Yola Buruku	5,587	1,219	875	756	13	**182**	**1,016,134**
Upper Tubo	2,950	1,528	1,226	773	55	**269**	**794,637**
Yola / Buruku	5,621	1,251	849	750	12	**181**	**1,018,510**

Adopted sediment yields for this study are taken from the FAO Nigerian dams' database model. The results are coherent with JICA (1995) recommendations in the National Water Resources Master Plan, on the adoption of specific yields 150 – 200 $m^3/km^2/yr$[7] for catchments larger than 500 km² and 200 – 300 $m^3/km^2/yr$[8] for catchments smaller than 500 km².

Finally, the above rates are based on existing data and models. They depend on the future land use developments of the basins. It is recommended to adopt at early stages soil conservation measures in the catchment in order to reduce sediment yield.

[7] This is equivalent to 210 – 280 t/km²/yr considering a sediment volume mass ratio is considered 1.4 t/m^3
[8] This is equivalent to 280 – 420 t/km²/yr considering a sediment volume mass ratio is considered 1.4 t/m^3

REFERENCES

- Dennmak A. 1984. **Recherche d'une relation empirique entre apports solides spécifiques et paramètres physico-climatique des bassins: application au cas Algérien.** IAHS publication 144, 403-414. IAHS Press, Institute of Hydrology, Wallingford UK.
- EIER – CIEH. Comparé L.M. **Polycopiée de Barrage 1996**, Ecole d'Ingénieur Inter-Etats en Equipement Rural (EIER-CIEH) 2ème édition, Ouagadougou, 277p.
- JICA. Federal Ministry of Water Resources and Rural Development – Republic of Nigeria. 1995. **The Study on the National Water Resources Master Plan. Sector Report.** Volume 2. Part 1. Sanuy Consultants.
- Fournier. 1958. **Les facteurs de l'érosion du sol en zone tropicale. Conclusion sur la conservation du sol.** AISH, Publication 43, 88-96, 542 p.
- Fournier 1960. **Débit solide des cours d'eau. Essai d'estimation de la perte en terre subie par l'ensemble du globe terrestre.** AISH, Publication 53, 19-22, 528 p.
- Kaduna State. **Kaduna Water Supply Master Plan**. March 1979. MRT Consulting Engineers.
- Kaduna State Water Board. **State-Wide Water Resources Master Plan, Kaduna State. 1997.** Parkman International in association with Parkman Nigeria Limited.
- Kassoul M et al. 1997. **Caractérisation de la sédimentation des barrages en Algérie**. Revue des sciences de l 'eau, 3(1997)339-358.
- Probst, J L & Suchet, P. 1992. **Fluvial sediment transport and mechanical erosion in the Maghreb (North Africa)**. Hydrological Sciences 37,6,12/1992.
- Walling D & Webb BW. 1996. **Erosion and sediment yield: a global overview**. IAHS Publication 236, Erosion and Sediment yield: Global and Regional Perspectives. IAHS Press, Institute of Hydrology Wallingford UK.

APPENDICES

Appendix A: Rainfall data

1- Kaduna Station

Year	Jan	Feb	Ma	Apr	Ma	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Tota
1954	0	0	25	80	14	23	18	26	30	89	8	0	133
1955	0	0	21	10	98	23	28	29	23	15	0	0	143
1956	0	2	69	12	29	14	13	20	37	53	2	7	103
1957	0	0	14	15	31	20	22	21	31	14	26	0	146
1958	0	0	0	10	89	15	19	19	33	40	3	0	110
1959	0	0	14	96	85	16	18	23	29	33	0	0	111
1960	0	0	0	21	10	23	20	37	36	35	4	0	153
1961	22	0	7	14	87	16	25	15	21	9	0	0	928
1962	0	0	1	86	16	15	23	35	39	16	34	0	159
1963	0	8	0	74	99	20	31	25	17	27	0	0	139
1964	0	0	6	43	86	14	26	19	29	32	0	0	106
1965	0	5	5	72	80	25	34	31	14	40	0	0	126
1966	0	0	0	18	22	23	12	27	44	67	0	0	154
1967	0	0	20	79	13	20	37	22	35	31	0	0	141
1968	0	0	12	98	13	21	31	29	25	28	0	0	134
1969	0	0	0	13	10	15	41	25	36	12	30	0	159
1970	0	0	13	0	18	12	25	33	24	18	0	0	116
1971	0	0	0	52	14	13	26	37	25	41	0	0	126
1972	0	0	8	41	23	13	22	44	16	10	0	0	134
1973	0	0	18	68	15	21	14	28	37	24	0	0	149
1974	0	0	0	72	11	19	16	28	31	68	0	0	119
1975	0	0	5	69	21	14	30	23	36	46	0	0	137
1976	0	0	0	10	93	19	11	22	17	33	0	0	124
1977	0	0	0	38	94	21	13	20	25	84	0	0	102
1978	0	0	27	25	17	23	25	19	30	14	0	0	159
1979	0	0	0	40	15	19	92	29	28	27	42	0	112
1980	0	0	0	4	21	16	23	29	17	13	0	0	122
1981	0	0	0	72	15	24	23	31	24	43	0	0	132
1982	0	0	6	10	64	10	31	40	12	72	0	0	119
1983	0	0	0	18	11	20	22	18	22	0	0	0	968
1984	0	0	21	32	81	17	14	24	26	69	0	0	102
1985	0	0	11	24	11	12	20	34	29	51	0	0	117
1986	0	0	0	67	53	12	23	27	33	19	1	0	110
1987	0	0	9	0	77	24	20	27	22	71	0	0	109
1988	0	4	0	50	12	10	23	48	33	25	0	0	136
1989	0	4	0	26	94	15	21	25	17	14	0	0	106
1990	0	0	1	41	24	16	26	33	76	71	0	0	119
1991	0	0	0	47	13	82	26	46	29	27	1	0	132
1992	0	0	29	2	20	17	37	25	15	78	0	0	126
1993	0	0	0	37	12	18	10	19	35	31	0	0	131

Total Monthly Rainfall in mm for Kaduna Station

2- Zaria Station

Year	Jan	Feb	Ma	Apr	Ma	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1954	0	9	23	135	173	117	170	433	295	23	43		1421
1955	0	0	20	37	93	185	326	243	262	85	0	0	1251
1956	0	0	24	50	19	189	199	176	201	43	0	0	901
1957	0	0	0	44	184	169	168	386	243	69	0	0	1263
1959	2	0	3	17	145	161	190	270	157	4	0	0	949
1960	0	0	0	93	49	154	199	233	373	9	0	0	1110
1961	0	0	5	50	87	214	272	126	250	0	0	0	1004
1962	0	0	4	41	28	204	217	305	351	67	42	0	1259
1963	0	2	1	42	116	195	163	292	287	139	0	0	1237
1965	0	3	0	53	44	306	182	254	179	19	0	0	1040
1966	0	0	4	106	140	172	377	309	276	81	0	0	1465
1967	0	0	2	23	32	138	267	109	303	1	0	0	875
1968	0	0	20	111	147	162	228	216	71	6	0	0	961
1969	0	0	0	74	86	194	192	283	89	6	0	0	924
1970	0	0	42	1	156	122	156	267	173	7	0	0	924
1972	0	0	0	0	67	34	100	425	192	9	0	0	827
1974	0	0	0	68	93	107	374	335	217	31	0	0	1225
1975	0	0	0	92	101	90	287	161	208	14	0	0	953
1976	0	0	0	60	47	17	154	219	115	155	0	0	767
1977	0	0	0	3	70	136	133	291	204	55	0	0	892
1978	0	0	3	53	98	263	263	325	237	40	0	0	1282
1979	0	0	7	77	122	220	208	311	131	33	13	0	1122
1980	0	0	0	6	178	137	230	244	81	107	0	0	983
1981	0	0	0	53	89	65	183	228	125	0	0	0	743
1982	0	0	7	21	53	135	158	81	104	52	0	0	611
1983	0	0	0	2	44	153	126	334	116	2	0	0	777
1984	0	0	8	27	148	101	164	174	200	47	0	0	869
1985	0	0	70	0	102	138	293	327	193	4	0	0	1127
1986	0	0	0	12	39	57	254	351	239	4	0	0	956
1987	0	0	0	0	24	170	216	308	96	37	0	0	851
1988	0	2	0	9	81	87	214	348	192	33	0	0	966
1989	0	0	0	24	91	120	197	165	100	65	0	0	762
1990	0	0	0	1	147	148	243	200	175	0	0	0	914
1991	0	0	3	134	323	65	236	226	96	16	0	0	1099
1992	0	0	0	55	146	70	244	215	210	10	2	0	952
1993	0	0	1	4	125	73	267	255	205	8	0	0	938
1994	0	0	0	32	53	121	141	290	147	153	0	0	937

Total Monthly Rainfall in mm for Zaria Station

3- Kauru Station

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1981	0	0	0	0	89	280	287	335	315	77	0	0	1383
1982	0	0	0	67	85	191	218	383	147	93	0	0	1184
1983	0	0	0	0	154	148	250	240	214	0	0	0	1006
1984	0	0	5	65	90	98	214	241	175	64	0	0	952
1985	0	0	22	0	177	310	320	228	266	1	0	0	1324
1986	0	0	5	24	110	109	210	206	225	43	0	0	932
1987	0	0	19	0	74	0	331	359	176	80	0	0	1039
1988	0	6	9	90	100	221	229	621	229	15	0	0	1520
1989	0	0	0	34	155	185	221	264	199	170	0	0	1228
1990	0	0	0	47	307	189	285	239	403	62	0	0	1532
1991	0	0	0	50	133	103	203	402	61	43	0	0	995
1992	0	0	35	119	80	181	173	223	143	30	11	0	995
1993	0	0	31	3	152	35	430	21	0	32	0	0	704
1994	0	0	0	39	44	53	59	515	42	24	0	0	776

Total Monthly Rainfall in mm for Kauru Station

4- Kafanchan Station

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1974	0	0	41	128	168	166	369	629	523	216	0	0	2239
1975	0	0	57	91	166	162	622	420	443	72	0	0	2031
1976	0	0	13	39	155	217	245	351	221	289	0	0	1529
1977	0	0	0	19	195	157	258	219	319	135	25	0	1327
1978	10	0	52	442	158	200	273	431	236	264	0	0	2065
1979	0	3	22	85	268	214	293	362	313	98	0	0	1659
1980	0	0	15	116	166	254	468	356	265	218	59	0	1917
1981	0	0	25	100	228	263	184	242	203	480	0	0	1725
1982	0	3	0	85	93	164	175	422	175	113	0	0	1230
1983	0	0	0	40	86	149	195	397	221	64	0	0	1151
1984	0	0	12	42	189	230	291	256	278	163	0	0	1461
1985	26	0	45	97	197	245	222	310	377	71	0	0	1589
1986	0	6	1	66	198	183	495	170	212	129	0	0	1460
1987	0	0	21	4	69	392	212	259	327	210	56	0	1549
1988	0	2	46	97	185	186	280	358	350	26	0	0	1530
1989	0	0	37	105	179	159	226	239	229	107	0	0	1281
1990	0	0	0	129	235	160	306	278	342	120	6	0	1576
1991	0	41	15	173	348	190	366	392	336	103	0	0	1963
1992	0	0	30	11	125	253	400	537	462	107	37	0	1962
1993	0	0	14	46	200	333	245	456	229	168	0	0	1692
1994	0	0	33	123	191	219	484	552	344	387	0	0	2333

Total Monthly Rainfall in mm for Kafanchan Station

5- Kachia Station

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1974	0	0	0	0	13	165	272	317	287	42	0	0	1096
1975	0	0	28	36	167	130	268	325	42	94	0	0	1090
1976	0	0	6	95	239	131	321	280	278	325	3	0	1678
1977	0	0	10	3	179	217	187	414	267	119	0	0	1396
1978	0	0	32	116	202	249	184	462	271	297	0	0	1813
1979	0	0	74	89	97	170	536	433	178	0	0	0	1577
1980	0	0	0	2	161	285	400	404	128	92	0	0	1472
1981	0	0	8	56	217	194	237	346	351	75	0	0	1484
1982	5	4	23	170	112	165	256	306	249	126	20	0	1436
1983	0	0	0	48	169	201	352	375	195	29	0	0	1369
1984	0	0	5	63	140	180	183	159	294	70	0	0	1094
1985	0	0	92	21	100	179	218	307	229	35	0	0	1181
1986	0	0	3	136	187	126	368	253	422	225	39	0	1759
1987	0	0	38	0	75	150	279	345	257	74	0	0	1218
1988	0	45	14	113	159	220	141	373	320	44	0	0	1429
1989	0	0	6	61	225	187	177	397	243	127	0	0	1423
1990	0	0	0	112	138	138	223	310	318	110	0	0	1349
1991	0	0	17	117	369	235	331	273	89	77	0	0	1508
1992	0	0	51	40	147	172	207	385	256	65	25	0	1348

Total Monthly Rainfall in mm for Kachia Station

Appendix B: Normality check of monthly rainfall

1- Kaduna South Station

Tests of Normality

	Kolmogorov-Smirnov(a)			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Jan	.538	40	.000	.147	40	.000
Feb	.508	40	.000	.394	40	.000
Mar	.258	40	.000	.676	40	.000
Apr	.132	40	.076	.866	40	.000
May	.121	40	.144	.940	40	.035
Jun	.090	40	.200(*)	.971	40	.396
Jul	.087	40	.200(*)	.979	40	.668
Aug	.118	40	.174	.946	40	.056
Sep	.110	40	.200(*)	.978	40	.613
Oct	.208	40	.000	.808	40	.000
Nov	.408	40	.000	.427	40	.000
Dec	.538	40	.000	.147	40	.000
Total	.079	40	.200(*)	.972	40	.412

* This is a lower bound of the true significance.
a Lilliefors Significance Correction

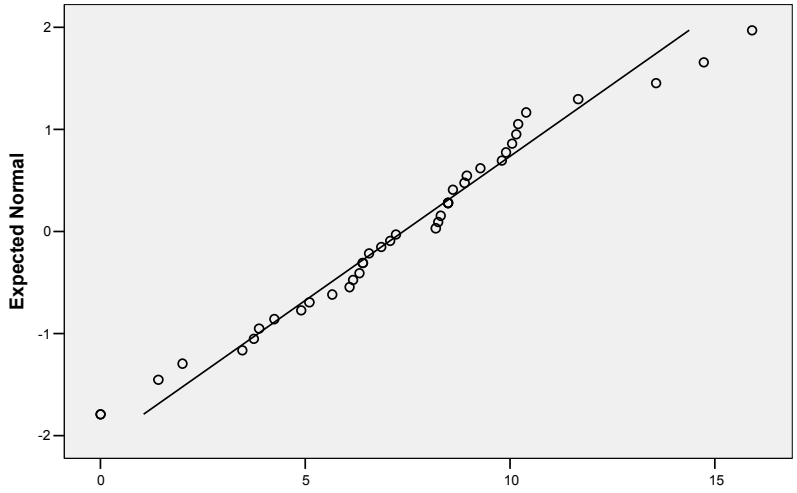
Months April, May and October need square root transformation.
No need to transform months January, February, March, November and December as the 80% available rainfall for these months is equal to zero.

Tests of Normality

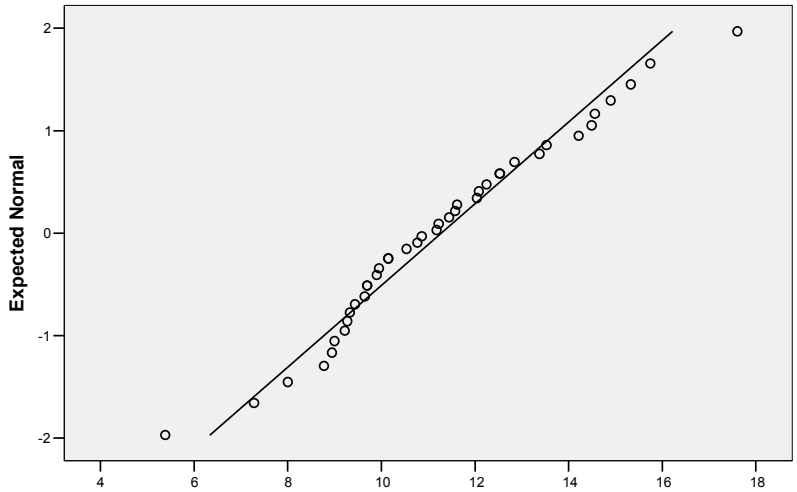
	Kolmogorov-Smirnov(a)			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
sqrt_April	.098	40	.200(*)	.977	40	.575
sqrt_May	.098	40	.200(*)	.980	40	.705
sqrt_Oct	.133	40	.073	.947	40	.058

* This is a lower bound of the true significance.
a Lilliefors Significance Correction

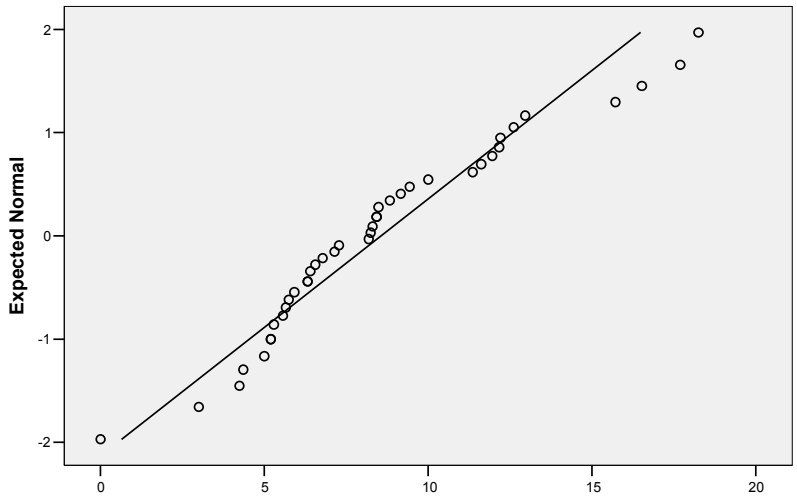
Normal Q-Q Plot of sqrt_April



Normal Q-Q Plot of sqrt_May



Normal Q-Q Plot of sqrt_Oct



2- Kauru Station

Tests of Normality(b,c)

	Kolmogorov-Smirnov(a)			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Feb	.534	14	.000	.297	14	.000
Mar	.268	14	.007	.754	14	.001
Apr	.185	14	.200(*)	.899	14	.109
May	.179	14	.200(*)	.843	14	.018
Jun	.134	14	.200(*)	.973	14	.915
Jul	.170	14	.200(*)	.946	14	.496
Aug	.183	14	.200(*)	.933	14	.340
Sep	.132	14	.200(*)	.975	14	.936
Oct	.155	14	.200(*)	.894	14	.091
Nov	.534	14	.000	.297	14	.000
Total	.183	14	.200(*)	.947	14	.515

* This is a lower bound of the true significance.
a Lilliefors Significance Correction
b Jan is constant. It has been omitted.
c Dec is constant. It has been omitted.

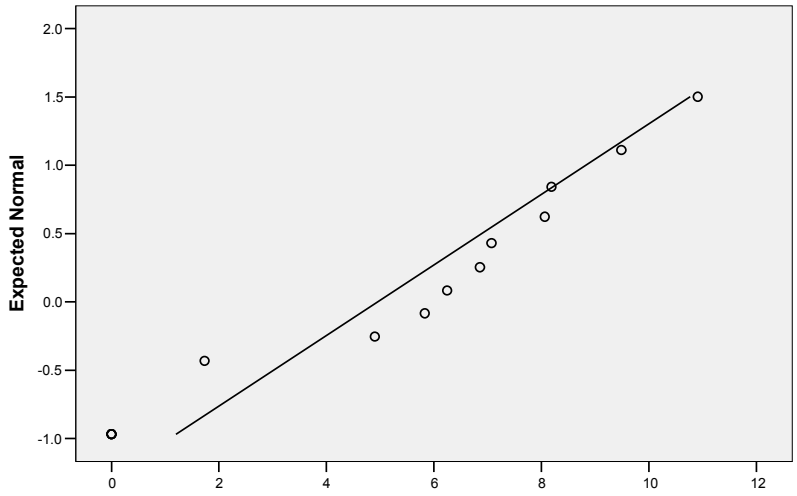
Months April and May need square root transformation.
No need to transform months January, February, March, November and December as the 80% available rainfall for these months is equal to zero.

Tests of Normality

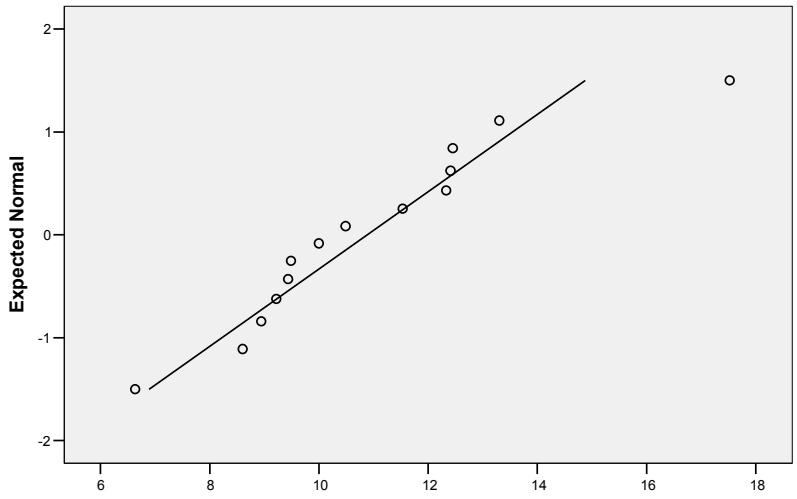
	Kolmogorov-Smirnov(a)			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
sqrt_April	.185	14	.200(*)	.887	14	.073
sqrt_May	.135	14	.200(*)	.927	14	.275

* This is a lower bound of the true significance.
a Lilliefors Significance Correction

Normal Q-Q Plot of sqrt_April



Normal Q-Q Plot of sqrt_May



3- Kachia Station

Tests of Normality(b)

	Kolmogorov-Smirnov(a)			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Jan	.538	19	.000	.244	19	.000
Feb	.493	19	.000	.275	19	.000
Mar	.207	19	.032	.796	19	.001
Apr	.124	19	.200(*)	.941	19	.274
May	.110	19	.200(*)	.944	19	.313
Jun	.115	19	.200(*)	.952	19	.424
Jul	.149	19	.200(*)	.915	19	.091
Aug	.107	19	.200(*)	.970	19	.776
Sep	.171	19	.146	.953	19	.447
Oct	.249	19	.003	.825	19	.003
Nov	.452	19	.000	.492	19	.000
Total	.128	19	.200(*)	.952	19	.424

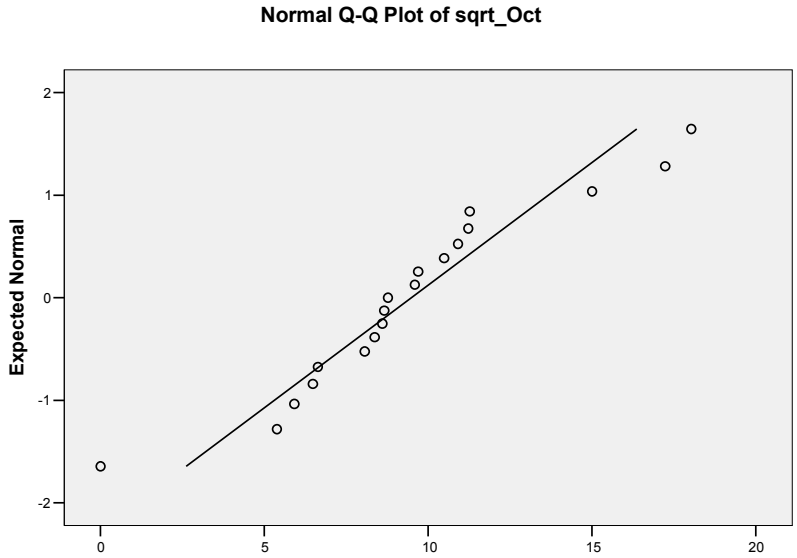
* This is a lower bound of the true significance.
a Lilliefors Significance Correction
b Dec is constant. It has been omitted.

Month of October needs square root transformation.
No need to transform months January, February, March, October, November and December as the 80% available rainfall for these months is equal to zero.

Tests of Normality

	Kolmogorov-Smirnov(a)			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
sqrt_Oct	.177	19	.118	.942	19	.287

a Lilliefors Significance Correction



4- Kafanchan Station

Tests of Normality(b)

	Kolmogorov-Smirnov(a)			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Jan	.518	21	.000	.329	21	.000
Feb	.388	21	.000	.325	21	.000
Mar	.141	21	.200(*)	.928	21	.127
Apr	.267	21	.000	.697	21	.000
May	.188	21	.051	.935	21	.170
Jun	.146	21	.200(*)	.855	21	.005
Jul	.196	21	.035	.894	21	.027
Aug	.099	21	.200(*)	.965	21	.632
Sep	.153	21	.200(*)	.931	21	.143
Oct	.189	21	.047	.871	21	.010
Nov	.441	21	.000	.531	21	.000
Total	.132	21	.200(*)	.962	21	.567

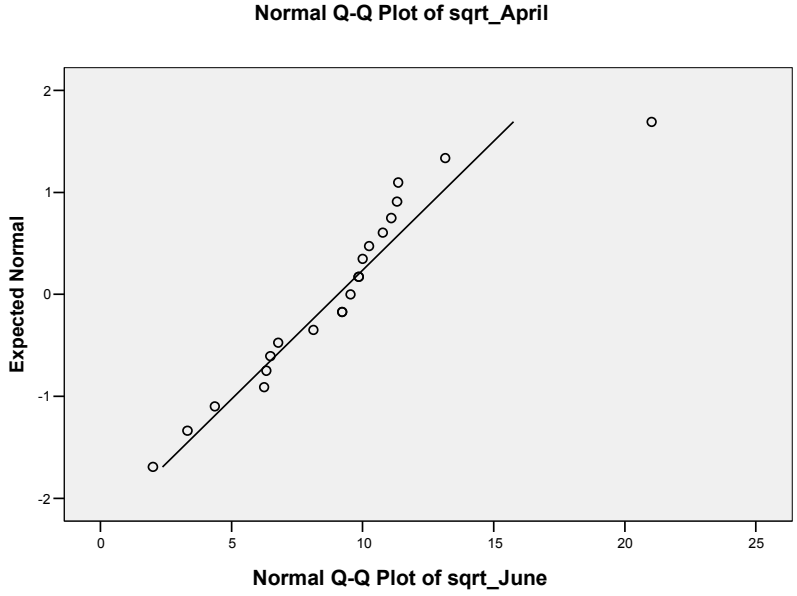
* This is a lower bound of the true significance.
a Lilliefors Significance Correction
b Dec is constant. It has been omitted.

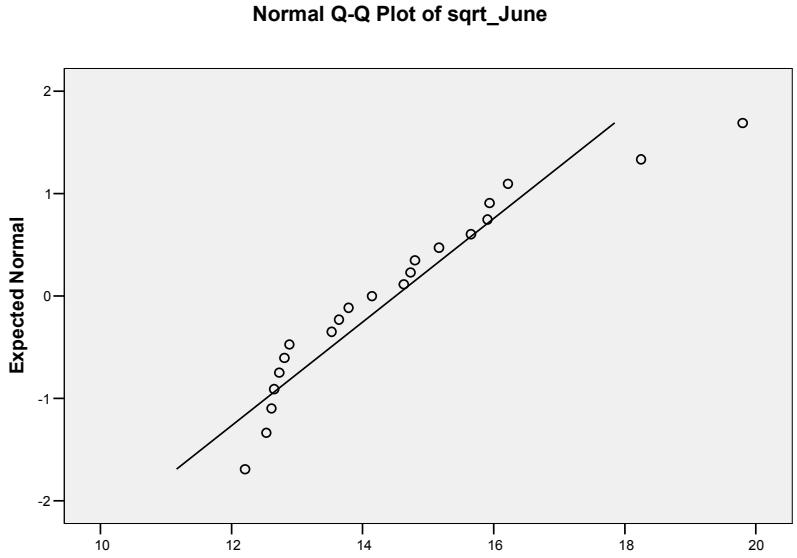
Months April, June, July and October need square root transformation.
No need to transform months January, February, November and December as the 80% available rainfall for these months is equal to zero.

Tests of Normality

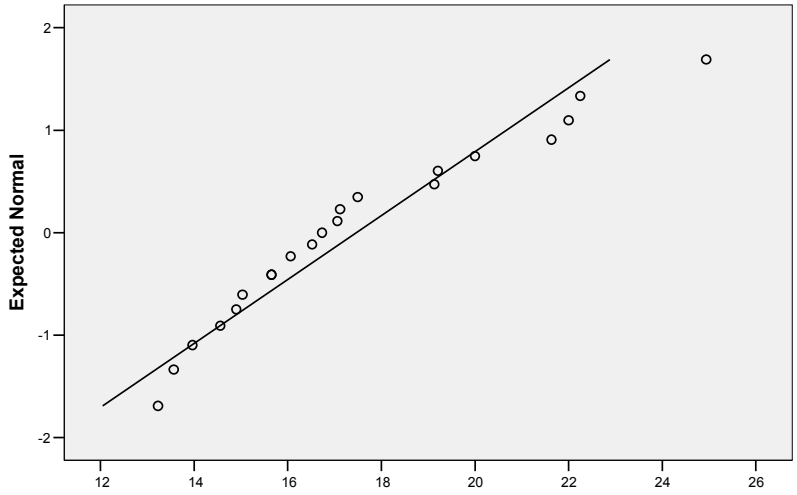
	Kolmogorov-Smirnov(a)			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
sqrt_April	.186	21	.057	.905	21	.045
sqrt_June	.127	21	.200(*)	.893	21	.026
sqrt_July	.163	21	.150	.931	21	.145
sqrt_Oct	.146	21	.200(*)	.958	21	.477

* This is a lower bound of the true significance.
a Lilliefors Significance Correction

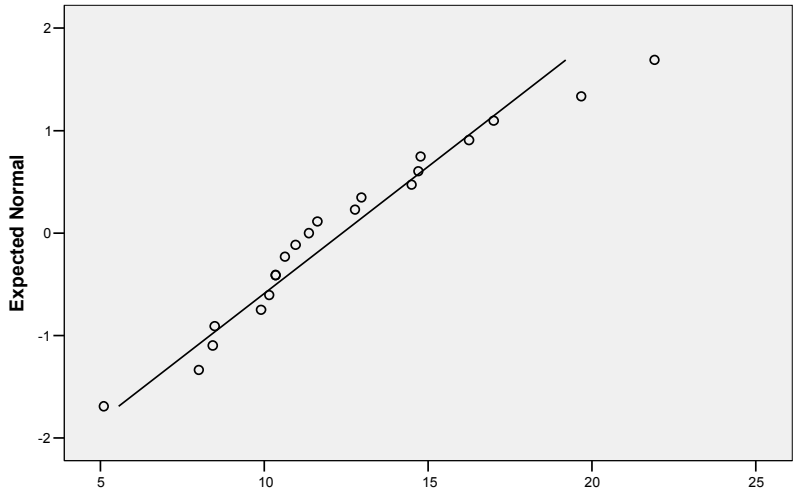




Normal Q-Q Plot of sqrt_July



Normal Q-Q Plot of sqrt_Oct



5- Zaria Station

Tests of Normality(b)

	Kolmogorov-Smirnov(a)			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Jan	.538	36	.000	.158	36	.000
Feb	.531	36	.000	.322	36	.000
Mar	.329	36	.000	.506	36	.000
Apr	.126	36	.157	.918	36	.011
May	.119	36	.200(*)	.888	36	.002
Jun	.073	36	.200(*)	.985	36	.891
Jul	.085	36	.200(*)	.964	36	.288
Aug	.078	36	.200(*)	.988	36	.955
Sep	.084	36	.200(*)	.962	36	.249
Oct	.186	36	.003	.816	36	.000
Nov	.503	36	.000	.232	36	.000
Total	.168	36	.012	.958	36	.183

* This is a lower bound of the true significance.
a Lilliefors Significance Correction
b dec is constant. It has been omitted.

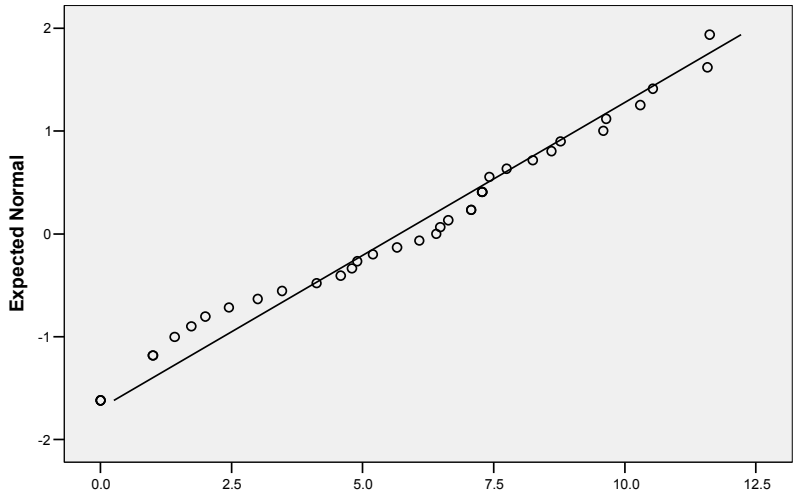
Months April, May and October need square root transformation.
No need to transform months January, February, March, November and December as the 80% available rainfall for these months is equal to zero.

Tests of Normality

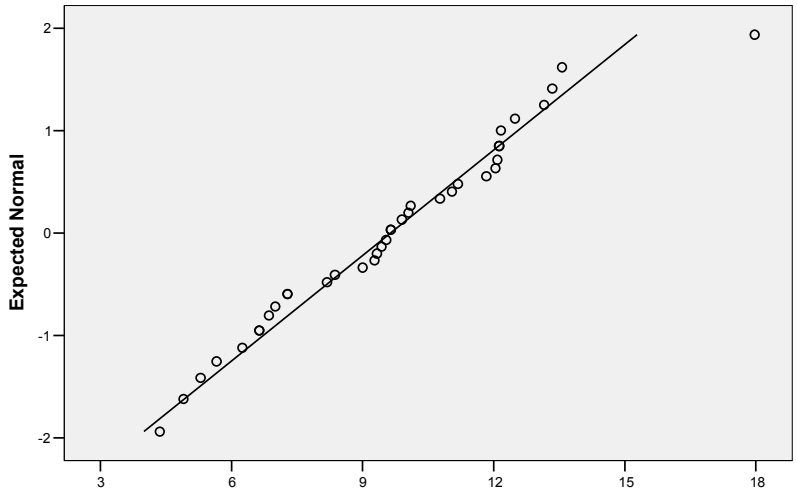
	Kolmogorov-Smirnov(a)			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
sqrt_April	.096	37	.200(*)	.961	37	.210
sqrt_May	.088	37	.200(*)	.969	37	.384
sqrt_Oct	.125	37	.151	.954	37	.133

* This is a lower bound of the true significance.
a Lilliefors Significance Correction

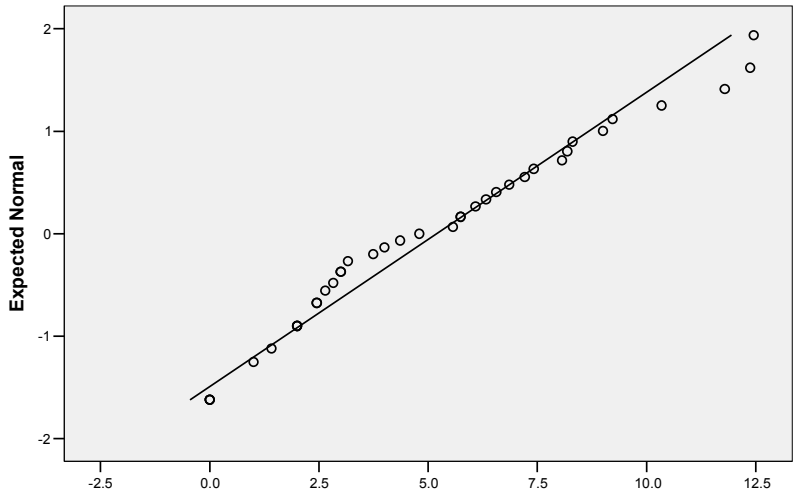
Normal Q-Q Plot of sqrt_April



Normal Q-Q Plot of sqrt_May



Normal Q-Q Plot of sqrt_Oct



Appendix C: Frequency analysis of maximum daily rainfall

1- Kaduna South Station

N07114 - Kaduna South Station

Results of the fitting

Gumbel (Method of moments)

Number of observations 13

Parameters

u	66.59775
alpha	13.41043

Quantiles
q = F(X) : non-exceedance probability
T = 1/(1-q)

T	q	XT	Standard deviation	Confidence interval (95%)	
10000	0.9999	190	36.5	119	262
2000	0.9995	169	30.3	109	228
1000	0.999	159	27.6	105	213
200	0.995	138	21.4	95.7	180
100	0.99	128	18.7	91.6	165
50	0.98	119	16.1	87.4	150
20	0.95	106	12.6	81.8	131
10	0.9	96.8	9.96	77.3	116
5	0.8	86.7	7.37	72.3	101
3	0.6667	78.7	5.56	67.8	89.6
2	0.5	71.5	4.38	62.9	80.1

2- Airport 1 Station

N07114 - Airport 1 Station

Results of the fitting

Gumbel (Method of moments)

Number of observations 21

Parameters
u 63.25647
alpha 13.73954

Quantiles
q = F(X) : non-exceedance probability
T = 1/(1-q)

T	q	XT	Standard deviation	Confidence interval (95%)	
10000	0.9999	190	29.4	132	247
2000	0.9995	168	24.4	120	215
1000	0.999	158	22.2	115	202
200	0.995	136	17.2	102	170
100	0.99	126	15.1	96.9	156
50	0.98	117	13	91.5	142
20	0.95	104	10.1	84.2	124
10	0.9	94.2	8.03	78.4	110
5	0.8	83.9	5.94	72.2	95.5
3	0.6667	75.7	4.48	66.9	84.5
2	0.5	68.3	3.53	61.4	75.2

3- Airport 2 Station

N07114 - Airport 2 Station

Results of the fitting

Gumbel (Method of moments)

Number of observations 22

Parameters
u 61.62985
alpha 18.02881

Quantiles
q = F(X) : non-exceedance probability
T = 1/(1-q)

T	q	XT	Standard deviation	Confidence interval (95%)	
10000	0.9999	228	37.7	154	302
2000	0.9995	199	31.3	137	260
1000	0.999	186	28.5	130	242
200	0.995	157	22.1	114	200
100	0.99	145	19.3	107	182
50	0.98	132	16.6	99.4	165
20	0.95	115	13	89.7	141
10	0.9	102	10.3	82	122
5	0.8	88.7	7.62	73.7	104
3	0.6667	77.9	5.75	66.6	89.2
2	0.5	68.2	4.52	59.4	77.1

4- Merged Airport 1 and Airport 2 Stations

N07114 - Merged Airport 1-2 Data

Results of the fitting

Gumbel (Method of moments)

Number of observations 43

Parameters
u 62.44909
alpha 15.891

Quantiles
q = F(X) : non-exceedance probability
T = 1/(1-q)

T	q	XT	Standard deviation	Confidence interval (95%)	
10000	0.9999	209	23.8	162	255
2000	0.9995	183	19.7	145	222
1000	0.999	172	18	137	207
200	0.995	147	13.9	119	174
100	0.99	136	12.2	112	159
50	0.98	124	10.5	104	145
20	0.95	110	8.2	93.6	126
10	0.9	98.2	6.49	85.5	111
5	0.8	86.3	4.8	76.9	95.7
3	0.6667	76.8	3.62	69.7	83.9
2	0.5	68.3	2.85	62.7	73.9

Appendix D: Frequency analysis of peak instantaneous discharge

1- Kaduna South Station

N08024 - Kaduna South Peak Discharge

Results of the fitting

Gumbel (Method of moments)

Number of observations 29

Parameters
u 1495.461
alpha 864.6525

Quantiles
q = F(X) : non-exceedance probability
T = 1/(1-q)

T	q	XT	Standard deviation	Confidence interval (95%)	
10000	0.9999	9460	1580	6370	1.25E+04
2000	0.9995	8070	1310	5510	1.06E+04
1000	0.999	7470	1190	5130	9800
200	0.995	6070	923	4270	7880
100	0.99	5470	808	3890	7060
50	0.98	4870	694	3510	6230
20	0.95	4060	543	3000	5130
10	0.9	3440	430	2600	4280
5	0.8	2790	318	2170	3420
3	0.6667	2280	240	1810	2750
2	0.5	1810	189	1440	2180

N08024 - Kaduna South Peak Discharge

Results of the fitting

Gamma (Method of moments)

Number of observations 29

Parameters
alpha 0.001622
lambda 3.234886

Quantiles
q = F(X) : non-exceedance probability
T = 1/(1-q)

T	q	XT	Standard deviation	Confidence interval (95%)	
10000	0.9999	8880	1720	5510	1.23E+04
2000	0.9995	7710	1410	4940	1.05E+04
1000	0.999	7200	1280	4680	9710
200	0.995	5970	976	4060	7880
100	0.99	5430	845	3770	7080
50	0.98	4870	715	3460	6270
20	0.95	4100	547	3030	5170
10	0.9	3480	423	2650	4310
5	0.8	2820	308	2220	3420
3	0.6667	2300	237	1830	2760
2	0.5	1790	194	1410	2170

N08024 - Kaduna South Peak Discharge

Results of the fitting

Pearson type 3 (Method of moments)

Number of observations 29

Parameters
alpha 0.001282
lambda 2.021989
m 417.6478

Quantiles
q = F(X) : non-exceedance probability
T = 1/(1-q)

T	q	XT	Standard deviation	Confidence interval (95%)	
10000	0.9999	9620	3730	N/D	N/D
2000	0.9995	8250	2850	N/D	N/D
1000	0.999	7650	2480	N/D	N/D
200	0.995	6250	1670	N/D	N/D
100	0.99	5630	1340	3000	8250
50	0.98	5000	1030	2980	7020
20	0.95	4140	667	2840	5450
10	0.9	3480	455	2590	4370
5	0.8	2780	333	2120	3430
3	0.6667	2240	295	1660	2820
2	0.5	1740	263	1230	2260

2- Ribako Station

N08024 - Ribako Peak Discharge

Results of the fitting

Gumbel (Method of moments)

Number of observations 21

Parameters
u 245.0663
alpha 79.15012

Quantiles
q = F(X) : non-exceedance probability
T = 1/(1-q)

T	q	XT	Standard deviation	Confidence interval (95%)	
10000	0.9999	974	169	642	1310
2000	0.9995	847	141	571	1.12E+03
1000	0.999	792	128	541	1040
200	0.995	664	99.3	470	859
100	0.99	609	86.9	439	780
50	0.98	554	74.6	408	700
20	0.95	480	58.4	366	595
10	0.9	423	46.2	333	514
5	0.8	364	34.2	297	431
3	0.6667	317	25.8	266	367
2	0.5	274	20.3	234	314

N08024 - Ribako Peak Discharge

Results of the fitting

Gamma (Method of moments)

Number of observations 21

Parameters
alpha 0.028215
lambda 8.203453

Quantiles
q = F(X) : non-exceedance probability
T = 1/(1-q)

T	q	XT	Standard deviation	Confidence interval (95%)	
10000	0.9999	826	130	571	1080
2000	0.9995	743	109	529	9.58E+02
1000	0.999	707	100	510	904
200	0.995	618	79.3	462	773
100	0.99	577	70.2	440	715
50	0.98	535	61	415	655
20	0.95	475	48.7	380	571
10	0.9	426	39.5	349	504
5	0.8	371	30.7	311	431
3	0.6667	325	25.1	276	374
2	0.5	279	21.6	237	321

N08024 - Ribako Peak Discharge

Results of the fitting

Pearson type 3 (Method of moments)

Number of observations 21

Parameters
alpha 0.023079
lambda 5.489048
m 52.91875

Quantiles
q = F(X) : non-exceedance probability
T = 1/(1-q)

T	q	XT	Standard deviation	Confidence interval (95%)	
10000	0.9999	862	261	N/D	N/D
2000	0.9995	770	204	N/D	N/D
1000	0.999	729	180	N/D	N/D
200	0.995	632	126	385	878
100	0.99	588	104	384	791
50	0.98	542	82.9	380	705
20	0.95	479	57.8	365	592
10	0.9	427	42.2	344	509
5	0.8	369	31.6	307	431
3	0.6667	323	27.5	269	376
2	0.5	276	25.5	227	326

3- Tubo Station

N08024 - Tubo Peak Discharge

Results of the fitting

Gumbel (Method of moments)

Number of observations 29

Parameters
u 290.3372
alpha 128.5733

Quantiles
q = F(X) : non-exceedance probability
T = 1/(1-q)

T	q	XT	Standard deviation	Confidence interval (95%)	
10000	0.9999	1470	234	1020	1930
2000	0.9995	1270	194	887	1.65E+03
1000	0.999	1180	177	831	1530
200	0.995	971	137	702	1240
100	0.99	882	120	646	1120
50	0.98	792	103	590	994
20	0.95	672	80.8	514	831
10	0.9	580	63.9	454	705
5	0.8	483	47.3	390	576
3	0.6667	406	35.7	336	476
2	0.5	337	28.1	282	393

N08024 - Tubo Peak Discharge

Results of the fitting

Gamma (Method of moments)

Number of observations 29

Parameters
alpha 0.013406
lambda 4.887294

Quantiles
q = F(X) : non-exceedance probability
T = 1/(1-q)

T	q	XT	Standard deviation	Confidence interval (95%)	
10000	0.9999	1310	216	888	1730
2000	0.9995	1160	179	806	1.51E+03
1000	0.999	1090	163	769	1410
200	0.995	926	127	678	1170
100	0.99	853	111	636	1070
50	0.98	777	94.9	591	963
20	0.95	671	74.2	526	817
10	0.9	585	58.8	470	701
5	0.8	491	44.2	405	578
3	0.6667	415	35.1	346	484
2	0.5	340	29.4	282	398

N08024 - Tubo Peak Discharge

Results of the fitting

Pearson type 3 (Method of moments)

Number of observations 29

Parameters

alpha	0.021659
lambda	12.75645
m	-224.414

Quantiles
q = F(X) : non-exceedance probability
T = 1/(1-q)

T	q	XT	Standard deviation	Confidence interval (95%)	
10000	0.9999	1180	282	629	1.74E+03
2000	0.9995	1060	223	625	1500
1000	0.999	1010	198	620	1390
200	0.995	875	141	598	1150
100	0.99	814	118	583	1050
50	0.98	750	96.1	562	939
20	0.95	659	69.6	523	796
10	0.9	583	52.9	480	687
5	0.8	497	41	417	577
3	0.6667	424	36	353	494
2	0.5	349	33.9	283	416

4- Kauru Station

N08024 - Kauru Peak Discharge

Results of the fitting

Gumbel (Method of moments)

Number of observations 13

Parameters
u 139.0851
alpha 69.40905

Quantiles
q = F(X) : non-exceedance probability
T = 1/(1-q)

T	q	XT	Standard deviation	Confidence interval (95%)	
10000	0.9999	778	189	408	1150
2000	0.9995	667	157	360	9.74E+02
1000	0.999	619	143	339	898
200	0.995	507	111	290	724
100	0.99	458	96.9	268	648
50	0.98	410	83.2	247	573
20	0.95	345	65.1	218	473
10	0.9	295	51.5	194	396
5	0.8	243	38.2	168	318
3	0.6667	202	28.8	145	258
2	0.5	165	22.7	120	209

N08024 - Kauru Peak Discharge

Results of the fitting

Gamma (Method of moments)

Number of observations 13

Parameters
alpha 0.022607
lambda 4.04994

Quantiles
q = F(X) : non-exceedance probability
T = 1/(1-q)

T	q	XT	Standard deviation	Confidence interval (95%)	
10000	0.9999	708	187	341	1080
2000	0.9995	620	155	317	9.24E+02
1000	0.999	582	141	306	858
200	0.995	489	108	277	702
100	0.99	448	94.4	263	633
50	0.98	405	80.4	247	563
20	0.95	346	62.3	224	468
10	0.9	298	48.8	203	394
5	0.8	247	36.2	176	318
3	0.6667	205	28.4	149	261
2	0.5	165	23.5	118	211

N08024 - Kauru Peak Discharge

Results of the fitting

Pearson type 3 (Method of moments)

Number of observations 13

Parameters

alpha	-0.13836
lambda	151.7049
m	1275.603

Quantiles
q = F(X) : non-exceedance probability
T = 1/(1-q)

T	q	XT	Standard deviation	Confidence interval (95%)	
10000	0.9999	480	159	N/D	N/D
2000	0.9995	449	126	N/D	N/D
1000	0.999	434	112	N/D	N/D
200	0.995	395	79.8	N/D	N/D
100	0.99	376	66.9	N/D	N/D
50	0.98	354	54.8	247	462
20	0.95	321	40.9	241	401
10	0.9	292	32.6	228	356
5	0.8	255	27.3	201	308
3	0.6667	220	25.8	169	270
2	0.5	182	26.6	129	234

5- Kachia Station

N08024 - Kachia Peak Discharge

Results of the fitting

Gumbel (Method of moments)

Number of observations 20

Parameters
u 290.6663
alpha 218.8614

Quantiles
q = F(X) : non-exceedance probability
T = 1/(1-q)

T	q	XT	Standard deviation	Confidence interval (95%)	
10000	0.9999	2310	480	1370	3250
2000	0.9995	1950	398	1170	2.73E+03
1000	0.999	1800	363	1090	2510
200	0.995	1450	281	898	2000
100	0.99	1300	246	815	1780
50	0.98	1140	211	730	1560
20	0.95	941	166	616	1270
10	0.9	783	131	526	1040
5	0.8	619	97	429	809
3	0.6667	488	73.2	345	632
2	0.5	371	57.6	258	484

N08024 - Kachia Peak Discharge

Results of the fitting

Gamma (Method of moments)

Number of observations 20

Parameters
alpha 0.005292
lambda 2.206876

Quantiles
q = F(X) : non-exceedance probability
T = 1/(1-q)

T	q	XT	Standard deviation	Confidence interval (95%)	
10000	0.9999	2310	629	1080	3540
2000	0.9995	1970	511	972	2.97E+03
1000	0.999	1830	460	924	2730
200	0.995	1480	344	805	2150
100	0.99	1330	295	749	1900
50	0.98	1170	246	688	1650
20	0.95	959	183	599	1320
10	0.9	793	138	522	1060
5	0.8	617	97	427	807
3	0.6667	482	72.6	340	624
2	0.5	356	58.1	242	470

N08024 - Kachia Peak Discharge

Results of the fitting

Pearson type 3 (Method of moments)

Number of observations 20

Parameters
alpha 0.003878
lambda 1.185229
m 111.4028

Quantiles
q = F(X) : non-exceedance probability
T = 1/(1-q)

T	q	XT	Standard deviation	Confidence interval (95%)	
10000	0.9999	2620	1520	N/D	N/D
2000	0.9995	2200	1150	N/D	N/D
1000	0.999	2010	992	N/D	N/D
200	0.995	1590	646	N/D	N/D
100	0.99	1400	507	N/D	N/D
50	0.98	1220	378	N/D	N/D
20	0.95	974	231	521	1430
10	0.9	786	151	489	1080
5	0.8	596	116	369	823
3	0.6667	458	105	252	664
2	0.5	337	87.6	165	508

6- Bakin Kogi Station

N08024 - Bakin Kogi Peak Discharge

Results of the fitting

Gumbel (Method of moments)

Number of observations 16

Parameters
u 755.1612
alpha 569.3735

Quantiles
q = F(X) : non-exceedance probability
T = 1/(1-q)

T	q	XT	Standard deviation	Confidence interval (95%)	
10000	0.9999	6000	1400	3260	8740
2000	0.9995	5080	1160	2810	7.35E+03
1000	0.999	4690	1060	2620	6760
200	0.995	3770	818	2170	5370
100	0.99	3370	716	1970	4780
50	0.98	2980	615	1770	4180
20	0.95	2450	481	1500	3390
10	0.9	2040	381	1290	2780
5	0.8	1610	282	1060	2160
3	0.6667	1270	213	852	1690
2	0.5	964	168	635	1290

N08024 - Bakin Kogi Peak Discharge

Results of the fitting

Gamma (Method of moments)

Number of observations 16

Parameters
alpha 0.002032
lambda 2.20275

Quantiles
q = F(X) : non-exceedance probability
T = 1/(1-q)

T	q	XT	Standard deviation	Confidence interval (95%)	
10000	0.9999	6010	1830	2420	9600
2000	0.9995	5130	1490	2220	8.05E+03
1000	0.999	4750	1340	2120	7380
200	0.995	3850	1000	1880	5810
100	0.99	3450	858	1770	5130
50	0.98	3040	716	1640	4450
20	0.95	2490	534	1450	3540
10	0.9	2060	402	1270	2850
5	0.8	1600	282	1050	2160
3	0.6667	1250	211	839	1670
2	0.5	925	169	593	1260

N08024 - Bakin Kogi Peak Discharge

Results of the fitting

Pearson type 3 (Method of moments)

Number of observations 16

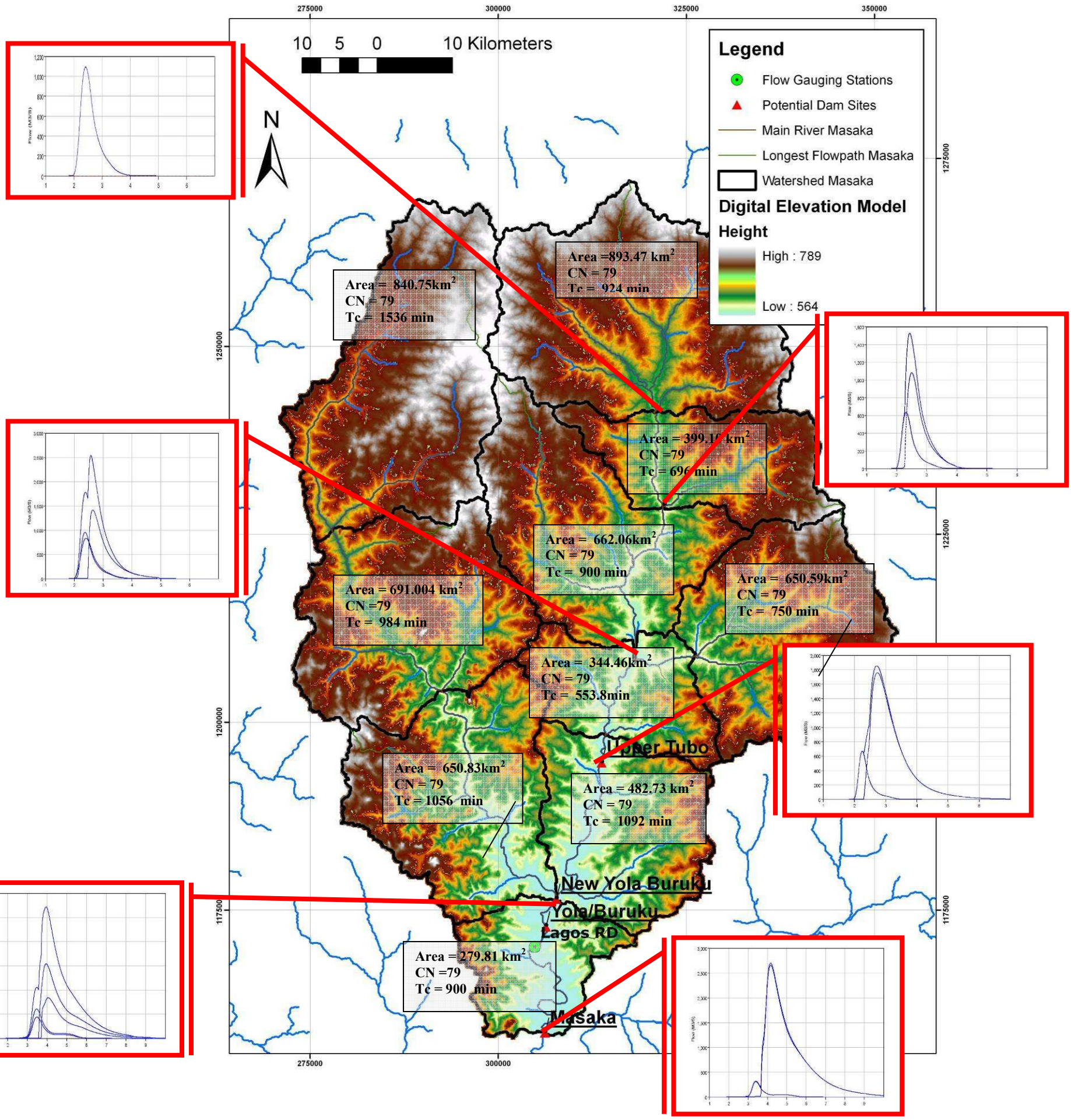
Parameters
alpha 0.054949
lambda 1610.135
m -28218.5

Quantiles
q = F(X) : non-exceedance probability
T = 1/(1-q)

T	q	XT	Standard deviation	Confidence interval (95%)	
10000	0.9999	3880	1130	N/D	N/D
2000	0.9995	3550	900	N/D	N/D
1000	0.999	3390	803	N/D	N/D
200	0.995	3000	586	1850	4150
100	0.99	2810	498	1830	3780
50	0.98	2600	414	1790	3420
20	0.95	2300	316	1670	2920
10	0.9	2020	257	1520	2530
5	0.8	1700	216	1270	2120
3	0.6667	1400	200	1010	1790
2	0.5	1080	196	693	1460

Appendix E: Hydrologic simulations

1- Tubo River Hydrologic Simulation



1.1 Upper Tubo hydrographs

Upper Tubo Hydrographs

Day	Time	100-Year	1000-Year	10000-Year
Day 1	0:00	0.000	0.000	0.000
	0:05	0.000	0.000	0.001
	0:10	0.000	0.000	0.001
	0:15	0.000	0.000	0.002
	0:20	0.000	0.000	0.002
	0:25	0.000	0.000	0.003
	0:30	0.000	0.000	0.004
	0:35	0.000	0.000	0.005
	0:40	0.000	0.000	0.007
	0:45	0.000	0.000	0.009
	0:50	0.000	0.000	0.011
	0:55	0.000	0.000	0.014
	1:00	0.000	0.000	0.017
	1:05	0.000	0.000	0.020
	1:10	0.000	0.000	0.024
	1:15	0.000	0.000	0.028
	1:20	0.000	0.000	0.033
	1:25	0.000	0.000	0.039
	1:30	0.000	0.000	0.046
	1:35	0.000	0.000	0.053
	1:40	0.000	0.000	0.061
	1:45	0.000	0.000	0.069
	1:50	0.000	0.000	0.079
	1:55	0.000	0.000	0.089
	2:00	0.000	0.000	0.101
	2:05	0.000	0.000	0.114
	2:10	0.000	0.000	0.127
	2:15	0.000	0.000	0.142
	2:20	0.000	0.000	0.159
	2:25	0.000	0.000	0.177
	2:30	0.000	0.000	0.196
	2:35	0.000	0.000	0.216
	2:40	0.000	0.000	0.239
	2:45	0.000	0.000	0.263
	2:50	0.000	0.001	0.288
	2:55	0.000	0.001	0.316
	3:00	0.000	0.001	0.346
	3:05	0.000	0.002	0.377
	3:10	0.000	0.002	0.411
	3:15	0.000	0.003	0.446
	3:20	0.000	0.004	0.484
	3:25	0.000	0.005	0.525
	3:30	0.000	0.006	0.567
	3:35	0.000	0.008	0.612
	3:40	0.000	0.010	0.660
	3:45	0.000	0.012	0.709
	3:50	0.000	0.015	0.762
	3:55	0.000	0.018	0.817
	4:00	0.000	0.021	0.875
	4:05	0.000	0.025	0.935
	4:10	0.000	0.029	0.998
	4:15	0.000	0.034	1.064
	4:20	0.000	0.039	1.133
	4:25	0.000	0.045	1.204
	4:30	0.000	0.051	1.279
	4:35	0.000	0.058	1.356
	4:40	0.000	0.066	1.435
	4:45	0.000	0.075	1.518
	4:50	0.000	0.084	1.603
	4:55	0.000	0.094	1.692
	5:00	0.000	0.106	1.783
	5:05	0.000	0.118	1.876
	5:10	0.000	0.131	1.973
	5:15	0.000	0.145	2.073
	5:20	0.000	0.161	2.175
	5:25	0.000	0.178	2.280
	5:30	0.000	0.196	2.388
	5:35	0.000	0.215	2.499
	5:40	0.000	0.236	2.612
	5:45	0.000	0.258	2.729
	5:50	0.000	0.281	2.848
	5:55	0.000	0.307	2.970
	6:00	0.000	0.333	3.095
	6:05	0.000	0.362	3.223
	6:10	0.000	0.392	3.353
	6:15	0.000	0.424	3.487
	6:20	0.000	0.458	3.622
	6:25	0.000	0.493	3.761
	6:30	0.000	0.531	3.902
	6:35	0.000	0.570	4.046
	6:40	0.001	0.612	4.193
	6:45	0.001	0.655	4.342
	6:50	0.001	0.701	4.493
	6:55	0.002	0.749	4.647
	7:00	0.002	0.798	4.804
	7:05	0.003	0.850	4.963
	7:10	0.004	0.904	5.125
	7:15	0.005	0.960	5.289
	7:20	0.006	1.019	5.455
	7:25	0.007	1.079	5.624
	7:30	0.009	1.142	5.795
	7:35	0.011	1.207	5.968
	7:40	0.013	1.274	6.144
	7:45	0.015	1.344	6.322
	7:50	0.018	1.416	6.502
	7:55	0.021	1.489	6.684
	8:00	0.024	1.566	6.869
	8:05	0.028	1.644	7.055
	8:10	0.033	1.724	7.243
	8:15	0.037	1.807	7.434
	8:20	0.043	1.892	7.626
	8:25	0.048	1.979	7.821
	8:30	0.055	2.069	8.017
	8:35	0.062	2.160	8.215
	8:40	0.069	2.254	8.415
	8:45	0.078	2.350	8.617
	8:50	0.086	2.447	8.819
	8:55	0.096	2.546	9.022
	9:00	0.106	2.647	9.226
	9:05	0.117	2.749	9.430
	9:10	0.128	2.853	9.635
	9:15	0.141	2.958	9.841
	9:20	0.154	3.065	10.047
	9:25	0.167	3.172	10.252
	9:30	0.182	3.281	10.456
	9:35	0.197	3.390	10.659
	9:40	0.212	3.499	10.861
	9:45	0.229	3.609	11.062
	9:50	0.246	3.720	11.262
	9:55	0.264	3.831	11.461
	10:00	0.282	3.943	11.657
	10:05	0.302	4.054	11.852
	10:10	0.322	4.166	12.045
	10:15	0.343	4.278	12.236
	10:20	0.364	4.389	12.425
	10:25	0.387	4.501	12.612
	10:30	0.409	4.612	12.796
	10:35	0.433	4.722	12.977
	10:40	0.457	4.831	13.154
	10:45	0.482	4.940	13.328
	10:50	0.507	5.048	13.499
	10:55	0.533	5.154	13.666
	11:00	0.560	5.260	13.830
	11:05	0.586	5.364	13.989
	11:10	0.614	5.466	14.142
	11:15	0.641	5.565	14.291
	11:20	0.669	5.663	14.435
	11:25	0.697	5.759	14.574
	11:30	0.725	5.853	14.707
	11:35	0.754	5.943	14.835
	11:40	0.782	6.032	14.956
	11:45	0.811	6.117	15.071
	11:50	0.839	6.199	15.179
	11:55	0.867	6.278	15.281

Upper Tubo Hydrographs

Day	Time	100-Year	1000-Year	10000-Year
Day 1	12:00	0.895	6.354	15.376
	12:05	0.923	6.426	15.465
	12:10	0.951	6.496	15.547
	12:15	0.979	6.563	15.623
	12:20	1.007	6.627	15.693
	12:25	1.034	6.687	15.757
	12:30	1.061	6.745	15.815
	12:35	1.088	6.800	15.867
	12:40	1.115	6.851	15.913
	12:45	1.141	6.900	15.953
	12:50	1.168	6.947	15.989
	12:55	1.194	6.991	16.020
	13:00	1.219	7.033	16.046
	13:05	1.245	7.072	16.067
	13:10	1.270	7.108	16.083
	13:15	1.294	7.142	16.095
	13:20	1.319	7.174	16.103
	13:25	1.343	7.204	16.107
	13:30	1.367	7.232	16.108
	13:35	1.391	7.258	16.105
	13:40	1.415	7.282	16.099
	13:45	1.438	7.304	16.089
	13:50	1.461	7.325	16.076
	13:55	1.485	7.345	16.062
	14:00	1.508	7.363	16.045
	14:05	1.530	7.380	16.026
	14:10	1.553	7.395	16.005
	14:15	1.576	7.410	15.981
	14:20	1.598	7.423	15.956
	14:25	1.620	7.435	15.929
	14:30	1.642	7.446	15.900
	14:35	1.664	7.456	15.870
	14:40	1.686	7.465	15.839
	14:45	1.707	7.473	15.806
	14:50	1.729	7.480	15.771
	14:55	1.750	7.486	15.735
	15:00	1.771	7.492	15.700
	15:05	1.792	7.498	15.664
	15:10	1.813	7.504	15.629
	15:15	1.834	7.510	15.594
	15:20	1.855	7.515	15.559
	15:25	1.876	7.521	15.524
	15:30	1.897	7.526	15.490
	15:35	1.918	7.532	15.456
	15:40	1.938	7.537	15.423
	15:45	1.959	7.543	15.390
	15:50	1.980	7.549	15.358
	15:55	2.001	7.555	15.327
	16:00	2.021	7.561	15.296
	16:05	2.042	7.567	15.266
	16:10	2.063	7.574	15.238
	16:15	2.083	7.581	15.210
	16:20	2.104	7.589	15.184
	16:25	2.125	7.597	15.159
	16:30	2.146	7.605	15.135
	16:35	2.167	7.614	15.112
	16:40	2.188	7.624	15.091
	16:45	2.209	7.634	15.073
	16:50	2.231	7.645	15.056
	16:55	2.253	7.658	15.041
	17:00	2.274	7.671	15.028
	17:05	2.297	7.685	15.018
	17:10	2.319	7.701	15.010
	17:15	2.342	7.717	15.004
	17:20	2.365	7.735	15.002
	17:25	2.388	7.755	15.003
	17:30	2.412	7.776	15.006
	17:35	2.437	7.798	15.013
	17:40	2.462	7.822	15.023
	17:45	2.487	7.847	15.035
	17:50	2.513	7.874	15.050
	17:55	2.539	7.902	15.067
	18:00	2.565	7.931	15.087
	18:05	2.592	7.961	15.110
	18:10	2.619	7.993	15.135
	18:15	2.647	8.026	15.163
	18:20	2.675	8.060	15.193
	18:25	2.704	8.095	15.225
	18:30	2.733	8.131	15.258
	18:35	2.762	8.168	15.294
	18:40	2.792	8.206	15.332
	18:45	2.822	8.245	15.371
	18:50	2.852	8.285	15.412
	18:55	2.883	8.325	15.455
	19:00	2.914	8.367	15.500
	19:05	2.946	8.410	15.547
	19:10	2.978	8.453	15.595
	19:15	3.010	8.498	15.646
	19:20	3.043	8.544	15.698
	19:25	3.076	8.590	15.752
	19:30	3.110	8.638	15.808
	19:35	3.144	8.686	15.865
	19:40	3.178	8.735	15.924
	19:45	3.213	8.785	15.984
	19:50	3.248	8.836	16.047
	19:55	3.283	8.888	16.111
	20:00	3.319	8.941	16.176
	20:05	3.356	8.995	16.243
	20:10	3.392	9.049	16.311
	20:15	3.430	9.104	16.381
	20:20	3.467	9.160	16.452
	20:25	3.505	9.217	16.525
	20:30	3.543	9.275	16.599
	20:35	3.582	9.333	16.675
	20:40	3.621	9.393	16.752
	20:45	3.661	9.453	16.831
	20:50	3.701	9.515	16.911
	20:55	3.742	9.577	16.994
	21:00	3.783	9.641	17.078
	21:05	3.825	9.705	17.164
	21:10	3.867	9.771	17.251
	21:15	3.910	9.837	17.340
	21:20	3.953	9.905	17.431
	21:25	3.997	9.973	17.524
	21:30	4.041	10.043	17.618
	21:35	4.086	10.114	17.714
	21:40	4.131	10.186	17.813
	21:45	4.177	10.259	17.913
	21:50	4.224	10.334	18.015
	21:55	4.272	10.409	18.120
	22:00	4.320	10.486	18.226
	22:05	4.369	10.565	18.335
	22:10	4.418	10.644	18.446
	22:15	4.468	10.725	18.559
	22:20	4.519	10.807	18.673
	22:25	4.570	10.891	18.790
	22:30	4.623	10.975	18.909
	22:35	4.676	11.061	19.030
	22:40	4.729	11.149	19.153
	22:45	4.784	11.238	19.278
	22:50	4.839	11.328	19.406
	22:55	4.895	11.420	19.535
	23:00	4.952	11.513	19.668
	23:05	5.010	11.608	19.802
	23:10	5.068	11.704	19.940
	23:15	5.128	11.802	20.079
	23:20	5.188	11.902	20.222
	23:25	5.250	12.003	20.366
	23:30	5.312	12.106	20.514
	23:35	5.376	12.211	20.664
	23:40	5.440	12.317	20.816
	23:45	5.505	12.425	20.972
	23:50	5.571	12.536	21.130
	23:55	5.639	12.648	21.291

Upper Tubo Hydrographs

Day	Time	100-Year	1000-Year	10000-Year
Day 2	0:00	5.707	12.761	21.455
	0:05	5.777	12.877	21.622
	0:10	5.848	12.995	21.792
	0:15	5.920	13.115	21.965
	0:20	5.992	13.236	22.141
	0:25	6.067	13.360	22.320
	0:30	6.142	13.486	22.502
	0:35	6.218	13.613	22.687
	0:40	6.296	13.743	22.874
	0:45	6.375	13.874	23.065
	0:50	6.455	14.008	23.259
	0:55	6.536	14.144	23.456
	1:00	6.618	14.282	23.656
	1:05	6.702	14.422	23.860
	1:10	6.787	14.564	24.066
	1:15	6.873	14.708	24.276
	1:20	6.961	14.855	24.489
	1:25	7.050	15.003	24.705
	1:30	7.140	15.154	24.924
	1:35	7.232	15.307	25.147
	1:40	7.325	15.463	25.373
	1:45	7.419	15.621	25.602
	1:50	7.515	15.781	25.835
	1:55	7.613	15.943	26.071
	2:00	7.711	16.108	26.311
	2:05	7.812	16.275	26.554
	2:10	7.913	16.445	26.800
	2:15	8.017	16.617	27.051
	2:20	8.122	16.792	27.304
	2:25	8.228	16.969	27.562
	2:30	8.336	17.149	27.824
	2:35	8.446	17.332	28.089
	2:40	8.558	17.517	28.359
	2:45	8.671	17.706	28.632
	2:50	8.786	17.896	28.909
	2:55	8.902	18.089	29.189
	3:00	9.020	18.285	29.472
	3:05	9.139	18.482	29.759
	3:10	9.260	18.683	30.049
	3:15	9.383	18.885	30.343
	3:20	9.507	19.090	30.640
	3:25	9.632	19.297	30.939
	3:30	9.759	19.506	31.242
	3:35	9.887	19.717	31.547
	3:40	10.017	19.930	31.855
	3:45	10.147	20.146	32.166
	3:50	10.280	20.363	32.480
	3:55	10.414	20.583	32.797
	4:00	10.549	20.804	33.116
	4:05	10.685	21.027	33.438
	4:10	10.823	21.253	33.763
	4:15	10.963	21.481	34.092
	4:20	11.104	21.711	34.423
	4:25	11.246	21.943	34.757
	4:30	11.390	22.178	35.094
	4:35	11.536	22.414	35.434
	4:40	11.682	22.652	35.776
	4:45	11.831	22.893	36.121
	4:50	11.980	23.136	36.469
	4:55	12.132	23.381	36.820
	5:00	12.285	23.628	37.175
	5:05	12.439	23.877	37.531
	5:10	12.595	24.128	37.890
	5:15	12.752	24.381	38.252
	5:20	12.911	24.636	38.616
	5:25	13.071	24.893	38.983
	5:30	13.233	25.153	39.354
	5:35	13.396	25.415	39.727
	5:40	13.562	25.678	40.103
	5:45	13.728	25.945	40.482
	5:50	13.901	26.221	40.876
	5:55	14.081	26.508	41.284
	6:00	14.268	26.806	41.709
	6:05	14.462	27.115	42.149
	6:10	14.664	27.437	42.608
	6:15	14.874	27.772	43.085
	6:20	15.095	28.124	43.586
	6:25	15.331	28.500	44.123
	6:30	15.584	28.902	44.696
	6:35	15.853	29.331	45.308
	6:40	16.139	29.788	45.960
	6:45	16.445	30.275	46.654
	6:50	16.770	30.793	47.393
	6:55	17.118	31.347	48.183
	7:00	17.491	31.940	49.029
	7:05	17.891	32.575	49.934
	7:10	18.317	33.252	50.899
	7:15	18.773	33.975	51.929
	7:20	19.259	34.746	53.027
	7:25	19.779	35.568	54.197
	7:30	20.337	36.450	55.453
	7:35	20.937	37.396	56.800
	7:40	21.580	38.410	58.243
	7:45	22.269	39.495	59.787
	7:50	23.017	40.670	61.460
	7:55	23.829	41.941	63.270
	8:00	24.709	43.317	65.225
	8:05	25.667	44.811	67.354
	8:10	26.709	46.431	69.677
	8:15	27.840	48.187	72.211
	8:20	29.082	50.107	75.002
	8:25	30.453	52.219	78.092
	8:30	31.965	54.540	81.506
	8:35	33.618	57.068	85.248
	8:40	35.440	59.843	89.370
	8:45	37.495	62.956	93.994
	8:50	40.011	66.722	99.528
	8:55	42.760	70.821	105.556
	9:00	45.733	75.240	112.063
	9:05	48.944	80.000	119.072
	9:10	52.388	85.090	126.565
	9:15	56.102	90.562	134.613
	9:20	60.217	96.599	143.448
	9:25	64.836	103.341	153.250
	9:30	69.733	110.472	163.606
	9:35	74.894	117.972	174.490
	9:40	80.324	125.845	185.905
	9:45	86.012	134.078	197.830
	9:50	91.964	142.676	210.274
	9:55	98.268	151.764	223.397
	10:00	104.891	161.293	237.136
	10:05	111.771	171.177	251.382
	10:10	118.910	181.421	266.141
	10:15	126.298	192.006	281.389
	10:20	133.936	202.934	297.130
	10:25	141.858	214.252	313.430
	10:30	150.265	226.240	330.653
	10:35	158.964	238.626	348.454
	10:40	167.920	251.362	366.776
	10:45	177.141	264.458	385.637
	10:50	186.609	277.886	405.010
	10:55	196.344	291.675	424.940
	11:00	206.448	305.967	445.625
	11:05	217.075	320.969	467.345
	11:10	227.947	336.296	489.614
	11:15	239.038	351.910	512.397
	11:20	250.346	367.804	535.707
	11:25	261.853	383.956	559.533
	11:30	273.566	400.374	583.913
	11:35	285.595	417.210	609.074
	11:40	297.888	434.388	634.943
	11:45	310.278	451.675	661.243
	11:50	322.727	469.018	687.941
	11:55	335.226	486.403	715.053

Upper Tubo Hydrographs

Day	Time	100-Year	1000-Year	10000-Year
Day 2	12:00	347.731	503.769	742.536
	12:05	360.150	520.986	770.260
	12:10	372.266	537.758	797.881
	12:15	384.211	554.265	825.674
	12:20	396.012	570.545	853.734
	12:25	407.633	586.553	882.055
	12:30	419.075	602.288	910.678
	12:35	430.282	617.673	939.538
	12:40	441.116	632.517	968.423
	12:45	451.304	646.444	996.882
	12:50	461.181	659.920	1025.555
	12:55	470.755	672.957	1054.488
	13:00	480.005	685.530	1083.671
	13:05	488.929	697.654	1113.120
	13:10	497.482	709.414	1142.772
	13:15	505.472	720.964	1172.299
	13:20	512.860	732.583	1201.662
	13:25	519.881	744.787	1231.282
	13:30	526.531	757.653	1261.133
	13:35	532.810	771.210	1291.212
	13:40	538.711	785.439	1321.482
	13:45	544.190	800.258	1351.838
	13:50	548.969	815.253	1381.754
	13:55	553.254	830.676	1411.573
	14:00	557.168	846.658	1441.485
	14:05	560.696	863.136	1471.425
	14:10	563.846	880.071	1501.353
	14:15	566.625	897.416	1531.205
	14:20	569.023	915.111	1560.940
	14:25	570.912	932.934	1590.292
	14:30	572.439	951.039	1619.482
	14:35	573.607	969.379	1648.465
	14:40	574.405	987.890	1677.178
	14:45	574.844	1006.537	1705.598
	14:50	574.896	1025.234	1733.632
	14:55	574.391	1043.698	1760.932
	15:00	573.242	1061.759	1787.295
	15:05	571.733	1079.746	1813.148
	15:10	570.090	1097.636	1838.464
	15:15	568.972	1115.412	1863.265
	15:20	568.986	1133.070	1887.576
	15:25	570.262	1150.583	1911.385
	15:30	572.681	1167.868	1934.599
	15:35	576.133	1184.930	1957.253
	15:40	580.511	1201.786	1979.396
	15:45	585.706	1218.430	2001.054
	15:50	591.605	1234.840	2022.236
	15:55	598.111	1250.985	2042.945
	16:00	605.125	1266.811	2063.158
	16:05	612.489	1282.178	2082.776
	16:10	620.203	1297.186	2102.058
	16:15	628.216	1311.847	2121.174
	16:20	636.477	1326.150	2140.280
	16:25	644.934	1340.080	2159.558
	16:30	653.524	1353.604	2179.182
	16:35	662.144	1366.623	2199.249
	16:40	670.687	1379.035	2219.833
	16:45	679.244	1391.006	2241.326
	16:50	687.799	1402.541	2263.853
	16:55	696.313	1413.606	2287.432
	17:00	704.759	1424.192	2312.075
	17:05	713.108	1434.304	2337.783
	17:10	721.256	1443.836	2364.363
	17:15	729.227	1452.852	2391.803
	17:20	737.096	1461.503	2420.166
	17:25	744.864	1469.857	2449.361
	17:30	752.514	1478.022	2479.258
	17:35	760.053	1486.233	2509.766
	17:40	767.518	1494.905	2540.850
	17:45	775.036	1504.668	2572.621
	17:50	782.475	1515.794	2604.733
	17:55	789.808	1528.584	2637.042
	18:00	797.054	1543.233	2669.508
	18:05	804.203	1559.729	2702.037
	18:10	811.277	1577.990	2734.591
	18:15	818.352	1597.943	2767.235
	18:20	825.556	1619.559	2800.125
	18:25	832.676	1642.340	2832.816
	18:30	839.695	1666.066	2865.220
	18:35	846.614	1690.557	2897.281
	18:40	853.409	1715.605	2928.876
	18:45	860.054	1741.017	2959.886
	18:50	866.581	1766.716	2990.343
	18:55	873.003	1792.620	3020.266
	19:00	879.277	1818.577	3049.562
	19:05	885.403	1844.501	3078.201
	19:10	891.378	1870.312	3106.155
	19:15	897.202	1895.943	3133.402
	19:20	902.875	1921.338	3159.926
	19:25	908.470	1946.523	3185.809
	19:30	914.111	1971.388	3210.944
	19:35	920.487	1995.850	3235.259
	19:40	928.579	2019.873	3258.737
	19:45	938.922	2043.428	3281.370
	19:50	951.473	2066.502	3303.170
	19:55	965.913	2089.106	3324.180
	20:00	981.914	2111.327	3344.531
	20:05	999.003	2133.002	3364.032
	20:10	1016.868	2154.108	3382.668
	20:15	1035.266	2174.639	3400.452
	20:20	1053.994	2194.583	3417.378
	20:25	1072.882	2213.916	3433.432
	20:30	1091.790	2232.611	3448.585
	20:35	1110.610	2250.648	3462.827
	20:40	1129.267	2268.039	3476.186
	20:45	1147.693	2284.784	3488.675
	20:50	1165.836	2300.879	3500.302
	20:55	1183.655	2316.329	3511.084
	21:00	1201.122	2331.141	3521.042
	21:05	1218.250	2345.373	3530.260
	21:10	1235.001	2359.004	3538.720
	21:15	1251.345	2372.018	3546.411
	21:20	1267.263	2384.408	3553.328
	21:25	1282.741	2396.164	3559.460
	21:30	1297.758	2407.266	3564.794
	21:35	1312.336	2417.766	3569.393
	21:40	1326.481	2427.683	3573.298
	21:45	1340.201	2437.036	3576.538
	21:50	1353.498	2445.839	3579.135
	21:55	1366.378	2454.101	3581.107
	22:00	1378.845	2461.838	3582.477
	22:05	1390.915	2469.076	3583.282
	22:10	1402.630	2475.877	3583.604
	22:15	1414.018	2482.281	3583.492
	22:20	1425.015	2488.196	3582.826
	22:25	1435.606	2493.597	3581.584
	22:30	1445.825	2498.545	3579.835
	22:35	1455.675	2503.048	3577.603
	22:40	1465.163	2507.114	3574.896
	22:45	1474.291	2510.753	3571.725
	22:50	1483.070	2513.979	3568.112
	22:55	1491.507	2516.805	3564.076
	23:00	1499.604	2519.237	3559.623
	23:05	1507.365	2521.282	3554.762
	23:10	1514.804	2522.961	3549.527
	23:15	1521.948	2524.320	3543.980
	23:20	1528.840	2525.422	3538.205
	23:25	1535.437	2526.198	3532.106
	23:30	1541.734	2526.645	3525.678
	23:35	1547.742	2526.778	3518.942
	23:40	1553.467	2526.607	3511.910
	23:45	1558.916	2526.142	3504.598
	23:50	1564.091	2525.389	3497.009
	23:55	1569.000	2524.355	3489.155

Upper Tubo Hydrographs

Day	Time	100-Year	1000-Year	10000-Year
Day 3	0:00	1573.649	2523.053	3481.046
	0:05	1578.053	2521.508	3472.716
	0:10	1582.241	2519.765	3464.251
	0:15	1586.213	2517.822	3455.637
	0:20	1589.957	2515.656	3446.820
	0:25	1593.493	2513.295	3437.841
	0:30	1596.827	2510.744	3428.709
	0:35	1599.947	2507.985	3419.399
	0:40	1602.854	2505.022	3409.913
	0:45	1605.553	2501.858	3400.251
	0:50	1608.047	2498.494	3390.414
	0:55	1610.338	2494.937	3380.406
	1:00	1612.435	2491.196	3370.239
	1:05	1614.350	2487.288	3359.945
	1:10	1616.078	2483.207	3349.505
	1:15	1617.616	2478.941	3338.899
	1:20	1618.965	2474.493	3328.131
	1:25	1620.131	2469.871	3317.211
	1:30	1621.126	2465.091	3306.159
	1:35	1621.972	2460.181	3295.010
	1:40	1622.644	2455.107	3283.721
	1:45	1623.145	2449.872	3272.293
	1:50	1623.479	2444.482	3260.733
	1:55	1623.654	2438.951	3249.060
	2:00	1623.681	2433.291	3237.301
	2:05	1623.553	2427.496	3225.436
	2:10	1623.272	2421.562	3213.457
	2:15	1622.839	2415.492	3201.371
	2:20	1622.256	2409.288	3189.176
	2:25	1621.525	2402.953	3176.878
	2:30	1620.652	2396.492	3164.482
	2:35	1619.639	2389.909	3151.993
	2:40	1618.501	2383.223	3139.435
	2:45	1617.233	2376.429	3126.798
	2:50	1615.841	2369.536	3114.096
	2:55	1614.335	2362.556	3101.356
	3:00	1612.708	2355.480	3088.552
	3:05	1610.956	2348.299	3075.673
	3:10	1609.081	2341.014	3062.721
	3:15	1607.084	2333.628	3049.697
	3:20	1604.968	2326.143	3036.605
	3:25	1602.734	2318.559	3023.446
	3:30	1600.382	2310.880	3010.222
	3:35	1597.917	2303.108	2996.938
	3:40	1595.341	2295.250	2983.601
	3:45	1592.664	2287.316	2970.226
	3:50	1589.890	2279.314	2956.819
	3:55	1587.013	2271.233	2943.367
	4:00	1584.036	2263.076	2929.873
	4:05	1580.959	2254.845	2916.337
	4:10	1577.787	2246.543	2902.764
	4:15	1574.521	2238.173	2889.155
	4:20	1571.163	2229.736	2875.513
	4:25	1567.715	2221.235	2861.842
	4:30	1564.180	2212.672	2848.142
	4:35	1560.560	2204.052	2834.419
	4:40	1556.860	2195.381	2820.684
	4:45	1553.083	2186.664	2806.942
	4:50	1549.230	2177.900	2793.189
	4:55	1545.307	2169.098	2779.438
	5:00	1541.310	2160.249	2765.675
	5:05	1537.238	2151.355	2751.903
	5:10	1533.094	2142.417	2738.122
	5:15	1528.880	2133.438	2724.337
	5:20	1524.597	2124.420	2710.548
	5:25	1520.248	2115.365	2696.758
	5:30	1515.835	2106.276	2682.970
	5:35	1511.360	2097.156	2669.189
	5:40	1506.825	2088.007	2655.414
	5:45	1502.231	2078.830	2641.647
	5:50	1497.581	2069.626	2627.889
	5:55	1492.876	2060.399	2614.144
	6:00	1488.123	2051.158	2600.423
	6:05	1483.324	2041.903	2586.727
	6:10	1478.476	2032.631	2573.050
	6:15	1473.581	2023.343	2559.394
	6:20	1468.641	2014.043	2545.762
	6:25	1463.661	2004.737	2532.166
	6:30	1458.646	1995.436	2518.616
	6:35	1453.597	1986.138	2505.111
	6:40	1448.512	1976.837	2491.642
	6:45	1443.391	1967.534	2478.209
	6:50	1438.236	1958.230	2464.812
	6:55	1433.047	1948.927	2451.452
	7:00	1427.826	1939.624	2438.129
	7:05	1422.577	1930.327	2424.848
	7:10	1417.304	1921.040	2411.616
	7:15	1412.003	1911.758	2398.423
	7:20	1406.675	1902.481	2385.270
	7:25	1401.321	1893.211	2372.157
	7:30	1395.942	1883.947	2359.084
	7:35	1390.539	1874.690	2346.051
	7:40	1385.113	1865.440	2333.057
	7:45	1379.665	1856.198	2320.104
	7:50	1374.195	1846.966	2307.192
	7:55	1368.704	1837.743	2294.322
	8:00	1363.195	1828.531	2281.495
	8:05	1357.667	1819.331	2268.711
	8:10	1352.121	1810.144	2255.972
	8:15	1346.562	1800.974	2243.284
	8:20	1340.992	1791.828	2230.652
	8:25	1335.410	1782.701	2218.074
	8:30	1329.815	1773.591	2205.545
	8:35	1324.210	1764.501	2193.065
	8:40	1318.594	1755.430	2180.636
	8:45	1312.969	1746.380	2168.258
	8:50	1307.338	1737.355	2155.935
	8:55	1301.702	1728.354	2143.666
	9:00	1296.062	1719.378	2131.452
	9:05	1290.418	1710.428	2119.294
	9:10	1284.772	1701.504	2107.190
	9:15	1279.123	1692.608	2095.143
	9:20	1273.475	1683.739	2083.152
	9:25	1267.828	1674.902	2071.221
	9:30	1262.184	1666.096	2059.351
	9:35	1256.544	1657.323	2047.541
	9:40	1250.908	1648.582	2035.793
	9:45	1245.278	1639.876	2024.108
	9:50	1239.655	1631.206	2012.488
	9:55	1234.041	1622.575	2000.936
	10:00	1228.439	1613.983	1989.453
	10:05	1222.848	1605.435	1978.044
	10:10	1217.271	1596.931	1966.711
	10:15	1211.707	1588.469	1955.448
	10:20	1206.155	1580.048	1944.254
	10:25	1200.617	1571.668	1933.129
	10:30	1195.094	1563.332	1922.077
	10:35	1189.587	1555.041	1911.098
	10:40	1184.098	1546.795	1900.191
	10:45	1178.626	1538.594	1889.357
	10:50	1173.171	1530.439	1878.595
	10:55	1167.736	1522.331	1867.907
	11:00	1162.320	1514.269	1857.294
	11:05	1156.927	1506.258	1846.758
	11:10	1151.556	1498.297	1836.301
	11:15	1146.208	1490.388	1825.922
	11:20	1140.885	1482.529	1815.621
	11:25	1135.585	1474.722	1805.399
	11:30	1130.310	1466.968	1795.257
	11:35	1125.062	1459.268	1785.197
	11:40	1119.843	1451.625	1775.221
	11:45	1114.652	1444.038	1765.330
	11:50	1109.492	1436.511	1755.526
	11:55	1104.364	1429.045	1745.814

Upper Tubo Hydrographs

Day	Time	100-Year	1000-Year	10000-Year
Day 3	12:00	1099.269	1421.641	1736.193
	12:05	1094.205	1414.297	1726.659
	12:10	1089.172	1407.010	1717.210
	12:15	1084.170	1399.781	1707.845
	12:20	1079.200	1392.610	1698.565
	12:25	1074.261	1385.498	1689.370
	12:30	1069.354	1378.445	1680.261
	12:35	1064.482	1371.453	1671.238
	12:40	1059.645	1364.524	1662.308
	12:45	1054.847	1357.661	1653.471
	12:50	1050.079	1350.855	1644.716
	12:55	1045.342	1344.104	1636.041
	13:00	1040.637	1337.409	1627.447
	13:05	1035.962	1330.770	1618.933
	13:10	1031.319	1324.186	1610.499
	13:15	1026.706	1317.656	1602.142
	13:20	1022.120	1311.176	1593.858
	13:25	1017.562	1304.747	1585.648
	13:30	1013.033	1298.369	1577.512
	13:35	1008.533	1292.043	1569.450
	13:40	1004.062	1285.768	1561.462
	13:45	999.621	1279.547	1553.552
	13:50	995.207	1273.374	1545.711
	13:55	990.818	1267.247	1537.938
	14:00	986.456	1261.168	1530.233
	14:05	982.120	1255.135	1522.595
	14:10	977.810	1249.149	1515.024
	14:15	973.527	1243.210	1507.520
	14:20	969.270	1237.318	1500.083
	14:25	965.039	1231.470	1492.711
	14:30	960.833	1225.667	1485.402
	14:35	956.653	1219.909	1478.159
	14:40	952.499	1214.197	1470.980
	14:45	948.370	1208.529	1463.865
	14:50	944.268	1202.907	1456.815
	14:55	940.192	1197.329	1449.826
	15:00	936.138	1191.791	1442.896
	15:05	932.107	1186.294	1436.023
	15:10	928.099	1180.836	1429.208
	15:15	924.115	1175.419	1422.450
	15:20	920.154	1170.042	1415.748
	15:25	916.216	1164.706	1409.103
	15:30	912.301	1159.409	1402.515
	15:35	908.411	1154.153	1395.984
	15:40	904.544	1148.936	1389.509
	15:45	900.699	1143.758	1383.087
	15:50	896.877	1138.618	1376.720
	15:55	893.078	1133.517	1370.407
	16:00	889.302	1128.454	1364.147
	16:05	885.548	1123.428	1357.938
	16:10	881.816	1118.438	1351.781
	16:15	878.105	1113.485	1345.674
	16:20	874.417	1108.569	1339.618
	16:25	870.751	1103.688	1333.613
	16:30	867.107	1098.844	1327.657
	16:35	863.485	1094.036	1321.751
	16:40	859.883	1089.261	1315.891
	16:45	856.302	1084.520	1310.078
	16:50	852.741	1079.813	1304.311
	16:55	849.201	1075.139	1298.590
	17:00	845.682	1070.497	1292.913
	17:05	842.182	1065.889	1287.282
	17:10	838.702	1061.311	1281.692
	17:15	835.241	1056.764	1276.145
	17:20	831.798	1052.248	1270.640
	17:25	828.375	1047.762	1265.176
	17:30	824.970	1043.307	1259.753
	17:35	821.584	1038.880	1254.371
	17:40	818.216	1034.483	1249.028
	17:45	814.868	1030.117	1243.727
	17:50	811.539	1025.782	1238.467
	17:55	808.230	1021.477	1233.248
	18:00	804.941	1017.202	1228.069
	18:05	801.671	1012.957	1222.931
	18:10	798.420	1008.742	1217.832
	18:15	795.188	1004.557	1212.774
	18:20	791.978	1000.404	1207.758
	18:25	788.789	996.283	1202.784
	18:30	785.621	992.193	1197.852
	18:35	782.473	988.134	1192.961
	18:40	779.347	984.107	1188.111
	18:45	776.241	980.110	1183.301
	18:50	773.155	976.144	1178.532
	18:55	770.091	972.209	1173.803
	19:00	767.047	968.305	1169.114
	19:05	764.024	964.431	1164.466
	19:10	761.022	960.588	1159.858
	19:15	758.041	956.776	1155.290
	19:20	755.080	952.993	1150.760
	19:25	752.140	949.241	1146.270
	19:30	749.220	945.519	1141.820
	19:35	746.321	941.827	1137.409
	19:40	743.443	938.165	1133.036
	19:45	740.585	934.532	1128.701
	19:50	737.747	930.928	1124.404
	19:55	734.929	927.353	1120.144
	20:00	732.132	923.808	1115.923
	20:05	729.356	920.293	1111.741
	20:10	726.601	916.807	1107.596
	20:15	723.866	913.351	1103.489
	20:20	721.151	909.923	1099.419
	20:25	718.457	906.524	1095.386
	20:30	715.782	903.154	1091.390
	20:35	713.127	899.811	1087.429
	20:40	710.492	896.497	1083.505
	20:45	707.877	893.210	1079.615
	20:50	705.281	889.950	1075.761
	20:55	702.705	886.718	1071.941
	21:00	700.148	883.513	1068.157
	21:05	697.610	880.336	1064.408
	21:10	695.092	877.185	1060.693
	21:15	692.593	874.062	1057.012
	21:20	690.113	870.964	1053.365
	21:25	687.652	867.893	1049.751
	21:30	685.209	864.848	1046.169
	21:35	682.785	861.828	1042.620
	21:40	680.379	858.833	1039.103
	21:45	677.991	855.863	1035.617
	21:50	675.621	852.918	1032.162
	21:55	673.268	849.997	1028.737
	22:00	670.933	847.101	1025.344
	22:05	668.616	844.228	1021.980
	22:10	666.316	841.379	1018.646
	22:15	664.033	838.554	1015.343
	22:20	661.769	835.753	1012.070
	22:25	659.521	832.976	1008.827
	22:30	657.291	830.222	1005.613
	22:35	655.078	827.491	1002.428
	22:40	652.881	824.784	999.272
	22:45	650.701	822.099	996.145
	22:50	648.538	819.436	993.046
	22:55	646.391	816.797	989.976
	23:00	644.261	814.179	986.933
	23:05	642.147	811.583	983.919
	23:10	640.048	809.009	980.931
	23:15	637.966	806.457	977.972
	23:20	635.900	803.927	975.040
	23:25	633.850	801.419	972.136
	23:30	631.816	798.933	969.260
	23:35	629.798	796.468	966.411
	23:40	627.795	794.025	963.590
	23:45	625.808	791.604	960.796
	23:50	623.837	789.203	958.029
	23:55	621.881	786.824	955.288

Upper Tubo Hydrographs

Day	Time	100-Year	1000-Year	10000-Year
Day 4	0:00	619.941	784.466	952.575
	0:05	618.016	782.129	949.887
	0:10	616.106	779.813	947.226
	0:15	614.211	777.517	944.591
	0:20	612.331	775.242	941.982
	0:25	610.466	772.987	939.399
	0:30	608.617	770.753	936.842
	0:35	606.782	768.539	934.311
	0:40	604.962	766.346	931.805
	0:45	603.157	764.173	929.324
	0:50	601.367	762.019	926.869
	0:55	599.591	759.885	924.438
	1:00	597.829	757.771	922.031
	1:05	596.082	755.676	919.649
	1:10	594.349	753.601	917.292
	1:15	592.630	751.544	914.958
	1:20	590.925	749.507	912.648
	1:25	589.234	747.489	910.362
	1:30	587.557	745.490	908.100
	1:35	585.894	743.509	905.861
	1:40	584.245	741.547	903.646
	1:45	582.609	739.605	901.455
	1:50	580.988	737.680	899.286
	1:55	579.380	735.774	897.140
	2:00	577.785	733.886	895.018
	2:05	576.204	732.017	892.917
	2:10	574.636	730.165	890.839
	2:15	573.081	728.331	888.783
	2:20	571.539	726.515	886.749
	2:25	570.011	724.716	884.737
	2:30	568.495	722.935	882.746
	2:35	566.992	721.171	880.777
	2:40	565.502	719.425	878.828
	2:45	564.025	717.696	876.901
	2:50	562.561	715.983	874.995
	2:55	561.109	714.288	873.109
	3:00	559.670	712.610	871.245
	3:05	558.244	710.948	869.400
	3:10	556.829	709.303	867.577
	3:15	555.428	707.675	865.773
	3:20	554.038	706.063	863.989
	3:25	552.661	704.467	862.224
	3:30	551.295	702.887	860.479
	3:35	549.942	701.323	858.754
	3:40	548.601	699.775	857.047
	3:45	547.272	698.243	855.359
	3:50	545.954	696.727	853.691
	3:55	544.648	695.226	852.040
	4:00	543.354	693.740	850.409
	4:05	542.072	692.270	848.795
	4:10	540.801	690.815	847.200
	4:15	539.542	689.375	845.622
	4:20	538.294	687.950	844.063
	4:25	537.058	686.540	842.520
	4:30	535.832	685.145	840.996
	4:35	534.618	683.764	839.488
	4:40	533.415	682.398	837.997
	4:45	532.224	681.046	836.523
	4:50	531.043	679.708	835.065
	4:55	529.873	678.385	833.624
	5:00	528.714	677.075	832.200
	5:05	527.566	675.780	830.791
	5:10	526.429	674.498	829.399
	5:15	525.303	673.231	828.023
	5:20	524.187	671.976	826.662
	5:25	523.082	670.736	825.316
	5:30	521.988	669.509	823.987
	5:35	520.904	668.295	822.672
	5:40	519.830	667.095	821.372
	5:45	518.767	665.907	820.088
	5:50	517.714	664.733	818.818
	5:55	516.672	663.572	817.563
	6:00	515.640	662.424	816.323
	6:05	514.618	661.289	815.098
	6:10	513.606	660.166	813.887
	6:15	512.605	659.057	812.691
	6:20	511.614	657.960	811.508
	6:25	510.633	656.875	810.339
	6:30	509.661	655.803	809.184
	6:35	508.700	654.742	808.042
	6:40	507.748	653.694	806.913
	6:45	506.806	652.657	805.798
	6:50	505.874	651.632	804.695
	6:55	504.951	650.619	803.604
	7:00	504.038	649.617	802.526
	7:05	503.134	648.626	801.460
	7:10	502.240	647.647	800.405
	7:15	501.355	646.678	799.363
	7:20	500.479	645.721	798.332
	7:25	499.612	644.774	797.313
	7:30	498.754	643.838	796.305
	7:35	497.906	642.912	795.307
	7:40	497.066	641.997	794.321
	7:45	496.235	641.092	793.345
	7:50	495.413	640.197	792.380
	7:55	494.600	639.312	791.424
	8:00	493.795	638.437	790.479
	8:05	492.999	637.572	789.544
	8:10	492.211	636.716	788.618
	8:15	491.432	635.869	787.702
	8:20	490.660	635.032	786.795
	8:25	489.898	634.204	785.897
	8:30	489.143	633.385	785.008
	8:35	488.396	632.574	784.128
	8:40	487.658	631.773	783.257
	8:45	486.927	630.980	782.394
	8:50	486.202	630.192	781.535
	8:55	485.482	629.410	780.680
	9:00	484.767	628.633	779.829
	9:05	484.058	627.860	778.982
	9:10	483.354	627.093	778.138
	9:15	482.655	626.330	777.298
	9:20	481.960	625.570	776.459
	9:25	481.267	624.811	775.618
	9:30	480.575	624.051	774.775
	9:35	479.886	623.292	773.930
	9:40	479.198	622.533	773.082
	9:45	478.511	621.774	772.231
	9:50	477.826	621.014	771.377
	9:55	477.141	620.252	770.517
	10:00	476.455	619.487	769.652
	10:05	475.769	618.719	768.780
	10:10	475.083	617.948	767.901
	10:15	474.396	617.174	767.016
	10:20	473.707	616.396	766.123
	10:25	473.018	615.614	765.223
	10:30	472.326	614.826	764.312
	10:35	471.631	614.030	763.389
	10:40	470.932	613.227	762.455
	10:45	470.229	612.417	761.508
	10:50	469.522	611.599	760.549
	10:55	468.812	610.773	759.577
	11:00	468.097	609.938	758.592
	11:05	467.374	609.091	757.588
	11:10	466.644	608.232	756.565
	11:15	465.907	607.359	755.524
	11:20	465.162	606.474	754.464
	11:25	464.409	605.576	753.385
	11:30	463.648	604.665	752.287
	11:35	462.878	603.738	751.166
	11:40	462.098	602.794	750.022
	11:45	461.307	601.834	748.854
	11:50	460.505	600.856	747.661
	11:55	459.692	599.862	746.444

Upper Tubo Hydrographs

Day	Time	100-Year	1000-Year	10000-Year
Day 4	12:00	458.868	598.849	745.202
	12:05	458.033	597.819	743.935
	12:10	457.189	596.773	742.645
	12:15	456.335	595.712	741.334
	12:20	455.472	594.635	740.001
	12:25	454.599	593.543	738.645
	12:30	453.716	592.434	737.265
	12:35	452.823	591.309	735.863
	12:40	451.921	590.168	734.437
	12:45	451.011	589.016	732.994
	12:50	450.096	587.851	731.533
	12:55	449.173	586.674	730.054
	13:00	448.243	585.485	728.556
	13:05	447.306	584.283	727.039
	13:10	446.362	583.067	725.503
	13:15	445.411	581.841	723.950
	13:20	444.457	580.606	722.383
	13:25	443.498	579.362	720.802
	13:30	442.535	578.108	719.206
	13:35	441.567	576.846	717.596
	13:40	440.594	575.573	715.970
	13:45	439.616	574.290	714.329
	13:50	438.635	573.001	712.676
	13:55	437.653	571.706	711.014
	14:00	436.669	570.406	709.341
	14:05	435.683	569.099	707.657
	14:10	434.695	567.786	705.963
	14:15	433.704	566.466	704.258
	14:20	432.711	565.140	702.542
	14:25	431.716	563.809	700.817
	14:30	430.720	562.473	699.083
	14:35	429.723	561.132	697.339
	14:40	428.724	559.785	695.586
	14:45	427.723	558.433	693.823
	14:50	426.720	557.075	692.051
	14:55	425.715	555.712	690.270
	15:00	424.713	554.348	688.485
	15:05	423.711	552.983	686.696
	15:10	422.711	551.616	684.904
	15:15	421.712	550.248	683.106
	15:20	420.713	548.879	681.305
	15:25	419.716	547.508	679.500
	15:30	418.720	546.135	677.691
	15:35	417.725	544.762	675.878
	15:40	416.731	543.387	674.063
	15:45	415.738	542.012	672.244
	15:50	414.746	540.635	670.421
	15:55	413.755	539.256	668.595
	16:00	412.765	537.877	666.766
	16:05	411.777	536.497	664.934
	16:10	410.790	535.117	663.101
	16:15	409.804	533.737	661.265
	16:20	408.820	532.356	659.428
	16:25	407.837	530.975	657.589
	16:30	406.856	529.593	655.747
	16:35	405.875	528.211	653.904
	16:40	404.898	526.831	652.062
	16:45	403.922	525.452	650.220
	16:50	402.950	524.075	648.379
	16:55	401.979	522.699	646.538
	17:00	401.011	521.324	644.698
	17:05	400.046	519.951	642.859
	17:10	399.084	518.581	641.022
	17:15	398.125	517.215	639.189
	17:20	397.171	515.851	637.360
	17:25	396.220	514.492	635.534
	17:30	395.272	513.136	633.712
	17:35	394.329	511.783	631.893
	17:40	393.388	510.435	630.078
	17:45	392.450	509.087	628.265
	17:50	391.513	507.742	626.453
	17:55	390.578	506.398	624.642
	18:00	389.644	505.055	622.832
	18:05	388.712	503.713	621.023
	18:10	387.781	502.372	619.214
	18:15	386.851	501.030	617.405
	18:20	385.920	499.686	615.591
	18:25	384.989	498.340	613.774
	18:30	384.057	496.991	611.952
	18:35	383.124	495.641	610.127
	18:40	382.191	494.288	608.299
	18:45	381.257	492.934	606.468
	18:50	380.322	491.577	604.634
	18:55	379.387	490.219	602.797
	19:00	378.450	488.858	600.958
	19:05	377.512	487.496	599.115
	19:10	376.573	486.131	597.271
	19:15	375.633	484.765	595.423
	19:20	374.692	483.397	593.574
	19:25	373.749	482.026	591.722
	19:30	372.805	480.654	589.867
	19:35	371.860	479.278	588.009
	19:40	370.913	477.901	586.148
	19:45	369.964	476.521	584.285
	19:50	369.014	475.140	582.419
	19:55	368.062	473.756	580.551
	20:00	367.108	472.369	578.680
	20:05	366.152	470.980	576.805
	20:10	365.194	469.587	574.926
	20:15	364.233	468.191	573.045
	20:20	363.271	466.793	571.160
	20:25	362.306	465.392	569.272
	20:30	361.339	463.988	567.382
	20:35	360.371	462.582	565.489
	20:40	359.400	461.174	563.594
	20:45	358.428	459.764	561.697
	20:50	357.454	458.351	559.797
	20:55	356.478	456.937	557.896
	21:00	355.501	455.521	555.993
	21:05	354.522	454.102	554.088
	21:10	353.541	452.682	552.181
	21:15	352.558	451.259	550.272
	21:20	351.573	449.835	548.361
	21:25	350.586	448.409	546.449
	21:30	349.598	446.981	544.536
	21:35	348.609	445.551	542.622
	21:40	347.617	444.121	540.706
	21:45	346.625	442.689	538.790
	21:50	345.631	441.256	536.874
	21:55	344.636	439.822	534.958
	22:00	343.640	438.387	533.041
	22:05	342.643	436.951	531.124
	22:10	341.644	435.515	529.208
	22:15	340.644	434.077	527.290
	22:20	339.643	432.639	525.373
	22:25	338.640	431.199	523.454
	22:30	337.636	429.758	521.536
	22:35	336.630	428.316	519.618
	22:40	335.624	426.873	517.699
	22:45	334.616	425.430	515.781
	22:50	333.607	423.987	513.864
	22:55	332.597	422.543	511.947
	23:00	331.587	421.099	510.031
	23:05	330.576	419.655	508.116
	23:10	329.564	418.211	506.202
	23:15	328.551	416.766	504.289
	23:20	327.538	415.322	502.376
	23:25	326.523	413.877	500.464
	23:30	325.508	412.433	498.554
	23:35	324.492	410.988	496.644
	23:40	323.476	409.543	494.735
	23:45	322.459	408.098	492.827
	23:50	321.441	406.654	490.921
	23:55	320.423	405.210	489.016

Upper Tubo Hydrographs — Day 5

Time	100-Year	1000-Year	10000-Year
0:00	319.405	403.766	487.113
0:05	318.386	402.323	485.212
0:10	317.368	400.881	483.312
0:15	316.349	399.439	481.414
0:20	315.330	397.998	479.519
0:25	314.310	396.558	477.625
0:30	313.291	395.118	475.732
0:35	312.271	393.679	473.842
0:40	311.251	392.240	471.953
0:45	310.231	390.802	470.066
0:50	309.211	389.366	468.182
0:55	308.191	387.930	466.299
1:00	307.171	386.495	464.419
1:05	306.151	385.061	462.542
1:10	305.132	383.629	460.667
1:15	304.112	382.197	458.794
1:20	303.094	380.768	456.924
1:25	302.075	379.339	455.057
1:30	301.057	377.912	453.192
1:35	300.039	376.486	451.330
1:40	299.021	375.061	449.471
1:45	298.004	373.638	447.614
1:50	296.987	372.216	445.760
1:55	295.971	370.796	443.909
2:00	294.955	369.377	442.061
2:05	293.940	367.960	440.216
2:10	292.925	366.545	438.374
2:15	291.911	365.131	436.535
2:20	290.898	363.719	434.699
2:25	289.885	362.309	432.867
2:30	288.873	360.901	431.038
2:35	287.862	359.495	429.212
2:40	286.852	358.091	427.390
2:45	285.843	356.689	425.571
2:50	284.834	355.288	423.756
2:55	283.827	353.890	421.944
3:00	282.820	352.494	420.136
3:05	281.815	351.100	418.331
3:10	280.810	349.708	416.530
3:15	279.806	348.319	414.733
3:20	278.804	346.932	412.939
3:25	277.802	345.547	411.150
3:30	276.802	344.164	409.364
3:35	275.803	342.784	407.583
3:40	274.806	341.407	405.805
3:45	273.809	340.032	404.032
3:50	272.814	338.659	402.262
3:55	271.820	337.289	400.497
4:00	270.828	335.922	398.736
4:05	269.837	334.557	396.979
4:10	268.847	333.195	395.226
4:15	267.858	331.836	393.478
4:20	266.871	330.479	391.734
4:25	265.886	329.125	389.994
4:30	264.902	327.774	388.259
4:35	263.920	326.426	386.528
4:40	262.939	325.081	384.802
4:45	261.960	323.738	383.080
4:50	260.982	322.399	381.363
4:55	260.006	321.063	379.651
5:00	259.032	319.729	377.943
5:05	258.060	318.399	376.240
5:10	257.089	317.071	374.542
5:15	256.120	315.747	372.848
5:20	255.153	314.426	371.159
5:25	254.187	313.108	369.475
5:30	253.223	311.793	367.795
5:35	252.262	310.481	366.121
5:40	251.302	309.173	364.452
5:45	250.344	307.868	362.797
5:50	249.387	306.566	361.128
5:55	248.433	305.268	359.473
6:00	247.481	303.973	357.824
6:05	246.531	302.681	356.179
6:10	245.582	301.392	354.540
6:15	244.636	300.107	352.905
6:20	243.692	298.826	351.276
6:25	242.749	297.548	349.652
6:30	241.809	296.273	348.033
6:35	240.871	295.001	346.419
6:40	239.935	293.734	344.810
6:45	239.001	292.469	343.207
6:50	238.069	291.209	341.608
6:55	237.139	289.952	340.015
7:00	236.212	288.698	338.428
7:05	235.286	287.448	336.845
7:10	234.363	286.202	335.268
7:15	233.442	284.959	333.696
7:20	232.523	283.720	332.129
7:25	231.607	282.484	330.568
7:30	230.692	281.252	329.012
7:35	229.780	280.024	327.462
7:40	228.870	278.799	325.918
7:45	227.963	277.579	324.376
7:50	227.058	276.361	322.842
7:55	226.155	275.148	321.313
8:00	225.254	273.938	319.799
8:05	224.356	272.732	318.271
8:10	223.460	271.530	316.759
8:15	222.566	270.332	315.251
8:20	221.675	269.138	313.750
8:25	220.786	267.947	312.253
8:30	219.899	266.760	310.763
8:35	219.015	265.577	309.278
8:40	218.134	264.398	307.798
8:45	217.255	263.223	306.324
8:50	216.378	262.052	304.856
8:55	215.504	260.885	303.393
9:00	214.632	259.721	301.935
9:05	213.763	258.562	300.484
9:10	212.896	257.406	299.038
9:15	212.032	256.255	297.597
9:20	211.170	255.107	296.162
9:25	210.311	253.963	294.733
9:30	209.454	252.824	293.310
9:35	208.601	251.688	291.892
9:40	207.749	250.556	290.479
9:45	206.900	249.429	289.073
9:50	206.054	248.305	287.672
9:55	205.210	247.185	286.276
10:00	204.369	246.070	284.887
10:05	203.530	244.958	283.503
10:10	202.694	243.851	282.124
10:15	201.861	242.747	280.751
10:20	201.030	241.648	279.384
10:25	200.202	240.552	278.023
10:30	199.376	239.461	276.667
10:35	198.553	238.373	275.317
10:40	197.733	237.290	273.972
10:45	196.916	236.211	272.633
10:50	196.100	235.135	271.300
10:55	195.288	234.064	269.972
11:00	194.478	232.997	268.651
11:05	193.671	231.934	267.334
11:10	192.867	230.875	266.024
11:15	192.065	229.820	264.719
11:20	191.266	228.770	263.419
11:25	190.470	227.723	262.125
11:30	189.676	226.680	260.837
11:35	188.885	225.642	259.555
11:40	188.097	224.607	258.278
11:45	187.311	223.577	257.007
11:50	186.528	222.551	255.741
11:55	185.748	221.528	254.481
12:00	184.970	220.510	253.227
12:05	184.196	219.496	251.978
12:10	183.423	218.486	250.734
12:15	182.654	217.480	249.497
12:20	181.887	216.478	248.265
12:25	181.123	215.481	247.038
12:30	180.362	214.487	245.817
12:35	179.603	213.497	244.602
12:40	178.847	212.512	243.392
12:45	178.094	211.530	242.187
12:50	177.344	210.553	240.988
12:55	176.596	209.579	239.795
13:00	175.850	208.609	238.606
13:05	175.107	207.643	237.423
13:10	174.367	206.682	236.246
13:15	173.630	205.724	235.074
13:20	172.895	204.770	233.907
13:25	172.163	203.820	232.745
13:30	171.433	202.874	231.589
13:35	170.707	201.932	230.438
13:40	169.982	200.993	229.293
13:45	169.261	200.059	228.153
13:50	168.542	199.129	227.018
13:55	167.825	198.202	225.888
14:00	167.112	197.280	224.763
14:05	166.401	196.361	223.644
14:10	165.692	195.446	222.530
14:15	164.986	194.536	221.422
14:20	164.283	193.629	220.318
14:25	163.583	192.725	219.220
14:30	162.885	191.826	218.127
14:35	162.189	190.931	217.039
14:40	161.497	190.039	215.956
14:45	160.807	189.152	214.878
14:50	160.119	188.268	213.806
14:55	159.434	187.388	212.738
15:00	158.752	186.511	211.676
15:05	158.072	185.639	210.619
15:10	157.395	184.770	209.567
15:15	156.721	183.906	208.519
15:20	156.049	183.045	207.477
15:25	155.380	182.188	206.440
15:30	154.713	181.334	205.408
15:35	154.049	180.484	204.381
15:40	153.388	179.639	203.359
15:45	152.729	178.796	202.342
15:50	152.072	177.958	201.330
15:55	151.419	177.123	200.323
16:00	150.768	176.292	199.321
16:05	150.119	175.465	198.324
16:10	149.473	174.642	197.331
16:15	148.829	173.822	196.344
16:20	148.188	173.006	195.361
16:25	147.550	172.193	194.383
16:30	146.914	171.384	193.410
16:35	146.281	170.579	192.442
16:40	145.650	169.778	191.478
16:45	145.022	168.980	190.520
16:50	144.396	168.186	189.566
16:55	143.773	167.395	188.617
17:00	143.152	166.608	187.672
17:05	142.534	165.825	186.733
17:10	141.918	165.045	185.798
17:15	141.305	164.269	184.867
17:20	140.694	163.496	183.941
17:25	140.086	162.727	183.020
17:30	139.480	161.961	182.104
17:35	138.877	161.199	181.192
17:40	138.276	160.441	180.285
17:45	137.678	159.686	179.382
17:50	137.082	158.934	178.484
17:55	136.489	158.186	177.590
18:00	135.898	157.442	176.701
18:05	135.310	156.701	175.816
18:10	134.724	155.963	174.936
18:15	134.140	155.229	174.060
18:20	133.559	154.498	173.189
18:25	132.980	153.771	172.322
18:30	132.404	153.047	171.460
18:35	131.830	152.327	170.602
18:40	131.258	151.610	169.748
18:45	130.689	150.896	168.899
18:50	130.122	150.185	168.053
18:55	129.558	149.478	167.213
19:00	128.996	148.775	166.376
19:05	128.436	148.074	165.544
19:10	127.879	147.377	164.716
19:15	127.324	146.684	163.892
19:20	126.772	145.993	163.073
19:25	126.222	145.306	162.258
19:30	125.674	144.622	161.447
19:35	125.128	143.941	160.640
19:40	124.585	143.264	159.837
19:45	124.044	142.590	159.038
19:50	123.506	141.919	158.244
19:55	122.970	141.251	157.453
20:00	122.436	140.587	156.667
20:05	121.904	139.925	155.885
20:10	121.374	139.267	155.108
20:15	120.848	138.612	154.332
20:20	120.323	137.960	153.562
20:25	119.800	137.311	152.796
20:30	119.280	136.666	152.033
20:35	118.762	136.023	151.275
20:40	118.246	135.384	150.520
20:45	117.733	134.747	149.770
20:50	117.222	134.114	149.023
20:55	116.713	133.484	148.280
21:00	116.206	132.857	147.541
21:05	115.701	132.232	146.806
21:10	115.199	131.611	146.075
21:15	114.698	130.993	145.347
21:20	114.200	130.378	144.624
21:25	113.704	129.766	143.904
21:30	113.211	129.157	143.188
21:35	112.719	128.550	142.475
21:40	112.230	127.947	141.766
21:45	111.743	127.347	141.061
21:50	111.257	126.749	140.360
21:55	110.774	126.155	139.662
22:00	110.294	125.563	138.968
22:05	109.815	124.974	138.277
22:10	109.338	124.389	137.590
22:15	108.864	123.805	136.907
22:20	108.391	123.225	136.227
22:25	107.920	122.648	135.551
22:30	107.453	122.073	134.879
22:35	106.987	121.502	134.209
22:40	106.523	120.933	133.544
22:45	106.061	120.367	132.882
22:50	105.601	119.803	132.223
22:55	105.143	119.243	131.568
23:00	104.687	118.685	130.916
23:05	104.233	118.130	130.267
23:10	103.781	117.577	129.622
23:15	103.332	117.028	128.981
23:20	102.884	116.481	128.342
23:25	102.438	115.936	127.707
23:30	101.994	115.395	127.076
23:35	101.552	114.856	126.447
23:40	101.113	114.320	125.822
23:45	100.675	113.786	125.200
23:50	100.239	113.255	124.582
23:55	99.805	112.726	123.967

Upper Tubo Hydrographs — Day 6

Time	100-Year	1000-Year	10000-Year
0:00	99.373	112.200	123.355
0:05	98.943	111.677	122.746
0:10	98.515	111.156	122.140
0:15	98.089	110.638	121.538
0:20	97.664	110.123	120.939
0:25	97.242	109.610	120.342
0:30	96.821	109.099	119.749
0:35	96.403	108.591	119.159
0:40	95.986	108.086	118.573
0:45	95.571	107.583	117.989
0:50	95.157	107.082	117.408
0:55	94.747	106.584	116.831
1:00	94.338	106.089	116.256
1:05	93.931	105.595	115.685
1:10	93.525	105.105	115.116
1:15	93.122	104.616	114.550
1:20	92.720	104.130	113.988
1:25	92.320	103.647	113.428
1:30	91.921	103.166	112.871
1:35	91.525	102.687	112.318
1:40	91.130	102.211	111.767
1:45	90.737	101.737	111.219
1:50	90.346	101.265	110.674
1:55	89.957	100.796	110.131
2:00	89.570	100.329	109.592
2:05	89.184	99.864	109.055
2:10	88.800	99.402	108.522
2:15	88.418	98.941	107.991
2:20	88.037	98.484	107.462
2:25	87.658	98.028	106.937
2:30	87.281	97.575	106.414
2:35	86.906	97.124	105.894
2:40	86.532	96.675	105.377
2:45	86.160	96.228	104.863
2:50	85.790	95.784	104.351
2:55	85.421	95.341	103.842
3:00	85.054	94.901	103.336
3:05	84.689	94.463	102.832
3:10	84.325	94.028	102.331
3:15	83.964	93.594	101.832
3:20	83.603	93.163	101.336
3:25	83.245	92.733	100.843
3:30	82.888	92.306	100.352
3:35	82.532	91.881	99.864
3:40	82.179	91.458	99.378
3:45	81.826	91.037	98.895
3:50	81.476	90.619	98.414
3:55	81.127	90.202	97.936
4:00	80.780	89.787	97.461
4:05	80.434	89.375	96.987
4:10	80.090	88.964	96.517
4:15	79.747	88.555	96.048
4:20	79.406	88.149	95.582
4:25	79.067	87.744	95.119
4:30	78.729	87.342	94.658
4:35	78.392	86.941	94.199
4:40	78.057	86.543	93.742
4:45	77.724	86.146	93.288
4:50	77.392	85.752	92.837
4:55	77.062	85.359	92.387
5:00	76.733	84.968	91.940
5:05	76.406	84.579	91.495
5:10	76.080	84.192	91.052
5:15	75.756	83.807	90.611
5:20	75.433	83.424	90.173
5:25	75.112	83.043	89.737
5:30	74.792	82.664	89.303
5:35	74.473	82.286	88.871
5:40	74.156	81.911	88.441
5:45	73.841	81.537	88.014
5:50	73.527	81.165	87.588
5:55	73.214	80.795	87.165
6:00	72.903	80.426	86.744
6:05	72.593	80.060	86.325
6:10	72.285	79.695	85.907
6:15	71.978	79.332	85.492
6:20	71.672	78.971	85.079
6:25	71.368	78.612	84.668
6:30	71.065	78.254	84.259
6:35	70.764	77.898	83.852
6:40	70.464	77.544	83.447
6:45	70.165	77.191	83.043
6:50	69.868	76.841	82.642
6:55	69.572	76.491	82.243
7:00	69.277	76.144	81.845
7:05	68.984	75.798	81.450
7:10	68.692	75.454	81.056
7:15	68.401	75.112	80.664
7:20	68.112	74.771	80.274
7:25	67.824	74.432	79.886
7:30	67.538	74.094	79.500
7:35	67.252	73.758	79.115
7:40	66.968	73.424	78.732
7:45	66.685	73.091	78.351
7:50	66.404	72.760	77.972
7:55	66.124	72.430	77.595
8:00	65.845	72.102	77.219
8:05	65.567	71.775	76.845
8:10	65.291	71.451	76.473
8:15	65.016	71.127	76.102
8:20	64.742	70.805	75.733
8:25	64.470	70.484	75.366
8:30	64.198	70.165	75.001
8:35	63.928	69.848	74.637
8:40	63.659	69.532	74.275
8:45	63.392	69.217	73.914
8:50	63.125	68.904	73.555
8:55	62.860	68.592	73.198
9:00	62.596	68.282	72.842
9:05	62.333	67.973	72.488
9:10	62.071	67.665	72.135
9:15	61.811	67.359	71.784
9:20	61.551	67.055	71.435
9:25	61.293	66.751	71.087
9:30	61.036	66.449	70.741
9:35	60.781	66.149	70.396
9:40	60.526	65.850	70.053
9:45	60.272	65.552	69.711
9:50	60.020	65.255	69.371
9:55	59.769	64.960	69.033
10:00	59.519	64.666	68.695
10:05	59.270	64.373	68.360
10:10	59.022	64.082	68.025
10:15	58.775	63.792	67.693
10:20	58.529	63.503	67.361
10:25	58.285	63.216	67.032
10:30	58.041	62.930	66.703
10:35	57.799	62.645	66.376
10:40	57.558	62.361	66.051
10:45	57.317	62.078	65.726
10:50	57.078	61.797	65.404
10:55	56.840	61.517	65.082
11:00	56.603	61.238	64.762
11:05	56.367	60.961	64.444
11:10	56.132	60.684	64.126
11:15	55.898	60.409	63.811
11:20	55.665	60.135	63.496
11:25	55.433	59.862	63.183
11:30	55.202	59.590	62.871
11:35	54.973	59.319	62.561
11:40	54.744	59.050	62.251
11:45	54.516	58.782	61.944
11:50	54.289	58.514	61.637
11:55	54.063	58.248	61.332
12:00	53.839	57.983	61.028
12:05	53.614	57.719	60.725
12:10	53.391	57.457	60.424
12:15	53.169	57.195	60.124
12:20	52.948	56.934	59.825
12:25	52.728	56.675	59.528
12:30	52.509	56.416	59.232
12:35	52.291	56.159	58.937
12:40	52.073	55.903	58.643
12:45	51.857	55.647	58.351
12:50	51.642	55.393	58.060
12:55	51.427	55.140	57.770
13:00	51.213	54.888	57.481
13:05	51.001	54.637	57.193
13:10	50.789	54.387	56.907
13:15	50.578	54.138	56.622
13:20	50.368	53.890	56.338
13:25	50.159	53.642	56.056
13:30	49.950	53.396	55.774
13:35	49.743	53.151	55.494
13:40	49.536	52.907	55.215
13:45	49.331	52.664	54.937
13:50	49.126	52.422	54.661
13:55	48.922	52.181	54.385
14:00	48.719	51.941	54.111
14:05	48.516	51.701	53.838
14:10	48.315	51.463	53.566
14:15	48.114	51.226	53.295
14:20	47.914	50.989	53.026
14:25	47.715	50.754	52.757
14:30	47.517	50.520	52.490
14:35	47.319	50.286	52.224
14:40	47.123	50.053	51.959
14:45	46.927	49.822	51.695
14:50	46.732	49.591	51.433
14:55	46.537	49.361	51.171
15:00	46.344	49.132	50.911
15:05	46.151	48.904	50.651
15:10	45.959	48.677	50.393
15:15	45.768	48.450	50.136
15:20	45.577	48.225	49.880
15:25	45.388	48.000	49.625
15:30	45.199	47.777	49.372
15:35	45.010	47.554	49.119
15:40	44.823	47.332	48.867
15:45	44.636	47.111	48.617
15:50	44.450	46.891	48.368
15:55	44.265	46.672	48.120
16:00	44.080	46.454	47.872
16:05	43.896	46.236	47.626
16:10	43.713	46.019	47.381
16:15	43.531	45.804	47.138
16:20	43.349	45.589	46.895
16:25	43.168	45.375	46.653
16:30	42.987	45.161	46.412
16:35	42.808	44.949	46.173
16:40	42.629	44.738	45.934
16:45	42.450	44.527	45.697
16:50	42.273	44.317	45.460
16:55	42.096	44.108	45.225
17:00	41.919	43.900	44.991
17:05	41.744	43.692	44.758
17:10	41.569	43.486	44.525
17:15	41.394	43.280	44.294
17:20	41.221	43.075	44.064
17:25	41.048	42.871	43.835
17:30	40.875	42.668	43.607
17:35	40.703	42.465	43.380
17:40	40.532	42.264	43.154
17:45	40.362	42.063	42.929
17:50	40.192	41.863	42.705
17:55	40.023	41.663	42.483
18:00	39.854	41.465	42.261
18:05	39.686	41.267	42.040
18:10	39.519	41.070	41.820
18:15	39.352	40.874	41.601
18:20	39.186	40.679	41.383
18:25	39.020	40.484	41.167
18:30	38.856	40.291	40.951
18:35	38.691	40.098	40.736
18:40	38.528	39.905	40.522
18:45	38.364	39.714	40.309
18:50	38.202	39.523	40.098
18:55	38.040	39.334	39.887
19:00	37.879	39.144	39.677
19:05	37.718	38.956	39.468
19:10	37.558	38.768	39.260
19:15	37.398	38.582	39.053
19:20	37.239	38.396	38.848
19:25	37.080	38.210	38.643
19:30	36.923	38.026	38.439
19:35	36.766	37.842	38.236
19:40	36.608	37.659	38.034
19:45	36.452	37.477	37.833
19:50	36.297	37.295	37.632
19:55	36.142	37.114	37.433
20:00	35.987	36.934	37.235
20:05	35.833	36.755	37.038
20:10	35.680	36.576	36.842
20:15	35.527	36.399	36.646
20:20	35.374	36.222	36.452
20:25	35.223	36.045	36.258
20:30	35.071	35.870	36.066
20:35	34.921	35.695	35.874
20:40	34.770	35.521	35.684
20:45	34.621	35.347	35.494
20:50	34.472	35.174	35.305
20:55	34.323	35.002	35.117
21:00	34.175	34.831	34.930
21:05	34.028	34.661	34.744
21:10	33.881	34.491	34.559
21:15	33.734	34.322	34.375
21:20	33.588	34.153	34.192
21:25	33.443	33.986	34.009
21:30	33.298	33.819	33.828
21:35	33.153	33.653	33.647
21:40	33.010	33.487	33.468
21:45	32.866	33.322	33.289
21:50	32.723	33.158	33.111
21:55	32.581	32.995	32.934
22:00	32.439	32.832	32.758
22:05	32.298	32.670	32.583
22:10	32.157	32.509	32.409
22:15	32.017	32.348	32.235
22:20	31.877	32.188	32.063
22:25	31.738	32.028	31.891
22:30	31.599	31.870	31.720
22:35	31.460	31.713	31.550
22:40	31.323	31.555	31.381
22:45	31.185	31.399	31.213
22:50	31.048	31.243	31.045
22:55	30.912	31.088	30.879
23:00	30.776	30.934	30.713
23:05	30.641	30.780	30.548
23:10	30.506	30.627	30.384
23:15	30.372	30.475	30.221
23:20	30.238	30.323	30.059
23:25	30.104	30.172	29.898
23:30	29.971	30.022	29.737
23:35	29.839	29.872	29.577
23:40	29.707	29.723	29.418
23:45	29.575	29.575	29.260
23:50	29.444	29.427	29.103
23:55	29.314	29.280	28.946

Upper Tubo Hydrographs

Day 7

Time	100-Year	1000-Year	10000-Year
0:00	29.184	29.134	28.791
0:05	29.054	28.988	28.636
0:10	28.925	28.843	28.482
0:15	28.797	28.699	28.329
0:20	28.668	28.555	28.176
0:25	28.541	28.412	28.025
0:30	28.413	28.270	27.874
0:35	28.287	28.128	27.724
0:40	28.160	27.987	27.575
0:45	28.035	27.846	27.426
0:50	27.909	27.707	27.279
0:55	27.784	27.568	27.132
1:00	27.660	27.429	26.986
1:05	27.536	27.291	26.840
1:10	27.413	27.154	26.696
1:15	27.290	27.017	26.552
1:20	27.167	26.882	26.409
1:25	27.045	26.746	26.267
1:30	26.924	26.612	26.126
1:35	26.802	26.478	25.985
1:40	26.682	26.344	25.845
1:45	26.561	26.211	25.706
1:50	26.442	26.079	25.567
1:55	26.322	25.948	25.430
2:00	26.204	25.817	25.293
2:05	26.085	25.686	25.157
2:10	25.967	25.557	25.021
2:15	25.850	25.428	24.886
2:20	25.733	25.299	24.752
2:25	25.616	25.171	24.619
2:30	25.500	25.044	24.487
2:35	25.384	24.918	24.355
2:40	25.269	24.792	24.224
2:45	25.154	24.666	24.093
2:50	25.040	24.541	23.964
2:55	24.926	24.417	23.835
3:00	24.813	24.294	23.706
3:05	24.700	24.171	23.579
3:10	24.587	24.048	23.452
3:15	24.475	23.927	23.326
3:20	24.363	23.805	23.200
3:25	24.252	23.685	23.075
3:30	24.141	23.565	22.951
3:35	24.031	23.445	22.828
3:40	23.921	23.326	22.705
3:45	23.812	23.208	22.583
3:50	23.703	23.090	22.462
3:55	23.594	22.973	22.341
4:00	23.486	22.857	22.221
4:05	23.378	22.741	22.102
4:10	23.271	22.625	21.983
4:15	23.164	22.511	21.865
4:20	23.058	22.396	21.747
4:25	22.952	22.283	21.631
4:30	22.846	22.169	21.515
4:35	22.741	22.057	21.399
4:40	22.636	21.945	21.284
4:45	22.532	21.833	21.170
4:50	22.428	21.723	21.057
4:55	22.325	21.612	20.944
5:00	22.222	21.502	20.831
5:05	22.119	21.393	20.720
5:10	22.017	21.285	20.609
5:15	21.915	21.176	20.498
5:20	21.814	21.069	20.389
5:25	21.713	20.962	20.279
5:30	21.612	20.855	20.171
5:35	21.512	20.749	20.063
5:40	21.413	20.644	19.956
5:45	21.314	20.539	19.849
5:50	21.215	20.435	19.743
5:55	21.116	20.331	19.637
6:00	21.018	20.228	19.532
6:05	20.921	20.125	19.428
6:10	20.824	20.023	19.324
6:15	20.727	19.921	19.221
6:20	20.631	19.820	19.118
6:25	20.535	19.719	19.016
6:30	20.439	19.619	18.915
6:35	20.344	19.519	18.814
6:40	20.249	19.420	18.713
6:45	20.155	19.321	18.614
6:50	20.061	19.223	18.514
6:55	19.968	19.126	18.416
7:00	19.875	19.029	18.318
7:05	19.782	18.932	18.220
7:10	19.690	18.836	18.123
7:15	19.598	18.740	18.027
7:20	19.506	18.645	17.931
7:25	19.415	18.550	17.835
7:30	19.325	18.456	17.741
7:35	19.234	18.363	17.646
7:40	19.144	18.269	17.552
7:45	19.055	18.177	17.459
7:50	18.966	18.085	17.367
7:55	18.877	17.993	17.274
8:00	18.789	17.902	17.183
8:05	18.701	17.811	17.092
8:10	18.613	17.721	17.001
8:15	18.526	17.631	16.911
8:20	18.439	17.541	16.821
8:25	18.353	17.452	16.732
8:30	18.267	17.364	16.643
8:35	18.181	17.276	16.555
8:40	18.096	17.189	16.468
8:45	18.011	17.102	16.381
8:50	17.927	17.015	16.294
8:55	17.843	16.929	16.208
9:00	17.759	16.843	16.122
9:05	17.676	16.758	16.037
9:10	17.593	16.673	15.952
9:15	17.510	16.589	15.868
9:20	17.428	16.505	15.784
9:25	17.346	16.422	15.701
9:30	17.264	16.339	15.618
9:35	17.183	16.256	15.536
9:40	17.103	16.174	15.454
9:45	17.022	16.092	15.372
9:50	16.942	16.011	15.291
9:55	16.863	15.930	15.211
10:00	16.783	15.850	15.131
10:05	16.704	15.770	15.051
10:10	16.626	15.690	14.972
10:15	16.548	15.611	14.893
10:20	16.470	15.532	14.815
10:25	16.392	15.454	14.737
10:30	16.315	15.376	14.659
10:35	16.239	15.299	14.582
10:40	16.162	15.222	14.506
10:45	16.086	15.145	14.430
10:50	16.010	15.069	14.354
10:55	15.935	14.993	14.279
11:00	15.860	14.918	14.204
11:05	15.785	14.843	14.129
11:10	15.711	14.768	14.055
11:15	15.637	14.694	13.982
11:20	15.564	14.620	13.908
11:25	15.490	14.547	13.835
11:30	15.417	14.473	13.763
11:35	15.345	14.401	13.691
11:40	15.273	14.329	13.619
11:45	15.201	14.257	13.548
11:50	15.129	14.185	13.477
11:55	15.058	14.114	13.407

Upper Tubo Hydrographs

Day 7

Time	100-Year	1000-Year	10000-Year
12:00	14.987	14.043	13.336
12:05	14.917	13.973	13.267
12:10	14.846	13.903	13.197
12:15	14.777	13.833	13.128
12:20	14.707	13.764	13.060
12:25	14.638	13.695	12.992
12:30	14.569	13.627	12.924
12:35	14.500	13.558	12.856
12:40	14.432	13.491	12.789
12:45	14.364	13.423	12.722
12:50	14.297	13.356	12.656
12:55	14.230	13.289	12.590
13:00	14.163	13.223	12.524
13:05	14.096	13.157	12.459
13:10	14.030	13.091	12.394
13:15	13.964	13.026	12.329
13:20	13.898	12.961	12.265
13:25	13.833	12.897	12.201
13:30	13.768	12.832	12.137
13:35	13.703	12.768	12.074
13:40	13.639	12.705	12.011
13:45	13.575	12.641	11.948
13:50	13.511	12.579	11.886
13:55	13.447	12.516	11.824
14:00	13.384	12.454	11.762
14:05	13.321	12.392	11.701
14:10	13.259	12.330	11.640
14:15	13.197	12.269	11.579
14:20	13.135	12.208	11.519
14:25	13.073	12.147	11.459
14:30	13.012	12.087	11.399
14:35	12.951	12.027	11.340
14:40	12.890	11.967	11.281
14:45	12.830	11.908	11.222
14:50	12.769	11.849	11.163
14:55	12.710	11.790	11.105
15:00	12.650	11.732	11.047
15:05	12.591	11.674	10.990
15:10	12.532	11.616	10.932
15:15	12.473	11.558	10.875
15:20	12.415	11.501	10.818
15:25	12.356	11.444	10.762
15:30	12.299	11.388	10.706
15:35	12.241	11.331	10.650
15:40	12.184	11.275	10.594
15:45	12.127	11.219	10.539
15:50	12.070	11.164	10.484
15:55	12.014	11.109	10.429
16:00	11.958	11.054	10.374
16:05	11.902	10.999	10.320
16:10	11.846	10.945	10.266
16:15	11.791	10.891	10.212
16:20	11.736	10.837	10.159
16:25	11.681	10.784	10.105
16:30	11.626	10.731	10.052
16:35	11.572	10.678	10.000
16:40	11.518	10.625	9.947
16:45	11.464	10.573	9.895
16:50	11.411	10.521	9.843
16:55	11.358	10.469	9.791
17:00	11.305	10.417	9.740
17:05	11.252	10.366	9.688
17:10	11.200	10.315	9.637
17:15	11.148	10.264	9.586
17:20	11.096	10.214	9.536
17:25	11.044	10.163	9.485
17:30	10.993	10.113	9.435
17:35	10.942	10.064	9.385
17:40	10.891	10.014	9.336
17:45	10.840	9.965	9.286
17:50	10.790	9.916	9.237
17:55	10.740	9.867	9.188
18:00	10.690	9.819	9.139
18:05	10.640	9.770	9.091
18:10	10.591	9.722	9.042
18:15	10.542	9.675	8.994
18:20	10.493	9.627	8.946
18:25	10.444	9.580	8.898
18:30	10.396	9.533	8.851
18:35	10.348	9.486	8.803
18:40	10.300	9.439	8.756
18:45	10.252	9.393	8.709
18:50	10.205	9.347	8.662
18:55	10.157	9.301	8.616
19:00	10.110	9.255	8.569
19:05	10.064	9.209	8.523
19:10	10.017	9.164	8.477
19:15	9.971	9.119	8.431
19:20	9.925	9.074	8.385
19:25	9.879	9.030	8.340
19:30	9.833	8.985	8.294
19:35	9.788	8.941	8.249
19:40	9.743	8.897	8.204
19:45	9.698	8.854	8.159
19:50	9.653	8.810	8.115
19:55	9.609	8.767	8.070
20:00	9.564	8.724	8.026
20:05	9.520	8.681	7.982
20:10	9.476	8.638	7.938
20:15	9.433	8.595	7.894
20:20	9.389	8.553	7.850
20:25	9.346	8.511	7.806
20:30	9.303	8.469	7.763
20:35	9.260	8.427	7.719
20:40	9.218	8.386	7.676
20:45	9.175	8.345	7.633
20:50	9.133	8.303	7.590
20:55	9.091	8.262	7.547
21:00	9.050	8.222	7.505
21:05	9.008	8.181	7.462
21:10	8.967	8.141	7.420
21:15	8.926	8.100	7.378
21:20	8.885	8.060	7.336
21:25	8.844	8.021	7.293
21:30	8.804	7.981	7.251
21:35	8.763	7.941	7.209
21:40	8.723	7.902	7.168
21:45	8.683	7.863	7.126
21:50	8.643	7.824	7.085
21:55	8.604	7.785	7.043
22:00	8.565	7.746	7.002
22:05	8.525	7.708	6.961
22:10	8.486	7.670	6.919
22:15	8.448	7.632	6.878
22:20	8.409	7.594	6.837
22:25	8.371	7.556	6.796
22:30	8.332	7.518	6.756
22:35	8.294	7.481	6.715
22:40	8.257	7.443	6.674
22:45	8.219	7.406	6.634
22:50	8.181	7.369	6.593
22:55	8.144	7.332	6.553
23:00	8.107	7.295	6.512
23:05	8.070	7.259	6.472
23:10	8.033	7.222	6.431
23:15	7.997	7.186	6.391
23:20	7.960	7.150	6.351
23:25	7.924	7.114	6.311
23:30	7.888	7.078	6.271
23:35	7.852	7.042	6.230
23:40	7.816	7.007	6.190
23:45	7.781	6.971	6.150
23:50	7.745	6.936	6.110
23:55	7.710	6.901	6.070

Upper Tubo Hydrographs

Day 8

Time	100-Year	1000-Year	10000-Year
0:00	7.675	6.866	6.030
0:05	7.640	6.831	5.990
0:10	7.605	6.796	5.950
0:15	7.571	6.761	5.910
0:20	7.537	6.727	5.870
0:25	7.502	6.693	5.830
0:30	7.468	6.658	5.790
0:35	7.434	6.624	5.750
0:40	7.401	6.590	5.710
0:45	7.367	6.556	5.670
0:50	7.334	6.522	5.629
0:55	7.300	6.489	5.589
1:00	7.267	6.455	5.549
1:05	7.234	6.421	5.509
1:10	7.201	6.388	5.468
1:15	7.169	6.355	5.428
1:20	7.136	6.322	5.387
1:25	7.104	6.289	5.347
1:30	7.072	6.256	5.306
1:35	7.039	6.223	5.265
1:40	7.008	6.190	5.224
1:45	6.976	6.157	5.183
1:50	6.944	6.125	5.142
1:55	6.913	6.092	5.101
2:00	6.881	6.060	5.059
2:05	6.850	6.028	5.018
2:10	6.819	5.996	4.976
2:15	6.788	5.963	4.934
2:20	6.757	5.931	4.892
2:25	6.727	5.900	4.850
2:30	6.696	5.868	4.808
2:35	6.666	5.836	4.765
2:40	6.638	5.804	4.722
2:45	6.606	5.773	4.679
2:50	6.576	5.741	4.636
2:55	6.546	5.710	4.593
3:00	6.516	5.678	4.549
3:05	6.486	5.647	4.505
3:10	6.457	5.615	4.461
3:15	6.428	5.584	4.416
3:20	6.399	5.553	4.371
3:25	6.369	5.522	4.325
3:30	6.341	5.491	4.279
3:35	6.312	5.460	4.233
3:40	6.283	5.429	4.187
3:45	6.255	5.398	4.140
3:50	6.226	5.367	4.093
3:55	6.198	5.337	4.045
4:00	6.170	5.306	3.997
4:05	6.142	5.275	3.948
4:10	6.114	5.244	3.898
4:15	6.086	5.214	3.848
4:20	6.058	5.183	3.797
4:25	6.030	5.153	3.745
4:30	6.003	5.122	3.693
4:35	5.976	5.091	3.641
4:40	5.948	5.061	3.588
4:45	5.921	5.031	3.535
4:50	5.894	5.000	3.480
4:55	5.867	4.970	3.425
5:00	5.840	4.939	3.367
5:05	5.814	4.909	3.309
5:10	5.787	4.878	3.247
5:15	5.761	4.848	3.186
5:20	5.734	4.817	3.123
5:25	5.708	4.787	3.060
5:30	5.682	4.757	2.997
5:35	5.656	4.726	2.933
5:40	5.630	4.696	2.870
5:45	5.604	4.665	2.803
5:50	5.578	4.635	2.731
5:55	5.552	4.604	2.654
6:00	5.527	4.574	2.574
6:05	5.501	4.543	2.491
6:10	5.476	4.512	2.405
6:15	5.451	4.482	2.319
6:20	5.425	4.451	2.233
6:25	5.400	4.420	2.147
6:30	5.375	4.389	2.064
6:35	5.350	4.358	1.981
6:40	5.326	4.327	1.892
6:45	5.301	4.296	1.760
6:50	5.276	4.265	1.617
6:55	5.252	4.234	1.458
7:00	5.227	4.203	1.286
7:05	5.203	4.171	1.107
7:10	5.179	4.140	0.925
7:15	5.154	4.108	0.748
7:20	5.130	4.077	0.584
7:25	5.106	4.045	0.439
7:30	5.082	4.013	0.313
7:35	5.058	3.981	0.214
7:40	5.035	3.949	0.139
7:45	5.011	3.916	0.088
7:50	4.987	3.884	0.050
7:55	4.964	3.851	0.028
8:00	4.940	3.818	0.009
8:05	4.917	3.785	0.003
8:10	4.893	3.752	0.001
8:15	4.870	3.718	0.000
8:20	4.847	3.685	0.000
8:25	4.824	3.651	0.000
8:30	4.801	3.617	0.000
8:35	4.778	3.583	0.000
8:40	4.755	3.548	0.000
8:45	4.732	3.513	0.000
8:50	4.709	3.478	0.000
8:55	4.687	3.442	0.000
9:00	4.664	3.407	0.000
9:05	4.641	3.370	0.000
9:10	4.619	3.334	0.000
9:15	4.596	3.297	0.000
9:20	4.574	3.260	0.000
9:25	4.551	3.223	0.000
9:30	4.529	3.185	0.000
9:35	4.507	3.146	0.000
9:40	4.485	3.107	0.000
9:45	4.463	3.068	0.000
9:50	4.441	3.027	0.000
9:55	4.418	2.986	0.000
10:00	4.396	2.945	0.000
10:05	4.375	2.903	0.000
10:10	4.353	2.861	0.000
10:15	4.331	2.819	0.000
10:20	4.309	2.776	0.000
10:25	4.287	2.731	0.000
10:30	4.266	2.685	0.000
10:35	4.244	2.638	0.000
10:40	4.222	2.590	0.000
10:45	4.201	2.541	0.000
10:50	4.179	2.490	0.000
10:55	4.158	2.440	0.000
11:00	4.136	2.388	0.000
11:05	4.115	2.337	0.000
11:10	4.093	2.286	0.000
11:15	4.072	2.231	0.000
11:20	4.051	2.173	0.000
11:25	4.029	2.111	0.000
11:30	4.008	2.045	0.000
11:35	3.987	1.977	0.000
11:40	3.965	1.908	0.000
11:45	3.944	1.838	0.000
11:50	3.923	1.768	0.000
11:55	3.902	1.698	0.000

Upper Tubo Hydrographs

Day 8

Time	100-Year	1000-Year	10000-Year
12:00	3.881	1.630	0.000
12:05	3.859	1.559	0.000
12:10	3.838	1.470	0.000
12:15	3.817	1.362	0.000
12:20	3.796	1.238	0.000
12:25	3.775	1.102	0.000
12:30	3.754	0.958	0.000
12:35	3.733	0.810	0.000
12:40	3.712	0.663	0.000
12:45	3.691	0.525	0.000
12:50	3.669	0.399	0.000
12:55	3.648	0.290	0.000
13:00	3.627	0.202	0.000
13:05	3.606	0.133	0.000
13:10	3.585	0.083	0.000
13:15	3.564	0.050	0.000
13:20	3.543	0.029	0.000
13:25	3.521	0.015	0.000
13:30	3.500	0.005	0.000
13:35	3.479	0.002	0.000
13:40	3.458	0.001	0.000
13:45	3.437	0.000	0.000
13:50	3.415	0.000	0.000
13:55	3.394	0.000	0.000
14:00	3.373	0.000	0.000
14:05	3.351	0.000	0.000
14:10	3.330	0.000	0.000
14:15	3.308	0.000	0.000
14:20	3.287	0.000	0.000
14:25	3.265	0.000	0.000
14:30	3.244	0.000	0.000
14:35	3.222	0.000	0.000
14:40	3.200	0.000	0.000
14:45	3.178	0.000	0.000
14:50	3.156	0.000	0.000
14:55	3.134	0.000	0.000
15:00	3.112	0.000	0.000
15:05	3.090	0.000	0.000
15:10	3.068	0.000	0.000
15:15	3.046	0.000	0.000
15:20	3.023	0.000	0.000
15:25	3.001	0.000	0.000
15:30	2.978	0.000	0.000
15:35	2.956	0.000	0.000
15:40	2.933	0.000	0.000
15:45	2.910	0.000	0.000
15:50	2.887	0.000	0.000
15:55	2.864	0.000	0.000
16:00	2.840	0.000	0.000
16:05	2.817	0.000	0.000
16:10	2.793	0.000	0.000
16:15	2.769	0.000	0.000
16:20	2.745	0.000	0.000
16:25	2.721	0.000	0.000
16:30	2.697	0.000	0.000
16:35	2.672	0.000	0.000
16:40	2.647	0.000	0.000
16:45	2.623	0.000	0.000
16:50	2.597	0.000	0.000
16:55	2.572	0.000	0.000
17:00	2.546	0.000	0.000
17:05	2.520	0.000	0.000
17:10	2.494	0.000	0.000
17:15	2.467	0.000	0.000
17:20	2.441	0.000	0.000
17:25	2.414	0.000	0.000
17:30	2.386	0.000	0.000
17:35	2.359	0.000	0.000
17:40	2.331	0.000	0.000
17:45	2.302	0.000	0.000
17:50	2.273	0.000	0.000
17:55	2.243	0.000	0.000
18:00	2.213	0.000	0.000
18:05	2.183	0.000	0.000
18:10	2.152	0.000	0.000
18:15	2.121	0.000	0.000
18:20	2.089	0.000	0.000
18:25	2.057	0.000	0.000
18:30	2.024	0.000	0.000
18:35	1.990	0.000	0.000
18:40	1.955	0.000	0.000
18:45	1.919	0.000	0.000
18:50	1.882	0.000	0.000
18:55	1.845	0.000	0.000
19:00	1.806	0.000	0.000
19:05	1.768	0.000	0.000
19:10	1.729	0.000	0.000
19:15	1.690	0.000	0.000
19:20	1.648	0.000	0.000
19:25	1.603	0.000	0.000
19:30	1.555	0.000	0.000
19:35	1.505	0.000	0.000
19:40	1.453	0.000	0.000
19:45	1.400	0.000	0.000
19:50	1.347	0.000	0.000
19:55	1.293	0.000	0.000
20:00	1.241	0.000	0.000
20:05	1.187	0.000	0.000
20:10	1.122	0.000	0.000
20:15	1.044	0.000	0.000
20:20	0.952	0.000	0.000
20:25	0.850	0.000	0.000
20:30	0.741	0.000	0.000
20:35	0.628	0.000	0.000
20:40	0.515	0.000	0.000
20:45	0.408	0.000	0.000
20:50	0.311	0.000	0.000
20:55	0.227	0.000	0.000
21:00	0.158	0.000	0.000
21:05	0.104	0.000	0.000
21:10	0.066	0.000	0.000
21:15	0.039	0.000	0.000
21:20	0.021	0.000	0.000
21:25	0.007	0.000	0.000
21:30	0.002	0.000	0.000
21:35	0.001	0.000	0.000
21:40	0.000	0.000	0.000

1.2 Yola Buruku and New Yola Buruku hydrographs

Yola Hydrographs				
	Time	100-Year	1000-Year	10000-Year
Day 1	0:00	0.000	0.000	0.000
	0:05	0.000	0.000	0.001
	0:10	0.000	0.000	0.001
	0:15	0.000	0.000	0.002
	0:20	0.000	0.000	0.002
	0:25	0.000	0.000	0.003
	0:30	0.000	0.000	0.004
	0:35	0.000	0.000	0.005
	0:40	0.000	0.000	0.007
	0:45	0.000	0.000	0.009
	0:50	0.000	0.000	0.011
	0:55	0.000	0.000	0.014
	1:00	0.000	0.000	0.017
	1:05	0.000	0.000	0.020
	1:10	0.000	0.000	0.024
	1:15	0.000	0.000	0.028
	1:20	0.000	0.000	0.033
	1:25	0.000	0.000	0.039
	1:30	0.000	0.000	0.046
	1:35	0.000	0.000	0.053
	1:40	0.000	0.000	0.061
	1:45	0.000	0.000	0.069
	1:50	0.000	0.000	0.079
	1:55	0.000	0.000	0.089
	2:00	0.000	0.000	0.101
	2:05	0.000	0.000	0.114
	2:10	0.000	0.000	0.127
	2:15	0.000	0.000	0.142
	2:20	0.000	0.000	0.159
	2:25	0.000	0.000	0.177
	2:30	0.000	0.000	0.196
	2:35	0.000	0.000	0.216
	2:40	0.000	0.000	0.239
	2:45	0.000	0.000	0.263
	2:50	0.000	0.001	0.288
	2:55	0.000	0.001	0.316
	3:00	0.000	0.001	0.346
	3:05	0.000	0.002	0.377
	3:10	0.000	0.002	0.411
	3:15	0.000	0.003	0.446
	3:20	0.000	0.004	0.484
	3:25	0.000	0.005	0.525
	3:30	0.000	0.006	0.567
	3:35	0.000	0.008	0.612
	3:40	0.000	0.010	0.660
	3:45	0.000	0.012	0.709
	3:50	0.000	0.015	0.762
	3:55	0.000	0.018	0.817
	4:00	0.000	0.021	0.875
	4:05	0.000	0.025	0.935
	4:10	0.000	0.029	0.998
	4:15	0.000	0.034	1.064
	4:20	0.000	0.039	1.133
	4:25	0.000	0.045	1.204
	4:30	0.000	0.051	1.279
	4:35	0.000	0.058	1.356
	4:40	0.000	0.066	1.435
	4:45	0.000	0.075	1.518
	4:50	0.000	0.084	1.603
	4:55	0.000	0.094	1.692
	5:00	0.000	0.106	1.783
	5:05	0.000	0.118	1.876
	5:10	0.000	0.131	1.973
	5:15	0.000	0.145	2.073
	5:20	0.000	0.161	2.175
	5:25	0.000	0.178	2.280
	5:30	0.000	0.196	2.388
	5:35	0.000	0.215	2.499
	5:40	0.000	0.236	2.612
	5:45	0.000	0.258	2.729
	5:50	0.000	0.281	2.848
	5:55	0.000	0.307	2.970
	6:00	0.000	0.333	3.095
	6:05	0.000	0.362	3.223
	6:10	0.000	0.392	3.353
	6:15	0.000	0.424	3.487
	6:20	0.000	0.458	3.622
	6:25	0.000	0.493	3.761
	6:30	0.000	0.531	3.902
	6:35	0.000	0.570	4.046
	6:40	0.001	0.612	4.193
	6:45	0.001	0.655	4.342
	6:50	0.001	0.701	4.493
	6:55	0.002	0.749	4.647
	7:00	0.002	0.798	4.804
	7:05	0.003	0.850	4.963
	7:10	0.004	0.904	5.125
	7:15	0.005	0.960	5.289
	7:20	0.006	1.019	5.455
	7:25	0.007	1.079	5.624
	7:30	0.009	1.142	5.795
	7:35	0.011	1.207	5.968
	7:40	0.013	1.274	6.144
	7:45	0.015	1.344	6.322
	7:50	0.018	1.416	6.502
	7:55	0.021	1.489	6.684
	8:00	0.024	1.566	6.869
	8:05	0.028	1.644	7.055
	8:10	0.033	1.724	7.243
	8:15	0.037	1.807	7.434
	8:20	0.043	1.892	7.626
	8:25	0.048	1.979	7.821
	8:30	0.055	2.069	8.017
	8:35	0.062	2.160	8.215
	8:40	0.069	2.254	8.415
	8:45	0.078	2.350	8.617
	8:50	0.086	2.447	8.819
	8:55	0.096	2.546	9.022
	9:00	0.106	2.647	9.226
	9:05	0.117	2.749	9.430
	9:10	0.128	2.853	9.635
	9:15	0.141	2.958	9.841
	9:20	0.154	3.065	10.047
	9:25	0.167	3.172	10.252
	9:30	0.182	3.281	10.456
	9:35	0.197	3.390	10.659
	9:40	0.212	3.499	10.861
	9:45	0.229	3.609	11.062
	9:50	0.246	3.720	11.262
	9:55	0.264	3.831	11.461
	10:00	0.282	3.943	11.657
	10:05	0.302	4.054	11.852
	10:10	0.322	4.166	12.045
	10:15	0.343	4.278	12.236
	10:20	0.364	4.389	12.425
	10:25	0.387	4.501	12.612
	10:30	0.409	4.612	12.796
	10:35	0.433	4.722	12.977
	10:40	0.457	4.831	13.154
	10:45	0.482	4.940	13.328
	10:50	0.507	5.048	13.499
	10:55	0.533	5.154	13.666
	11:00	0.560	5.260	13.830
	11:05	0.586	5.364	13.989
	11:10	0.614	5.466	14.142
	11:15	0.641	5.565	14.291
	11:20	0.669	5.663	14.435
	11:25	0.697	5.759	14.574
	11:30	0.725	5.853	14.707
	11:35	0.754	5.943	14.835
	11:40	0.782	6.032	14.956
	11:45	0.811	6.117	15.071
	11:50	0.839	6.199	15.179
	11:55	0.867	6.278	15.281

Yola Hydrographs				
	Time	100-Year	1000-Year	10000-Year
Day 1	12:00	0.001	1.834	9.785
	12:05	0.001	1.878	9.922
	12:10	0.002	1.922	10.059
	12:15	0.002	1.967	10.196
	12:20	0.002	2.012	10.333
	12:25	0.003	2.057	10.469
	12:30	0.003	2.103	10.605
	12:35	0.003	2.149	10.740
	12:40	0.004	2.196	10.876
	12:45	0.004	2.243	11.011
	12:50	0.005	2.290	11.147
	12:55	0.005	2.338	11.282
	13:00	0.006	2.387	11.418
	13:05	0.007	2.436	11.554
	13:10	0.008	2.485	11.689
	13:15	0.008	2.535	11.825
	13:20	0.009	2.585	11.961
	13:25	0.010	2.636	12.097
	13:30	0.011	2.687	12.232
	13:35	0.012	2.738	12.368
	13:40	0.014	2.790	12.504
	13:45	0.015	2.842	12.639
	13:50	0.016	2.895	12.775
	13:55	0.018	2.948	12.912
	14:00	0.019	3.001	13.048
	14:05	0.021	3.056	13.185
	14:10	0.023	3.110	13.322
	14:15	0.025	3.165	13.460
	14:20	0.026	3.220	13.597
	14:25	0.029	3.276	13.735
	14:30	0.031	3.333	13.874
	14:35	0.033	3.389	14.012
	14:40	0.036	3.447	14.151
	14:45	0.038	3.504	14.290
	14:50	0.041	3.563	14.429
	14:55	0.044	3.621	14.569
	15:00	0.047	3.680	14.710
	15:05	0.050	3.740	14.851
	15:10	0.054	3.801	14.993
	15:15	0.057	3.861	15.135
	15:20	0.061	3.923	15.278
	15:25	0.065	3.985	15.422
	15:30	0.069	4.048	15.566
	15:35	0.074	4.111	15.711
	15:40	0.078	4.175	15.856
	15:45	0.083	4.239	16.002
	15:50	0.088	4.304	16.148
	15:55	0.093	4.369	16.295
	16:00	0.099	4.436	16.443
	16:05	0.104	4.502	16.592
	16:10	0.110	4.570	16.741
	16:15	0.116	4.638	16.890
	16:20	0.123	4.707	17.041
	16:25	0.130	4.776	17.191
	16:30	0.137	4.847	17.343
	16:35	0.144	4.917	17.495
	16:40	0.152	4.989	17.648
	16:45	0.160	5.061	17.801
	16:50	0.168	5.134	17.955
	16:55	0.177	5.208	18.110
	17:00	0.186	5.283	18.266
	17:05	0.195	5.359	18.423
	17:10	0.204	5.435	18.581
	17:15	0.215	5.512	18.739
	17:20	0.225	5.591	18.899
	17:25	0.236	5.670	19.061
	17:30	0.247	5.751	19.223
	17:35	0.259	5.832	19.387
	17:40	0.271	5.915	19.552
	17:45	0.283	5.998	19.718
	17:50	0.296	6.083	19.885
	17:55	0.310	6.168	20.054
	18:00	0.323	6.255	20.224
	18:05	0.338	6.343	20.396
	18:10	0.353	6.432	20.569
	18:15	0.368	6.522	20.743
	18:20	0.384	6.613	20.919
	18:25	0.400	6.705	21.096
	18:30	0.417	6.799	21.275
	18:35	0.434	6.894	21.455
	18:40	0.452	6.989	21.637
	18:45	0.471	7.086	21.821
	18:50	0.490	7.185	22.006
	18:55	0.510	7.284	22.193
	19:00	0.530	7.385	22.382
	19:05	0.551	7.487	22.572
	19:10	0.573	7.590	22.764
	19:15	0.595	7.694	22.958
	19:20	0.618	7.800	23.153
	19:25	0.642	7.907	23.350
	19:30	0.666	8.015	23.550
	19:35	0.691	8.124	23.751
	19:40	0.717	8.235	23.954
	19:45	0.744	8.347	24.159
	19:50	0.771	8.460	24.366
	19:55	0.799	8.575	24.575
	20:00	0.828	8.690	24.786
	20:05	0.857	8.808	25.000
	20:10	0.887	8.926	25.215
	20:15	0.918	9.046	25.433
	20:20	0.950	9.167	25.653
	20:25	0.983	9.290	25.875
	20:30	1.016	9.414	26.100
	20:35	1.050	9.540	26.328
	20:40	1.086	9.667	26.557
	20:45	1.122	9.796	26.790
	20:50	1.158	9.926	27.025
	20:55	1.196	10.057	27.262
	21:00	1.235	10.191	27.503
	21:05	1.274	10.325	27.746
	21:10	1.315	10.462	27.992
	21:15	1.356	10.600	28.241
	21:20	1.399	10.740	28.493
	21:25	1.442	10.882	28.748
	21:30	1.486	11.025	29.006
	21:35	1.532	11.170	29.267
	21:40	1.578	11.317	29.531
	21:45	1.625	11.466	29.799
	21:50	1.674	11.618	30.070
	21:55	1.723	11.771	30.345
	22:00	1.774	11.926	30.623
	22:05	1.826	12.083	30.905
	22:10	1.879	12.242	31.191
	22:15	1.933	12.404	31.479
	22:20	1.989	12.567	31.772
	22:25	2.045	12.733	32.068
	22:30	2.103	12.901	32.368
	22:35	2.162	13.072	32.671
	22:40	2.223	13.244	32.978
	22:45	2.284	13.420	33.290
	22:50	2.347	13.597	33.605
	22:55	2.412	13.777	33.924
	23:00	2.478	13.960	34.246
	23:05	2.545	14.145	34.573
	23:10	2.614	14.333	34.904
	23:15	2.684	14.523	35.239
	23:20	2.756	14.716	35.577
	23:25	2.829	14.911	35.919
	23:30	2.903	15.108	36.265
	23:35	2.979	15.308	36.614
	23:40	3.056	15.511	36.967
	23:45	3.135	15.717	37.324
	23:50	3.215	15.925	37.685
	23:55	3.297	16.135	38.050

Yola Hydrographs				
	Time	100-Year	1000-Year	10000-Year
Day 2	0:00	3.380	16.349	38.418
	0:05	3.466	16.565	38.791
	0:10	3.552	16.784	39.168
	0:15	3.641	17.006	39.549
	0:20	3.730	17.231	39.933
	0:25	3.822	17.458	40.321
	0:30	3.915	17.688	40.713
	0:35	4.010	17.921	41.109
	0:40	4.106	18.156	41.509
	0:45	4.204	18.395	41.913
	0:50	4.304	18.637	42.320
	0:55	4.405	18.881	42.732
	1:00	4.509	19.129	43.148
	1:05	4.614	19.380	43.569
	1:10	4.721	19.634	43.994
	1:15	4.830	19.891	44.423
	1:20	4.941	20.152	44.857
	1:25	5.054	20.415	45.295
	1:30	5.169	20.683	45.738
	1:35	5.285	20.954	46.185
	1:40	5.404	21.228	46.638
	1:45	5.525	21.506	47.095
	1:50	5.648	21.787	47.557
	1:55	5.774	22.073	48.025
	2:00	5.902	22.362	48.498
	2:05	6.032	22.656	48.976
	2:10	6.164	22.953	49.460
	2:15	6.301	23.259	49.956
	2:20	6.443	23.573	50.464
	2:25	6.589	23.896	50.986
	2:30	6.741	24.228	51.520
	2:35	6.898	24.569	52.067
	2:40	7.060	24.919	52.628
	2:45	7.228	25.280	53.203
	2:50	7.402	25.650	53.793
	2:55	7.582	26.032	54.398
	3:00	7.768	26.424	55.020
	3:05	7.961	26.828	55.658
	3:10	8.162	27.244	56.313
	3:15	8.369	27.673	56.987
	3:20	8.588	28.120	57.687
	3:25	8.817	28.586	58.416
	3:30	9.057	29.072	59.173
	3:35	9.310	29.578	59.961
	3:40	9.575	30.106	60.779
	3:45	9.854	30.657	61.631
	3:50	10.147	31.232	62.517
	3:55	10.455	31.832	63.440
	4:00	10.779	32.458	64.402
	4:05	11.119	33.113	65.403
	4:10	11.478	33.797	66.447
	4:15	11.861	34.521	67.547
	4:20	12.271	35.289	68.710
	4:25	12.710	36.103	69.939
	4:30	13.180	36.968	71.240
	4:35	13.684	37.887	72.618
	4:40	14.224	38.865	74.077
	4:45	14.811	39.915	75.638
	4:50	15.449	41.043	77.309
	4:55	16.142	42.259	79.099
	5:00	16.885	43.551	80.995
	5:05	17.689	44.937	83.020
	5:10	18.589	46.465	85.239
	5:15	19.704	48.312	87.884
	5:20	20.907	50.288	90.704
	5:25	22.187	52.379	93.681
	5:30	23.556	54.603	96.837
	5:35	25.014	56.959	100.170
	5:40	26.559	59.446	103.680
	5:45	28.187	62.054	107.357
	5:50	29.905	64.799	111.216
	5:55	31.718	67.684	115.266
	6:00	33.627	70.712	119.510
	6:05	35.628	73.877	123.937
	6:10	37.738	77.201	128.579
	6:15	40.006	80.759	133.533
	6:20	42.530	84.690	138.986
	6:25	45.180	88.804	144.682
	6:30	47.935	93.070	150.580
	6:35	50.802	97.500	156.696
	6:40	53.780	102.091	163.027
	6:45	56.864	106.835	169.562
	6:50	60.044	111.720	176.285
	6:55	63.321	116.748	183.197
	7:00	66.697	121.918	190.301
	7:05	70.170	127.230	197.593
	7:10	73.739	132.681	205.071
	7:15	77.411	138.283	212.749
	7:20	81.214	144.075	220.682
	7:25	85.167	150.085	228.904
	7:30	89.228	156.254	237.337
	7:35	93.387	162.564	245.959
	7:40	97.645	169.018	254.773
	7:45	102.002	175.617	263.780
	7:50	106.456	182.358	272.976
	7:55	111.008	189.240	282.361
	8:00	115.659	196.269	291.942
	8:05	120.415	203.450	301.726
	8:10	125.272	210.779	311.708
	8:15	130.227	218.250	321.879
	8:20	135.294	225.886	332.272
	8:25	140.542	233.785	343.014
	8:30	145.952	241.920	354.069
	8:35	151.498	250.251	365.384
	8:40	157.155	258.743	376.913
	8:45	162.925	267.395	388.653
	8:50	168.806	276.208	400.604
	8:55	174.793	285.173	412.756
	9:00	180.890	294.294	425.114
	9:05	187.096	303.574	437.681
	9:10	193.417	313.018	450.464
	9:15	199.847	322.617	463.451
	9:20	206.387	332.374	476.646
	9:25	213.064	342.327	490.101
	9:30	219.955	352.589	503.963
	9:35	227.002	363.074	518.119
	9:40	234.207	373.783	532.566
	9:45	241.527	384.654	547.223
	9:50	248.958	395.678	562.077
	9:55	256.496	406.851	577.124
	10:00	264.135	418.161	592.345
	10:05	271.871	429.607	607.740
	10:10	279.702	441.182	623.300
	10:15	287.626	452.886	639.024
	10:20	295.641	464.712	654.904
	10:25	303.751	476.669	670.950
	10:30	311.984	488.797	687.216
	10:35	320.350	501.109	703.718
	10:40	328.813	513.551	720.385
	10:45	337.390	526.149	737.246
	10:50	346.034	538.830	754.209
	10:55	354.736	551.583	771.254
	11:00	363.490	564.397	788.369
	11:05	372.281	577.253	805.526
	11:10	381.101	590.136	822.707
	11:15	389.940	603.033	839.894
	11:20	398.793	615.937	857.078
	11:25	407.649	628.832	874.239
	11:30	416.484	641.683	891.329
	11:35	425.239	654.406	908.238
	11:40	433.930	667.024	924.996
	11:45	442.564	679.547	941.618
	11:50	451.093	691.906	958.012
	11:55	459.563	704.168	974.265

Yola Hydrographs				
	Time	100-Year	1000-Year	10000-Year
Day 2	12:00	467.975	716.336	990.383
	12:05	476.326	728.402	1006.356
	12:10	484.607	740.356	1022.169
	12:15	492.815	752.192	1037.814
	12:20	500.948	763.906	1053.286
	12:25	509.006	775.500	1068.588
	12:30	516.970	786.948	1083.687
	12:35	524.810	798.204	1098.520
	12:40	532.415	809.108	1112.877
	12:45	539.893	819.819	1126.969
	12:50	547.241	830.333	1140.791
	12:55	554.372	840.523	1154.175
	13:00	561.363	850.504	1167.274
	13:05	568.230	860.297	1180.118
	13:10	574.973	869.904	1192.708
	13:15	581.588	879.317	1205.034
	13:20	588.074	888.535	1217.093
	13:25	594.433	897.564	1228.894
	13:30	600.667	906.403	1240.438
	13:35	606.755	915.024	1251.687
	13:40	612.654	923.363	1262.554
	13:45	618.301	931.332	1272.924
	13:50	623.795	939.074	1282.989
	13:55	629.128	946.577	1292.731
	14:00	634.224	953.731	1302.005
	14:05	639.136	960.615	1310.916
	14:10	643.895	967.273	1319.525
	14:15	648.502	973.706	1327.831
	14:20	652.952	979.907	1335.824
	14:25	657.244	985.875	1343.504
	14:30	661.386	991.623	1350.887
	14:35	665.380	997.151	1357.975
	14:40	669.208	1002.433	1364.732
	14:45	672.800	1007.370	1371.028
	14:50	676.171	1011.983	1376.890
	14:55	679.391	1016.374	1382.454
	15:00	682.448	1020.527	1387.702
	15:05	685.283	1024.356	1392.517
	15:10	687.924	1027.904	1396.958
	15:15	690.420	1031.241	1401.118
	15:20	692.775	1034.372	1405.006
	15:25	694.987	1037.298	1408.620
	15:30	697.061	1040.022	1411.965
	15:35	699.004	1042.556	1415.058
	15:40	700.824	1044.911	1417.913
	15:45	702.516	1047.080	1420.519
	15:50	704.046	1049.013	1422.811
	15:55	705.446	1050.755	1424.849
	16:00	706.732	1052.331	1426.663
	16:05	707.900	1053.734	1428.247
	16:10	708.932	1054.938	1429.565
	16:15	709.827	1055.942	1430.617
	16:20	710.607	1056.778	1431.444
	16:25	711.266	1057.436	1432.035
	16:30	711.801	1057.913	1432.389
	16:35	712.209	1058.204	1432.523
	16:40	712.501	1058.326	1432.543
	16:45	712.671	1058.269	1432.943
	16:50	712.683	1057.979	1436.947
	16:55	712.433	1057.310	1450.577
	17:00	712.051	1056.449	1477.031
	17:05	711.550	1055.416	1515.248
	17:10	710.911	1054.184	1562.371
	17:15	710.098	1052.700	1615.349
	17:20	709.087	1050.930	1671.617
	17:25	707.954	1048.988	1729.383
	17:30	706.708	1046.882	1787.236
	17:35	705.344	1044.609	1844.165
	17:40	703.867	1042.175	1899.495
	17:45	702.287	1039.593	1952.799
	17:50	700.609	1036.873	2003.823
	17:55	698.834	1034.012	2052.426
	18:00	696.954	1031.003	2098.555
	18:05	694.992	1027.878	2142.275
	18:10	692.954	1024.644	2183.664
	18:15	690.838	1021.305	2222.816
	18:20	688.645	1017.873	2259.852
	18:25	686.366	1014.370	2294.885
	18:30	684.017	1010.925	2328.076
	18:35	681.600	1007.894	2359.560
	18:40	679.114	1007.341	2389.467
	18:45	676.560	1015.082	2417.928
	18:50	673.942	1032.039	2445.068
	18:55	671.256	1056.622	2470.995
	19:00	668.488	1086.466	2495.783
	19:05	665.642	1119.448	2519.538
	19:10	662.732	1153.912	2542.371
	19:15	659.759	1188.637	2564.367
	19:20	656.723	1222.772	2585.591
	19:25	653.620	1255.746	2606.099
	19:30	650.436	1287.185	2625.917
	19:35	647.185	1316.910	2645.121
	19:40	643.868	1344.832	2663.764
	19:45	640.483	1370.933	2681.982
	19:50	637.034	1395.257	2701.151
	19:55	633.525	1417.884	2728.386
	20:00	629.947	1438.897	2769.798
	20:05	626.255	1458.341	2825.105
	20:10	622.489	1476.390	2890.322
	20:15	618.662	1493.179	2960.902
	20:20	614.776	1508.830	3033.193
	20:25	610.829	1523.460	3104.634
	20:30	606.816	1537.138	3173.567
	20:35	602.712	1549.957	3238.958
	20:40	598.542	1562.038	3300.335
	20:45	594.316	1573.479	3357.496
	20:50	590.038	1584.358	3410.430
	20:55	585.721	1594.753	3459.261
	21:00	581.380	1604.724	3504.172
	21:05	577.046	1614.312	3545.373
	21:10	572.778	1623.528	3583.060
	21:15	568.850	1632.483	3617.580
	21:20	566.044	1641.223	3649.193
	21:25	568.081	1649.782	3678.139
	21:30	575.676	1658.191	3704.647
	21:35	587.668	1666.473	3728.920
	21:40	602.458	1674.654	3751.113
	21:45	618.693	1683.107	3771.443
	21:50	635.358	1696.317	3790.104
	21:55	651.731	1722.803	3807.239
	22:00	667.348	1763.699	3822.984
	22:05	681.935	1814.425	3837.477
	22:10	695.373	1870.042	3850.891
	22:15	707.610	1926.863	3863.336
	22:20	718.619	1982.462	3874.844
	22:25	728.445	2035.437	3885.496
	22:30	737.161	2085.044	3895.370
	22:35	744.851	2130.965	3904.529
	22:40	751.616	2173.156	3913.044
	22:45	757.575	2211.757	3921.015
	22:50	762.824	2246.967	3928.484
	22:55	767.435	2279.007	3935.462
	23:00	771.498	2308.135	3941.977
	23:05	775.099	2334.625	3948.077
	23:10	778.329	2358.754	3953.817
	23:15	781.314	2380.840	3959.321
	23:20	784.082	2401.048	3964.539
	23:25	786.669	2419.546	3969.444
	23:30	789.134	2436.520	3974.059
	23:35	791.529	2452.136	3978.400
	23:40	793.897	2466.536	3982.477
	23:45	796.281	2479.853	3986.301
	23:50	798.743	2492.237	3989.931
	23:55	801.322	2503.803	3993.387

Yola Hydrographs

Day	Time	100-Year	1000-Year	10000-Year
Day 3	0:00	804.012	2514.587	3996.602
	0:05	806.832	2524.663	3999.570
	0:10	809.810	2534.110	4002.304
	0:15	812.968	2542.993	4004.806
	0:20	816.352	2551.396	4007.111
	0:25	820.031	2559.327	4009.163
	0:30	824.911	2566.827	4010.953
	0:35	838.830	2573.940	4012.484
	0:40	865.762	2580.703	4013.751
	0:45	902.079	2587.147	4014.749
	0:50	942.845	2593.301	4015.474
	0:55	984.544	2599.199	4015.931
	1:00	1025.074	2604.877	4016.133
	1:05	1063.281	2610.337	4016.049
	1:10	1098.635	2615.593	4015.668
	1:15	1130.979	2620.666	4014.992
	1:20	1160.376	2625.583	4014.035
	1:25	1187.008	2630.373	4012.813
	1:30	1211.081	2635.018	4011.284
	1:35	1232.847	2639.529	4009.447
	1:40	1252.557	2643.917	4007.306
	1:45	1270.448	2648.187	4004.857
	1:50	1286.740	2652.342	4002.097
	1:55	1301.631	2656.389	3999.029
	2:00	1315.306	2660.338	3995.665
	2:05	1327.933	2664.212	3992.035
	2:10	1339.631	2667.986	3988.107
	2:15	1350.513	2671.654	3983.877
	2:20	1360.686	2675.221	3979.359
	2:25	1370.257	2678.715	3974.594
	2:30	1379.292	2682.121	3969.574
	2:35	1387.837	2685.408	3964.267
	2:40	1395.947	2688.573	3958.679
	2:45	1403.669	2691.611	3952.819
	2:50	1411.041	2694.516	3946.689
	2:55	1418.093	2697.274	3940.287
	3:00	1424.853	2699.877	3933.618
	3:05	1431.351	2702.327	3926.698
	3:10	1437.629	2704.646	3919.572
	3:15	1443.684	2706.795	3912.204
	3:20	1449.528	2708.760	3904.589
	3:25	1455.175	2710.533	3896.735
	3:30	1460.638	2712.107	3888.644
	3:35	1465.929	2713.476	3880.324
	3:40	1471.057	2714.633	3871.779
	3:45	1476.035	2715.572	3863.017
	3:50	1480.872	2716.290	3854.043
	3:55	1485.579	2716.783	3844.865
	4:00	1490.163	2717.046	3835.487
	4:05	1494.635	2717.079	3825.920
	4:10	1499.003	2716.877	3816.168
	4:15	1503.276	2716.441	3806.238
	4:20	1507.462	2715.768	3796.134
	4:25	1511.569	2714.859	3785.866
	4:30	1515.610	2713.723	3775.450
	4:35	1519.605	2712.377	3764.915
	4:40	1523.545	2710.800	3754.238
	4:45	1527.435	2708.993	3743.420
	4:50	1531.284	2706.960	3732.473
	4:55	1535.096	2704.704	3721.402
	5:00	1538.877	2702.228	3710.211
	5:05	1542.627	2699.531	3698.902
	5:10	1546.351	2696.619	3687.480
	5:15	1550.054	2693.499	3675.958
	5:20	1553.746	2690.188	3664.354
	5:25	1557.424	2686.683	3652.665
	5:30	1561.081	2682.980	3640.883
	5:35	1564.715	2679.081	3629.010
	5:40	1568.326	2674.994	3617.053
	5:45	1571.911	2670.723	3605.016
	5:50	1575.467	2666.273	3592.903
	5:55	1578.990	2661.649	3580.717
	6:00	1582.475	2656.856	3568.463
	6:05	1585.918	2651.901	3556.144
	6:10	1589.312	2646.788	3543.765
	6:15	1592.652	2641.524	3531.330
	6:20	1595.934	2636.116	3518.847
	6:25	1599.149	2630.569	3506.316
	6:30	1602.291	2624.888	3493.742
	6:35	1605.359	2619.087	3481.139
	6:40	1608.362	2613.196	3468.544
	6:45	1611.283	2607.205	3455.940
	6:50	1614.106	2601.103	3443.309
	6:55	1616.822	2594.897	3430.654
	7:00	1619.427	2588.591	3417.980
	7:05	1621.914	2582.190	3405.290
	7:10	1624.276	2575.696	3392.584
	7:15	1626.507	2569.114	3379.861
	7:20	1628.600	2562.445	3367.124
	7:25	1630.554	2555.698	3354.381
	7:30	1632.373	2548.888	3341.647
	7:35	1634.059	2542.025	3328.934
	7:40	1635.591	2535.091	3316.215
	7:45	1636.968	2528.087	3303.488
	7:50	1638.187	2521.017	3290.757
	7:55	1639.247	2513.884	3278.023
	8:00	1640.146	2506.690	3265.286
	8:05	1640.883	2499.437	3252.547
	8:10	1641.458	2492.127	3239.806
	8:15	1641.870	2484.763	3227.065
	8:20	1642.122	2477.348	3214.327
	8:25	1642.216	2469.885	3201.593
	8:30	1642.152	2462.377	3188.865
	8:35	1641.932	2454.824	3176.143
	8:40	1641.560	2447.232	3163.431
	8:45	1641.043	2439.609	3150.741
	8:50	1640.391	2431.967	3138.084
	8:55	1639.596	2424.293	3125.443
	9:00	1638.660	2416.587	3112.817
	9:05	1637.587	2408.853	3100.209
	9:10	1636.382	2401.092	3087.619
	9:15	1635.047	2393.306	3075.050
	9:20	1633.585	2385.496	3062.501
	9:25	1632.001	2377.665	3049.974
	9:30	1630.299	2369.814	3037.471
	9:35	1628.483	2361.946	3024.994
	9:40	1626.559	2354.066	3012.548
	9:45	1624.538	2346.185	3000.149
	9:50	1622.413	2338.292	2987.778
	9:55	1620.188	2330.385	2975.435
	10:00	1617.867	2322.469	2963.122
	10:05	1615.454	2314.544	2950.842
	10:10	1612.953	2306.612	2938.594
	10:15	1610.364	2298.672	2926.378
	10:20	1607.694	2290.727	2914.196
	10:25	1604.944	2282.778	2902.049
	10:30	1602.119	2274.828	2889.939
	10:35	1599.222	2266.877	2877.867
	10:40	1596.256	2258.927	2865.834
	10:45	1593.224	2250.978	2853.840
	10:50	1590.131	2243.036	2841.892
	10:55	1586.989	2235.114	2830.005
	11:00	1583.792	2227.203	2818.169
	11:05	1580.543	2219.300	2806.377
	11:10	1577.242	2211.407	2794.633
	11:15	1573.894	2203.525	2782.937
	11:20	1570.500	2195.656	2771.289
	11:25	1567.062	2187.799	2759.690
	11:30	1563.583	2179.956	2748.141
	11:35	1560.064	2172.127	2736.641
	11:40	1556.507	2164.313	2725.191
	11:45	1552.915	2156.515	2713.790
	11:50	1549.288	2148.733	2702.442
	11:55	1545.635	2140.977	2691.155

Yola Hydrographs

Day	Time	100-Year	1000-Year	10000-Year
Day 3	12:00	1541.954	2133.241	2679.923
	12:05	1538.243	2125.523	2668.742
	12:10	1534.505	2117.825	2657.614
	12:15	1530.742	2110.147	2646.538
	12:20	1526.955	2102.490	2635.516
	12:25	1523.145	2094.854	2624.546
	12:30	1519.315	2087.240	2613.631
	12:35	1515.465	2079.650	2602.771
	12:40	1511.597	2072.082	2591.964
	12:45	1507.710	2064.538	2581.211
	12:50	1503.807	2057.017	2570.511
	12:55	1499.889	2049.519	2559.866
	13:00	1495.961	2042.053	2549.282
	13:05	1492.026	2034.621	2538.765
	13:10	1488.079	2027.214	2528.304
	13:15	1484.122	2019.834	2517.897
	13:20	1480.155	2012.481	2507.545
	13:25	1476.180	2005.155	2497.250
	13:30	1472.197	1997.857	2487.010
	13:35	1468.208	1990.587	2476.826
	13:40	1464.212	1983.345	2466.697
	13:45	1460.211	1976.130	2456.623
	13:50	1456.204	1968.943	2446.602
	13:55	1452.193	1961.783	2436.636
	14:00	1448.177	1954.651	2426.722
	14:05	1444.161	1947.551	2416.868
	14:10	1440.146	1940.485	2407.075
	14:15	1436.128	1933.446	2397.336
	14:20	1432.109	1926.436	2387.649
	14:25	1428.089	1919.454	2378.016
	14:30	1424.069	1912.502	2368.436
	14:35	1420.049	1905.577	2358.909
	14:40	1416.030	1898.682	2349.436
	14:45	1412.011	1891.815	2340.015
	14:50	1407.994	1884.976	2330.645
	14:55	1403.977	1878.165	2321.327
	15:00	1399.961	1871.381	2312.059
	15:05	1395.948	1864.626	2302.843
	15:10	1391.942	1857.905	2293.687
	15:15	1387.938	1851.213	2284.582
	15:20	1383.937	1844.547	2275.526
	15:25	1379.939	1837.910	2266.520
	15:30	1375.945	1831.300	2257.565
	15:35	1371.954	1824.718	2248.659
	15:40	1367.967	1818.164	2239.804
	15:45	1363.985	1811.637	2230.998
	15:50	1360.007	1805.138	2222.241
	15:55	1356.034	1798.667	2213.534
	16:00	1352.066	1792.223	2204.876
	16:05	1348.102	1785.807	2196.266
	16:10	1344.144	1779.417	2187.705
	16:15	1340.192	1773.056	2179.194
	16:20	1336.249	1766.728	2170.738
	16:25	1332.312	1760.427	2162.332
	16:30	1328.382	1754.155	2153.975
	16:35	1324.458	1747.910	2145.667
	16:40	1320.541	1741.693	2137.408
	16:45	1316.631	1735.505	2129.198
	16:50	1312.729	1729.344	2121.037
	16:55	1308.832	1723.211	2112.924
	17:00	1304.943	1717.104	2104.857
	17:05	1301.060	1711.024	2096.838
	17:10	1297.184	1704.971	2088.866
	17:15	1293.317	1698.948	2080.946
	17:20	1289.458	1692.954	2073.075
	17:25	1285.607	1686.986	2065.250
	17:30	1281.761	1681.044	2057.470
	17:35	1277.923	1675.128	2049.736
	17:40	1274.092	1669.238	2042.048
	17:45	1270.268	1663.374	2034.405
	17:50	1266.451	1657.536	2026.808
	17:55	1262.641	1651.724	2019.255
	18:00	1258.838	1645.938	2011.748
	18:05	1255.044	1640.178	2004.285
	18:10	1251.256	1634.444	1996.868
	18:15	1247.476	1628.737	1989.495
	18:20	1243.704	1623.055	1982.167
	18:25	1239.940	1617.399	1974.884
	18:30	1236.196	1611.774	1967.651
	18:35	1232.442	1606.176	1960.464
	18:40	1228.706	1600.605	1953.323
	18:45	1224.979	1595.061	1946.226
	18:50	1221.260	1589.544	1939.174
	18:55	1217.551	1584.054	1932.167
	19:00	1213.851	1578.590	1925.205
	19:05	1210.159	1573.154	1918.288
	19:10	1206.477	1567.744	1911.414
	19:15	1202.804	1562.362	1904.585
	19:20	1199.141	1557.007	1897.802
	19:25	1195.490	1551.683	1891.068
	19:30	1191.849	1546.386	1884.377
	19:35	1188.217	1541.116	1877.730
	19:40	1184.595	1535.873	1871.126
	19:45	1180.983	1530.657	1864.566
	19:50	1177.381	1525.467	1858.048
	19:55	1173.789	1520.305	1851.574
	20:00	1170.207	1515.170	1845.142
	20:05	1166.635	1510.060	1838.752
	20:10	1163.072	1504.978	1832.403
	20:15	1159.520	1499.921	1826.097
	20:20	1155.978	1494.891	1819.831
	20:25	1152.445	1489.888	1813.606
	20:30	1148.923	1484.910	1807.422
	20:35	1145.412	1479.959	1801.279
	20:40	1141.912	1475.036	1795.179
	20:45	1138.424	1470.141	1789.121
	20:50	1134.947	1465.272	1783.104
	20:55	1131.481	1460.430	1777.127
	21:00	1128.025	1455.614	1771.190
	21:05	1124.582	1450.826	1765.293
	21:10	1121.149	1446.063	1759.435
	21:15	1117.727	1441.326	1753.616
	21:20	1114.317	1436.615	1747.835
	21:25	1110.918	1431.931	1742.094
	21:30	1107.533	1427.275	1736.394
	21:35	1104.160	1422.647	1730.735
	21:40	1100.799	1418.044	1725.114
	21:45	1097.449	1413.467	1719.528
	21:50	1094.111	1408.915	1713.980
	21:55	1090.784	1404.388	1708.467
	22:00	1087.469	1399.886	1702.991
	22:05	1084.165	1395.408	1697.550
	22:10	1080.873	1390.956	1692.145
	22:15	1077.594	1386.529	1686.776
	22:20	1074.327	1382.128	1681.442
	22:25	1071.072	1377.751	1676.144
	22:30	1067.830	1373.400	1670.881
	22:35	1064.600	1369.074	1665.653
	22:40	1061.383	1364.772	1660.459
	22:45	1058.179	1360.496	1655.301
	22:50	1054.989	1356.246	1650.179
	22:55	1051.815	1352.024	1645.095
	23:00	1048.653	1347.828	1640.046
	23:05	1045.506	1343.657	1635.031
	23:10	1042.372	1339.511	1630.051
	23:15	1039.252	1335.391	1625.106
	23:20	1036.147	1331.298	1620.196
	23:25	1033.057	1327.230	1615.321
	23:30	1029.982	1323.188	1610.480
	23:35	1026.922	1319.173	1605.676
	23:40	1023.878	1315.186	1600.909
	23:45	1020.850	1311.225	1596.176
	23:50	1017.836	1307.289	1591.476
	23:55	1014.837	1303.379	1586.811

Yola Hydrographs

Day	Time	100-Year	1000-Year	10000-Year
Day 4	0:00	1011.854	1299.494	1582.178
	0:05	1008.886	1295.634	1577.579
	0:10	1005.932	1291.799	1573.013
	0:15	1002.994	1287.989	1568.479
	0:20	1000.071	1284.204	1563.977
	0:25	997.163	1280.443	1559.507
	0:30	994.271	1276.707	1555.069
	0:35	991.393	1272.995	1550.663
	0:40	988.530	1269.307	1546.287
	0:45	985.682	1265.643	1541.943
	0:50	982.850	1262.002	1537.629
	0:55	980.032	1258.385	1533.345
	1:00	977.229	1254.792	1529.092
	1:05	974.443	1251.225	1524.872
	1:10	971.672	1247.681	1520.682
	1:15	968.917	1244.160	1516.522
	1:20	966.176	1240.662	1512.392
	1:25	963.451	1237.188	1508.290
	1:30	960.740	1233.736	1504.219
	1:35	958.045	1230.307	1500.175
	1:40	955.364	1226.900	1496.160
	1:45	952.699	1223.515	1492.173
	1:50	950.047	1220.152	1488.214
	1:55	947.411	1216.811	1484.282
	2:00	944.789	1213.491	1480.378
	2:05	942.181	1210.192	1476.500
	2:10	939.587	1206.915	1472.648
	2:15	937.008	1203.658	1468.824
	2:20	934.443	1200.423	1465.025
	2:25	931.893	1197.208	1461.252
	2:30	929.356	1194.013	1457.506
	2:35	926.834	1190.840	1453.785
	2:40	924.326	1187.687	1450.090
	2:45	921.832	1184.554	1446.421
	2:50	919.353	1181.441	1442.776
	2:55	916.887	1178.348	1439.156
	3:00	914.434	1175.275	1435.561
	3:05	911.996	1172.221	1431.990
	3:10	909.571	1169.187	1428.443
	3:15	907.160	1166.173	1424.921
	3:20	904.763	1163.177	1421.423
	3:25	902.379	1160.201	1417.949
	3:30	900.009	1157.245	1414.498
	3:35	897.653	1154.307	1411.071
	3:40	895.310	1151.387	1407.667
	3:45	892.980	1148.487	1404.286
	3:50	890.663	1145.604	1400.928
	3:55	888.359	1142.741	1397.592
	4:00	886.069	1139.895	1394.279
	4:05	883.791	1137.067	1390.988
	4:10	881.527	1134.257	1387.719
	4:15	879.275	1131.465	1384.471
	4:20	877.035	1128.690	1381.245
	4:25	874.808	1125.932	1378.041
	4:30	872.594	1123.192	1374.857
	4:35	870.393	1120.469	1371.695
	4:40	868.204	1117.764	1368.554
	4:45	866.027	1115.075	1365.435
	4:50	863.863	1112.404	1362.336
	4:55	861.711	1109.749	1359.258
	5:00	859.572	1107.112	1356.201
	5:05	857.446	1104.492	1353.165
	5:10	855.331	1101.888	1350.149
	5:15	853.227	1099.298	1347.150
	5:20	851.133	1096.723	1344.169
	5:25	849.050	1094.162	1341.205
	5:30	846.977	1091.614	1338.258
	5:35	844.915	1089.081	1335.328
	5:40	842.863	1086.562	1332.415
	5:45	840.821	1084.056	1329.518
	5:50	838.789	1081.564	1326.638
	5:55	836.767	1079.085	1323.774
	6:00	834.754	1076.619	1320.926
	6:05	832.752	1074.167	1318.095
	6:10	830.759	1071.727	1315.279
	6:15	828.776	1069.300	1312.478
	6:20	826.800	1066.884	1309.690
	6:25	824.832	1064.477	1306.914
	6:30	822.871	1062.081	1304.150
	6:35	820.919	1059.695	1301.399
	6:40	818.973	1057.319	1298.660
	6:45	817.036	1054.953	1295.933
	6:50	815.105	1052.597	1293.219
	6:55	813.183	1050.251	1290.516
	7:00	811.267	1047.915	1287.825
	7:05	809.359	1045.588	1285.145
	7:10	807.457	1043.270	1282.477
	7:15	805.563	1040.962	1279.821
	7:20	803.675	1038.663	1277.175
	7:25	801.794	1036.372	1274.539
	7:30	799.918	1034.089	1271.913
	7:35	798.049	1031.813	1269.296
	7:40	796.185	1029.546	1266.689
	7:45	794.328	1027.286	1264.091
	7:50	792.476	1025.034	1261.503
	7:55	790.629	1022.790	1258.924
	8:00	788.788	1020.553	1256.354
	8:05	786.953	1018.324	1253.793
	8:10	785.124	1016.102	1251.242
	8:15	783.300	1013.887	1248.699
	8:20	781.481	1011.679	1246.164
	8:25	779.666	1009.478	1243.638
	8:30	777.856	1007.282	1241.118
	8:35	776.050	1005.091	1238.604
	8:40	774.247	1002.905	1236.096
	8:45	772.449	1000.725	1233.594
	8:50	770.653	998.549	1231.098
	8:55	768.862	996.378	1228.608
	9:00	767.074	994.212	1226.124
	9:05	765.290	992.051	1223.646
	9:10	763.510	989.896	1221.174
	9:15	761.733	987.745	1218.708
	9:20	759.960	985.599	1216.248
	9:25	758.190	983.458	1213.793
	9:30	756.423	981.320	1211.343
	9:35	754.658	979.186	1208.895
	9:40	752.895	977.054	1206.451
	9:45	751.133	974.924	1204.009
	9:50	749.374	972.797	1201.570
	9:55	747.616	970.673	1199.133
	10:00	745.860	968.551	1196.699
	10:05	744.106	966.432	1194.268
	10:10	742.355	964.317	1191.841
	10:15	740.608	962.208	1189.421
	10:20	738.863	960.102	1187.004
	10:25	737.120	957.999	1184.590
	10:30	735.379	955.897	1182.177
	10:35	733.639	953.797	1179.764
	10:40	731.900	951.698	1177.352
	10:45	730.160	949.599	1174.938
	10:50	728.421	947.500	1172.522
	10:55	726.681	945.400	1170.105
	11:00	724.941	943.300	1167.685
	11:05	723.202	941.200	1165.264
	11:10	721.462	939.099	1162.840
	11:15	719.722	936.997	1160.413
	11:20	717.981	934.894	1157.983
	11:25	716.240	932.790	1155.550
	11:30	714.498	930.685	1153.113
	11:35	712.757	928.580	1150.673
	11:40	711.015	926.474	1148.231
	11:45	709.275	924.368	1145.787
	11:50	707.534	922.263	1143.340
	11:55	705.795	920.158	1140.891

Yola Hydrographs

Day	Time	100-Year	1000-Year	10000-Year
Day 4	12:00	704.058	918.055	1138.442
	12:05	702.323	915.954	1135.994
	12:10	700.588	913.853	1133.542
	12:15	698.855	911.751	1131.087
	12:20	697.122	909.650	1128.629
	12:25	695.389	907.548	1126.167
	12:30	693.657	905.445	1123.700
	12:35	691.924	903.340	1121.229
	12:40	690.193	901.236	1118.754
	12:45	688.464	899.132	1116.276
	12:50	686.735	897.028	1113.794
	12:55	685.009	894.925	1111.310
	13:00	683.284	892.822	1108.823
	13:05	681.561	890.720	1106.333
	13:10	679.840	888.618	1103.839
	13:15	678.120	886.516	1101.341
	13:20	676.401	884.414	1098.838
	13:25	674.684	882.310	1096.331
	13:30	672.967	880.206	1093.818
	13:35	671.251	878.101	1091.300
	13:40	669.537	875.995	1088.776
	13:45	667.824	873.889	1086.249
	13:50	666.114	871.783	1083.717
	13:55	664.405	869.676	1081.180
	14:00	662.698	867.571	1078.640
	14:05	660.994	865.466	1076.097
	14:10	659.293	863.361	1073.550
	14:15	657.594	861.257	1070.999
	14:20	655.897	859.153	1068.444
	14:25	654.202	857.049	1065.884
	14:30	652.509	854.944	1063.320
	14:35	650.818	852.839	1060.750
	14:40	649.129	850.733	1058.176
	14:45	647.442	848.626	1055.596
	14:50	645.757	846.521	1053.014
	14:55	644.076	844.416	1050.427
	15:00	642.397	842.311	1047.837
	15:05	640.721	840.207	1045.244
	15:10	639.048	838.104	1042.648
	15:15	637.378	836.002	1040.049
	15:20	635.711	833.901	1037.447
	15:25	634.048	831.800	1034.841
	15:30	632.387	829.700	1032.232
	15:35	630.728	827.600	1029.620
	15:40	629.073	825.501	1027.004
	15:45	627.419	823.401	1024.384
	15:50	625.769	821.302	1021.761
	15:55	624.121	819.203	1019.134
	16:00	622.476	817.105	1016.504
	16:05	620.834	815.007	1013.871
	16:10	619.194	812.909	1011.235
	16:15	617.558	810.811	1008.595
	16:20	615.923	808.715	1005.953
	16:25	614.292	806.618	1003.307
	16:30	612.663	804.522	1000.659
	16:35	611.037	802.426	998.007
	16:40	609.413	800.330	995.351
	16:45	607.792	798.233	992.693
	16:50	606.172	796.137	990.031
	16:55	604.557	794.043	987.368
	17:00	602.945	791.950	984.704
	17:05	601.337	789.859	982.039
	17:10	599.732	787.770	979.373
	17:15	598.130	785.682	976.706
	17:20	596.533	783.597	974.039
	17:25	594.941	781.515	971.373
	17:30	593.353	779.435	968.707
	17:35	591.768	777.358	966.042
	17:40	590.188	775.284	963.377
	17:45	588.613	773.212	960.712
	17:50	587.041	771.143	958.048
	17:55	585.473	769.076	955.384
	18:00	583.910	767.013	952.722
	18:05	582.351	764.952	950.059
	18:10	580.796	762.893	947.398
	18:15	579.246	760.838	944.738
	18:20	577.699	758.785	942.078
	18:25	576.157	756.735	939.420
	18:30	574.620	754.688	936.762
	18:35	573.086	752.644	934.106
	18:40	571.557	750.603	931.451
	18:45	570.033	748.565	928.798
	18:50	568.512	746.530	926.145
	18:55	566.996	744.497	923.494
	19:00	565.484	742.468	920.844
	19:05	563.977	740.442	918.196
	19:10	562.474	738.419	915.550
	19:15	560.976	736.399	912.905
	19:20	559.482	734.382	910.262
	19:25	557.993	732.369	907.621
	19:30	556.508	730.359	904.982
	19:35	555.028	728.352	902.345
	19:40	553.552	726.349	899.710
	19:45	552.081	724.349	897.077
	19:50	550.615	722.352	894.446
	19:55	549.153	720.358	891.818
	20:00	547.696	718.368	889.192
	20:05	546.244	716.382	886.568
	20:10	544.797	714.400	883.948
	20:15	543.355	712.422	881.331
	20:20	541.917	710.447	878.717
	20:25	540.485	708.477	876.107
	20:30	539.058	706.511	873.499
	20:35	537.636	704.549	870.896
	20:40	536.220	702.591	868.296
	20:45	534.808	700.638	865.700
	20:50	533.402	698.689	863.108
	20:55	532.001	696.745	860.520
	21:00	530.606	694.805	857.936
	21:05	529.216	692.869	855.356
	21:10	527.831	690.938	852.781
	21:15	526.452	689.013	850.211
	21:20	525.079	687.092	847.646
	21:25	523.711	685.177	845.086
	21:30	522.349	683.266	842.531
	21:35	520.993	681.361	839.981
	21:40	519.642	679.461	837.437
	21:45	518.297	677.566	834.899
	21:50	516.958	675.677	832.366
	21:55	515.625	673.793	829.839
	22:00	514.298	671.915	827.319
	22:05	512.976	670.042	824.804
	22:10	511.660	668.174	822.294
	22:15	510.349	666.311	819.790
	22:20	509.043	664.452	817.291
	22:25	507.742	662.598	814.797
	22:30	506.446	660.749	812.308
	22:35	505.154	658.904	809.824
	22:40	503.868	657.064	807.345
	22:45	502.586	655.228	804.872
	22:50	501.309	653.396	802.403
	22:55	500.036	651.568	799.938
	23:00	498.767	649.744	797.479
	23:05	497.503	647.924	795.024
	23:10	496.243	646.109	792.575
	23:15	494.987	644.296	790.129
	23:20	493.733	642.487	787.686
	23:25	492.484	640.680	785.248
	23:30	491.237	638.876	782.813
	23:35	489.994	637.075	780.382
	23:40	488.754	635.278	777.954
	23:45	487.517	633.483	775.531
	23:50	486.283	631.691	773.111
	23:55	485.051	629.901	770.694

Yola Hydrographs				
	Time	100-Year	1000-Year	10000-Year
Day 5	0:00	493.922	629.114	768.281
	0:05	482.596	626.328	765.670
	0:10	481.372	624.546	763.463
	0:15	480.150	622.765	761.059
	0:20	478.931	620.987	758.659
	0:25	477.714	619.210	756.261
	0:30	476.498	617.436	753.868
	0:35	475.285	615.663	751.475
	0:40	474.074	613.893	749.087
	0:45	472.865	612.125	746.702
	0:50	471.658	610.359	744.321
	0:55	470.452	608.595	741.943
	1:00	469.249	606.833	739.568
	1:05	468.047	605.074	737.197
	1:10	466.847	603.316	734.830
	1:15	465.649	601.561	732.466
	1:20	464.453	599.807	730.105
	1:25	463.259	598.056	727.748
	1:30	462.065	596.307	725.394
	1:35	460.873	594.559	723.044
	1:40	459.682	592.813	720.697
	1:45	458.493	591.070	718.354
	1:50	457.306	589.329	716.015
	1:55	456.120	587.590	713.679
	2:00	454.936	585.853	711.348
	2:05	453.752	584.118	709.020
	2:10	452.571	582.385	706.696
	2:15	451.390	580.654	704.376
	2:20	450.211	578.926	702.059
	2:25	449.033	577.199	699.747
	2:30	447.856	575.475	697.439
	2:35	446.680	573.752	695.132
	2:40	445.505	572.031	692.830
	2:45	444.331	570.312	690.532
	2:50	443.158	568.595	688.239
	2:55	441.986	566.880	685.948
	3:00	440.815	565.167	683.662
	3:05	439.645	563.457	681.380
	3:10	438.477	561.748	679.101
	3:15	437.309	560.042	676.827
	3:20	436.142	558.338	674.556
	3:25	434.976	556.635	672.290
	3:30	433.811	554.935	670.027
	3:35	432.647	553.237	667.769
	3:40	431.484	551.542	665.515
	3:45	430.322	549.848	663.266
	3:50	429.161	548.158	661.020
	3:55	428.002	546.469	658.780
	4:00	426.843	544.784	656.544
	4:05	425.686	543.100	654.312
	4:10	424.530	541.420	652.085
	4:15	423.375	539.742	649.863
	4:20	422.221	538.067	647.646
	4:25	421.069	536.395	645.434
	4:30	419.918	534.726	643.227
	4:35	418.769	533.060	641.025
	4:40	417.620	531.396	638.827
	4:45	416.473	529.735	636.635
	4:50	415.327	528.077	634.447
	4:55	414.182	526.422	632.265
	5:00	413.039	524.770	630.087
	5:05	411.898	523.121	627.915
	5:10	410.757	521.475	625.748
	5:15	409.618	519.833	623.587
	5:20	408.481	518.193	621.430
	5:25	407.345	516.557	619.279
	5:30	406.211	514.924	617.133
	5:35	405.078	513.294	614.993
	5:40	403.946	511.667	612.858
	5:45	402.817	510.044	610.728
	5:50	401.688	508.424	608.604
	5:55	400.562	506.808	606.485
	6:00	399.437	505.195	604.372
	6:05	398.314	503.585	602.265
	6:10	397.192	501.979	600.163
	6:15	396.073	500.377	598.067
	6:20	394.955	498.778	595.977
	6:25	393.839	497.183	593.893
	6:30	392.725	495.592	591.815
	6:35	391.613	494.005	589.742
	6:40	390.503	492.421	587.676
	6:45	389.394	490.841	585.614
	6:50	388.287	489.264	583.559
	6:55	387.182	487.691	581.509
	7:00	386.079	486.122	579.465
	7:05	384.978	484.556	577.426
	7:10	383.878	482.994	575.393
	7:15	382.781	481.436	573.366
	7:20	381.685	479.881	571.345
	7:25	380.592	478.330	569.330
	7:30	379.500	476.783	567.320
	7:35	378.410	475.240	565.316
	7:40	377.322	473.701	563.318
	7:45	376.236	472.165	561.325
	7:50	375.152	470.633	559.338
	7:55	374.070	469.104	557.357
	8:00	372.990	467.579	555.382
	8:05	371.912	466.059	553.412
	8:10	370.836	464.542	551.448
	8:15	369.762	463.029	549.489
	8:20	368.691	461.520	547.537
	8:25	367.621	460.014	545.590
	8:30	366.554	458.513	543.649
	8:35	365.488	457.016	541.714
	8:40	364.426	455.523	539.785
	8:45	363.365	454.033	537.862
	8:50	362.306	452.548	535.945
	8:55	361.250	451.066	534.033
	9:00	360.196	449.589	532.127
	9:05	359.144	448.115	530.227
	9:10	358.094	446.646	528.332
	9:15	357.046	445.180	526.443
	9:20	356.001	443.718	524.560
	9:25	354.958	442.260	522.683
	9:30	353.918	440.807	520.811
	9:35	352.879	439.357	518.945
	9:40	351.844	437.911	517.085
	9:45	350.810	436.469	515.231
	9:50	349.779	435.032	513.382
	9:55	348.750	433.598	511.539
	10:00	347.724	432.168	509.701
	10:05	346.699	430.742	507.870
	10:10	345.678	429.320	506.043
	10:15	344.658	427.902	504.223
	10:20	343.641	426.488	502.408
	10:25	342.627	425.078	500.599
	10:30	341.615	423.673	498.795
	10:35	340.606	422.271	496.998
	10:40	339.599	420.873	495.206
	10:45	338.595	419.480	493.419
	10:50	337.593	418.090	491.639
	10:55	336.593	416.704	489.863
	11:00	335.596	415.323	488.094
	11:05	334.602	413.945	486.330
	11:10	333.610	412.571	484.571
	11:15	332.621	411.201	482.818
	11:20	331.634	409.835	481.070
	11:25	330.649	408.473	479.328
	11:30	329.667	407.115	477.591
	11:35	328.688	405.761	475.860
	11:40	327.711	404.411	474.134
	11:45	326.736	403.064	472.413
	11:50	325.764	401.722	470.698
	11:55	324.795	400.383	468.989

Yola Hydrographs				
	Time	100-Year	1000-Year	10000-Year
Day 5	12:00	323.828	399.048	467.284
	12:05	322.864	397.717	465.585
	12:10	321.902	396.390	463.892
	12:15	320.942	395.067	462.204
	12:20	319.986	393.747	460.521
	12:25	319.031	392.432	458.843
	12:30	318.079	391.120	457.171
	12:35	317.130	389.812	455.504
	12:40	316.183	388.507	453.842
	12:45	315.239	387.207	452.186
	12:50	314.297	385.910	450.535
	12:55	313.358	384.617	448.889
	13:00	312.421	383.328	447.248
	13:05	311.486	382.042	445.613
	13:10	310.554	380.761	443.982
	13:15	309.625	379.482	442.357
	13:20	308.698	378.208	440.737
	13:25	307.773	376.937	439.122
	13:30	306.850	375.669	437.512
	13:35	305.930	374.405	435.907
	13:40	305.013	373.145	434.308
	13:45	304.098	371.889	432.713
	13:50	303.185	370.636	431.123
	13:55	302.275	369.386	429.539
	14:00	301.367	368.141	427.959
	14:05	300.461	366.898	426.385
	14:10	299.558	365.660	424.816
	14:15	298.657	364.424	423.251
	14:20	297.758	363.193	421.692
	14:25	296.861	361.964	420.137
	14:30	295.967	360.740	418.588
	14:35	295.075	359.518	417.043
	14:40	294.186	358.300	415.503
	14:45	293.299	357.086	413.969
	14:50	292.413	355.875	412.439
	14:55	291.531	354.668	410.914
	15:00	290.650	353.464	409.394
	15:05	289.772	352.263	407.879
	15:10	288.896	351.066	406.369
	15:15	288.022	349.872	404.864
	15:20	287.150	348.682	403.364
	15:25	286.281	347.495	401.868
	15:30	285.413	346.311	400.377
	15:35	284.548	345.131	398.892
	15:40	283.685	343.954	397.411
	15:45	282.824	342.780	395.935
	15:50	281.966	341.610	394.463
	15:55	281.109	340.443	392.997
	16:00	280.255	339.279	391.535
	16:05	279.403	338.119	390.078
	16:10	278.553	336.963	388.626
	16:15	277.705	335.809	387.179
	16:20	276.859	334.659	385.737
	16:25	276.015	333.512	384.300
	16:30	275.173	332.369	382.867
	16:35	274.334	331.229	381.439
	16:40	273.496	330.092	380.016
	16:45	272.660	328.958	378.597
	16:50	271.827	327.828	377.184
	16:55	270.996	326.701	375.775
	17:00	270.166	325.577	374.371
	17:05	269.339	324.457	372.971
	17:10	268.514	323.340	371.577
	17:15	267.691	322.226	370.187
	17:20	266.870	321.116	368.802
	17:25	266.051	320.009	367.421
	17:30	265.234	318.905	366.046
	17:35	264.419	317.804	364.675
	17:40	263.606	316.707	363.308
	17:45	262.794	315.612	361.947
	17:50	261.985	314.521	360.590
	17:55	261.178	313.434	359.237
	18:00	260.373	312.349	357.890
	18:05	259.570	311.268	356.547
	18:10	258.769	310.191	355.209
	18:15	257.970	309.116	353.875
	18:20	257.173	308.045	352.546
	18:25	256.378	306.977	351.222
	18:30	255.585	305.912	349.903
	18:35	254.794	304.850	348.588
	18:40	254.005	303.792	347.277
	18:45	253.218	302.737	345.972
	18:50	252.432	301.685	344.670
	18:55	251.649	300.636	343.374
	19:00	250.868	299.591	342.082
	19:05	250.089	298.549	340.795
	19:10	249.311	297.510	339.512
	19:15	248.536	296.474	338.234
	19:20	247.763	295.442	336.960
	19:25	246.991	294.413	335.691
	19:30	246.222	293.387	334.427
	19:35	245.455	292.364	333.167
	19:40	244.689	291.344	331.911
	19:45	243.925	290.328	330.660
	19:50	243.164	289.314	329.414
	19:55	242.404	288.304	328.172
	20:00	241.646	287.298	326.934
	20:05	240.891	286.294	325.701
	20:10	240.137	285.293	324.473
	20:15	239.385	284.296	323.249
	20:20	238.635	283.302	322.029
	20:25	237.887	282.311	320.814
	20:30	237.141	281.324	319.604
	20:35	236.397	280.339	318.397
	20:40	235.655	279.358	317.196
	20:45	234.915	278.380	315.998
	20:50	234.177	277.405	314.805
	20:55	233.441	276.433	313.617
	21:00	232.707	275.465	312.433
	21:05	231.975	274.499	311.253
	21:10	231.244	273.537	310.078
	21:15	230.516	272.578	308.907
	21:20	229.790	271.622	307.740
	21:25	229.065	270.669	306.577
	21:30	228.343	269.719	305.419
	21:35	227.622	268.772	304.266
	21:40	226.904	267.829	303.116
	21:45	226.187	266.889	301.971
	21:50	225.472	265.951	300.830
	21:55	224.760	265.017	299.693
	22:00	224.049	264.086	298.561
	22:05	223.340	263.158	297.433
	22:10	222.633	262.233	296.309
	22:15	221.928	261.311	295.189
	22:20	221.225	260.393	294.074
	22:25	220.524	259.477	292.962
	22:30	219.825	258.564	291.855
	22:35	219.128	257.655	290.752
	22:40	218.432	256.749	289.654
	22:45	217.738	255.845	288.559
	22:50	217.048	254.945	287.469
	22:55	216.358	254.048	286.382
	23:00	215.671	253.153	285.300
	23:05	214.985	252.262	284.222
	23:10	214.302	251.374	283.148
	23:15	213.620	250.489	282.078
	23:20	212.941	249.607	281.013
	23:25	212.263	248.728	279.951
	23:30	211.587	247.852	278.893
	23:35	210.913	246.978	277.840
	23:40	210.241	246.108	276.790
	23:45	209.571	245.241	275.745
	23:50	208.903	244.377	274.703
	23:55	208.237	243.516	273.665

Yola Hydrographs				
	Time	100-Year	1000-Year	10000-Year
Day 6	0:00	207.572	242.657	272.632
	0:05	206.910	241.802	271.602
	0:10	206.249	240.950	270.576
	0:15	205.591	240.100	269.554
	0:20	204.934	239.254	268.537
	0:25	204.279	238.410	267.523
	0:30	203.628	237.570	266.513
	0:35	202.979	236.732	265.506
	0:40	202.325	235.897	264.504
	0:45	201.679	235.065	263.506
	0:50	201.034	234.236	262.511
	0:55	200.391	233.410	261.521
	1:00	199.749	232.587	260.534
	1:05	199.110	231.766	259.551
	1:10	198.472	230.949	258.572
	1:15	197.837	230.134	257.597
	1:20	197.203	229.322	256.625
	1:25	196.571	228.514	255.657
	1:30	195.941	227.707	254.693
	1:35	195.313	226.904	253.733
	1:40	194.686	226.104	252.777
	1:45	194.062	225.306	251.824
	1:50	193.440	224.511	250.875
	1:55	192.819	223.720	249.930
	2:00	192.200	222.930	248.988
	2:05	191.583	222.144	248.050
	2:10	190.969	221.361	247.116
	2:15	190.355	220.580	246.185
	2:20	189.744	219.802	245.259
	2:25	189.135	219.027	244.335
	2:30	188.527	218.254	243.416
	2:35	187.922	217.485	242.500
	2:40	187.318	216.718	241.588
	2:45	186.716	215.954	240.679
	2:50	186.116	215.192	239.774
	2:55	185.518	214.434	238.873
	3:00	184.921	213.678	237.975
	3:05	184.327	212.925	237.081
	3:10	183.734	212.174	236.190
	3:15	183.144	211.427	235.303
	3:20	182.555	210.682	234.419
	3:25	181.968	209.939	233.539
	3:30	181.383	209.200	232.663
	3:35	180.799	208.463	231.790
	3:40	180.218	207.729	230.920
	3:45	179.638	206.997	230.054
	3:50	179.059	206.269	229.191
	3:55	178.484	205.542	228.332
	4:00	177.910	204.819	227.477
	4:05	177.338	204.098	226.625
	4:10	176.767	203.380	225.776
	4:15	176.198	202.664	224.931
	4:20	175.632	201.951	224.089
	4:25	175.067	201.241	223.250
	4:30	174.503	200.534	222.415
	4:35	173.942	199.829	221.583
	4:40	173.382	199.126	220.755
	4:45	172.825	198.426	219.930
	4:50	172.269	197.729	219.109
	4:55	171.714	197.035	218.290
	5:00	171.162	196.343	217.475
	5:05	170.611	195.653	216.664
	5:10	170.062	194.966	215.855
	5:15	169.515	194.282	215.050
	5:20	168.970	193.600	214.248
	5:25	168.427	192.921	213.450
	5:30	167.885	192.244	212.655
	5:35	167.345	191.570	211.863
	5:40	166.807	190.898	211.074
	5:45	166.270	190.229	210.289
	5:50	165.736	189.563	209.506
	5:55	165.203	188.898	208.727
	6:00	164.672	188.237	207.951
	6:05	164.142	187.578	207.179
	6:10	163.615	186.921	206.409
	6:15	163.089	186.267	205.643
	6:20	162.565	185.615	204.879
	6:25	162.042	184.966	204.119
	6:30	161.522	184.319	203.362
	6:35	161.003	183.675	202.608
	6:40	160.485	183.033	201.858
	6:45	159.970	182.393	201.110
	6:50	159.456	181.756	200.365
	6:55	158.944	181.122	199.624
	7:00	158.434	180.489	198.885
	7:05	157.925	179.860	198.150
	7:10	157.418	179.232	197.418
	7:15	156.913	178.607	196.688
	7:20	156.409	177.984	195.962
	7:25	155.907	177.364	195.239
	7:30	155.407	176.746	194.518
	7:35	154.909	176.130	193.801
	7:40	154.412	175.517	193.086
	7:45	153.917	174.906	192.375
	7:50	153.423	174.298	191.666
	7:55	152.932	173.691	190.961
	8:00	152.441	173.087	190.258
	8:05	151.953	172.486	189.559
	8:10	151.466	171.887	188.862
	8:15	150.981	171.290	188.168
	8:20	150.497	170.695	187.477
	8:25	150.016	170.102	186.789
	8:30	149.535	169.512	186.104
	8:35	149.057	168.924	185.421
	8:40	148.580	168.339	184.742
	8:45	148.105	167.755	184.065
	8:50	147.631	167.174	183.391
	8:55	147.159	166.595	182.720
	9:00	146.688	166.019	182.052
	9:05	146.220	165.444	181.386
	9:10	145.752	164.872	180.724
	9:15	145.287	164.302	180.064
	9:20	144.823	163.735	179.406
	9:25	144.360	163.169	178.752
	9:30	143.900	162.606	178.100
	9:35	143.440	162.044	177.452
	9:40	142.983	161.485	176.805
	9:45	142.527	160.929	176.162
	9:50	142.072	160.374	175.521
	9:55	141.619	159.821	174.883
	10:00	141.168	159.271	174.248
	10:05	140.718	158.723	173.615
	10:10	140.270	158.177	172.985
	10:15	139.824	157.633	172.357
	10:20	139.378	157.091	171.732
	10:25	138.935	156.551	171.110
	10:30	138.493	156.013	170.491
	10:35	138.052	155.478	169.873
	10:40	137.613	154.944	169.259
	10:45	137.176	154.413	168.647
	10:50	136.740	153.883	168.037
	10:55	136.305	153.356	167.430
	11:00	135.872	152.830	166.826
	11:05	135.441	152.307	166.224
	11:10	135.011	151.785	165.625
	11:15	134.582	151.266	165.028
	11:20	134.155	150.748	164.433
	11:25	133.729	150.233	163.841
	11:30	133.305	149.720	163.252
	11:35	132.882	149.208	162.664
	11:40	132.461	148.699	162.080
	11:45	132.041	148.191	161.498
	11:50	131.623	147.686	160.918
	11:55	131.206	147.182	160.340

Yola Hydrographs				
	Time	100-Year	1000-Year	10000-Year
Day 6	12:00	130.791	146.680	159.765
	12:05	130.377	146.181	159.193
	12:10	129.964	145.683	158.622
	12:15	129.553	145.187	158.054
	12:20	129.144	144.693	157.489
	12:25	128.735	144.201	156.926
	12:30	128.328	143.710	156.365
	12:35	127.923	143.222	155.806
	12:40	127.519	142.736	155.249
	12:45	127.116	142.251	154.695
	12:50	126.715	141.768	154.144
	12:55	126.315	141.287	153.594
	13:00	125.916	140.808	153.047
	13:05	125.519	140.331	152.502
	13:10	125.123	139.855	151.959
	13:15	124.729	139.382	151.418
	13:20	124.336	138.910	150.880
	13:25	123.944	138.440	150.344
	13:30	123.553	137.972	149.810
	13:35	123.164	137.505	149.278
	13:40	122.777	137.040	148.748
	13:45	122.390	136.578	148.221
	13:50	122.005	136.116	147.696
	13:55	121.621	135.657	147.173
	14:00	121.239	135.200	146.652
	14:05	120.858	134.744	146.133
	14:10	120.478	134.290	145.616
	14:15	120.100	133.837	145.102
	14:20	119.723	133.387	144.589
	14:25	119.347	132.938	144.079
	14:30	118.973	132.491	143.571
	14:35	118.600	132.046	143.065
	14:40	118.228	131.602	142.561
	14:45	117.857	131.160	142.059
	14:50	117.488	130.720	141.559
	14:55	117.120	130.281	141.061
	15:00	116.753	129.844	140.565
	15:05	116.388	129.409	140.071
	15:10	116.024	128.975	139.579
	15:15	115.661	128.543	139.090
	15:20	115.299	128.113	138.602
	15:25	114.938	127.685	138.116
	15:30	114.580	127.258	137.632
	15:35	114.222	126.832	137.151
	15:40	113.865	126.409	136.671
	15:45	113.510	125.987	136.193
	15:50	113.156	125.566	135.717
	15:55	112.803	125.148	135.243
	16:00	112.451	124.730	134.771
	16:05	112.101	124.315	134.301
	16:10	111.752	123.901	133.833
	16:15	111.404	123.488	133.367
	16:20	111.057	123.078	132.902
	16:25	110.712	122.668	132.440
	16:30	110.367	122.261	131.979
	16:35	110.024	121.855	131.521
	16:40	109.682	121.450	131.064
	16:45	109.342	121.047	130.609
	16:50	109.002	120.646	130.156
	16:55	108.664	120.246	129.705
	17:00	108.327	119.848	129.255
	17:05	107.991	119.451	128.808
	17:10	107.656	119.056	128.362
	17:15	107.322	118.662	127.918
	17:20	106.990	118.270	127.476
	17:25	106.659	117.879	127.035
	17:30	106.329	117.490	126.597
	17:35	106.000	117.102	126.160
	17:40	105.672	116.716	125.725
	17:45	105.345	116.331	125.292
	17:50	105.020	115.948	124.860
	17:55	104.695	115.566	124.430
	18:00	104.372	115.186	124.002
	18:05	104.050	114.807	123.576
	18:10	103.729	114.430	123.151
	18:15	103.410	114.054	122.728
	18:20	103.091	113.679	122.307
	18:25	102.773	113.306	121.887
	18:30	102.457	112.934	121.469
	18:35	102.142	112.564	121.053
	18:40	101.827	112.195	120.639
	18:45	101.514	111.828	120.226
	18:50	101.202	111.462	119.814
	18:55	100.892	111.098	119.405
	19:00	100.582	110.734	118.997
	19:05	100.273	110.373	118.590
	19:10	99.965	110.012	118.185
	19:15	99.659	109.653	117.782
	19:20	99.354	109.296	117.380
	19:25	99.049	108.939	116.980
	19:30	98.746	108.585	116.582
	19:35	98.444	108.231	116.185
	19:40	98.143	107.879	115.789
	19:45	97.842	107.528	115.396
	19:50	97.543	107.179	115.003
	19:55	97.245	106.830	114.612
	20:00	96.949	106.484	114.223
	20:05	96.653	106.138	113.835
	20:10	96.358	105.794	113.449
	20:15	96.064	105.451	113.064
	20:20	95.771	105.110	112.680
	20:25	95.480	104.769	112.298
	20:30	95.189	104.430	111.918
	20:35	94.899	104.093	111.539
	20:40	94.611	103.758	111.161
	20:45	94.323	103.421	110.785
	20:50	94.036	103.087	110.410
	20:55	93.751	102.755	110.036
	21:00	93.466	102.424	109.664
	21:05	93.183	102.094	109.293
	21:10	92.900	101.765	108.924
	21:15	92.618	101.437	108.556
	21:20	92.338	101.111	108.189
	21:25	92.058	100.786	107.823
	21:30	91.780	100.462	107.459
	21:35	91.502	100.139	107.096
	21:40	91.225	99.818	106.735
	21:45	90.950	99.498	106.375
	21:50	90.675	99.179	106.016
	21:55	90.401	98.861	105.658
	22:00	90.129	98.544	105.301
	22:05	89.857	98.229	104.946
	22:10	89.586	97.915	104.592
	22:15	89.316	97.602	104.239
	22:20	89.047	97.290	103.888
	22:25	88.779	96.979	103.537
	22:30	88.512	96.669	103.188
	22:35	88.246	96.361	102.840
	22:40	87.981	96.054	102.493
	22:45	87.717	95.748	102.147
	22:50	87.453	95.442	101.802
	22:55	87.191	95.139	101.459
	23:00	86.930	94.836	101.116
	23:05	86.669	94.534	100.775
	23:10	86.410	94.234	100.435
	23:15	86.151	93.934	100.096
	23:20	85.893	93.636	99.757
	23:25	85.636	93.339	99.420
	23:30	85.380	93.042	99.084
	23:35	85.125	92.747	98.749
	23:40	84.871	92.453	98.415
	23:45	84.618	92.160	98.082
	23:50	84.366	91.868	97.751
	23:55	84.114	91.577	97.420

Yola Hydrographs

Time	100-Year	1000-Year	10000-Year
Day 7 0:00	83.963	91.288	97.090
0:05	83.614	90.999	96.761
0:10	83.365	90.711	96.433
0:15	83.117	90.424	96.106
0:20	82.870	90.139	95.779
0:25	82.624	89.854	95.454
0:30	82.378	89.570	95.130
0:35	82.134	89.287	94.807
0:40	81.890	89.005	94.484
0:45	81.647	88.725	94.163
0:50	81.406	88.445	93.842
0:55	81.164	88.166	93.522
1:00	80.924	87.888	93.203
1:05	80.685	87.611	92.885
1:10	80.446	87.335	92.568
1:15	80.209	87.060	92.252
1:20	79.972	86.786	91.936
1:25	79.736	86.513	91.621
1:30	79.500	86.240	91.307
1:35	79.266	85.969	90.994
1:40	79.032	85.698	90.682
1:45	78.800	85.429	90.370
1:50	78.569	85.160	90.059
1:55	78.337	84.892	89.749
2:00	78.108	84.625	89.440
2:05	77.877	84.359	89.131
2:10	77.648	84.094	88.823
2:15	77.420	83.830	88.516
2:20	77.193	83.566	88.209
2:25	76.967	83.303	87.904
2:30	76.741	83.041	87.598
2:35	76.516	82.780	87.294
2:40	76.292	82.520	86.990
2:45	76.069	82.260	86.686
2:50	75.846	82.002	86.384
2:55	75.625	81.744	86.081
3:00	75.404	81.487	85.780
3:05	75.184	81.230	85.478
3:10	74.964	80.975	85.178
3:15	74.746	80.720	84.878
3:20	74.528	80.466	84.578
3:25	74.311	80.212	84.278
3:30	74.094	79.960	83.979
3:35	73.879	79.708	83.681
3:40	73.664	79.457	83.382
3:45	73.449	79.206	83.084
3:50	73.236	78.957	82.787
3:55	73.023	78.708	82.489
4:00	72.811	78.459	82.191
4:05	72.600	78.212	81.894
4:10	72.389	77.965	81.596
4:15	72.180	77.718	81.299
4:20	71.970	77.473	81.001
4:25	71.762	77.228	80.703
4:30	71.554	76.984	80.405
4:35	71.347	76.740	80.107
4:40	71.141	76.497	79.808
4:45	70.935	76.255	79.508
4:50	70.730	76.013	79.208
4:55	70.526	75.772	78.906
5:00	70.323	75.531	78.604
5:05	70.120	75.291	78.301
5:10	69.917	75.052	77.996
5:15	69.716	74.813	77.689
5:20	69.515	74.575	77.381
5:25	69.315	74.338	77.070
5:30	69.115	74.101	76.758
5:35	68.916	73.864	76.442
5:40	68.718	73.629	76.123
5:45	68.520	73.393	75.801
5:50	68.323	73.159	75.475
5:55	68.127	72.925	75.145
6:00	67.931	72.691	74.809
6:05	67.736	72.458	74.467
6:10	67.542	72.225	74.119
6:15	67.349	71.993	73.763
6:20	67.154	71.762	73.398
6:25	66.962	71.531	73.022
6:30	66.770	71.300	72.635
6:35	66.578	71.070	72.234
6:40	66.388	70.841	71.817
6:45	66.197	70.611	71.380
6:50	66.008	70.383	70.921
6:55	65.819	70.154	70.435
7:00	65.630	69.927	69.917
7:05	65.442	69.699	69.366
7:10	65.255	69.472	68.795
7:15	65.068	69.246	68.169
7:20	64.882	69.019	67.517
7:25	64.696	68.794	66.832
7:30	64.511	68.568	66.114
7:35	64.327	68.343	65.366
7:40	64.143	68.119	64.589
7:45	63.959	67.893	63.788
7:50	63.776	67.669	62.969
7:55	63.594	67.445	62.136
8:00	63.412	67.221	61.295
8:05	63.231	66.997	60.454
8:10	63.050	66.774	59.620
8:15	62.870	66.551	58.798
8:20	62.690	66.327	57.997
8:25	62.511	66.104	57.220
8:30	62.332	65.881	56.474
8:35	62.154	65.658	55.762
8:40	61.976	65.434	55.086
8:45	61.799	65.211	54.447
8:50	61.622	64.987	53.848
8:55	61.446	64.764	53.288
9:00	61.270	64.539	52.761
9:05	61.095	64.315	52.271
9:10	60.920	64.090	51.813
9:15	60.745	63.865	51.386
9:20	60.571	63.638	50.986
9:25	60.398	63.411	50.610
9:30	60.225	63.184	50.257
9:35	60.052	62.955	49.923
9:40	59.880	62.725	49.607
9:45	59.708	62.493	49.306
9:50	59.537	62.260	49.019
9:55	59.366	62.026	48.744
10:00	59.196	61.789	48.479
10:05	59.026	61.550	48.223
10:10	58.856	61.308	47.976
10:15	58.687	61.064	47.735
10:20	58.518	60.819	47.500
10:25	58.350	60.564	47.272
10:30	58.182	60.309	47.049
10:35	58.014	60.048	46.830
10:40	57.847	59.782	46.615
10:45	57.681	59.510	46.404
10:50	57.514	59.230	46.197
10:55	57.348	58.942	45.992
11:00	57.182	58.644	45.791
11:05	57.017	58.334	45.592
11:10	56.852	58.011	45.395
11:15	56.688	57.673	45.201
11:20	56.524	57.315	45.010
11:25	56.360	56.935	44.820
11:30	56.197	56.528	44.632
11:35	56.034	56.094	44.447
11:40	55.871	55.632	44.263
11:45	55.709	55.139	44.080
11:50	55.547	54.617	43.900
11:55	55.385	54.064	43.721

Yola Hydrographs

Time	100-Year	1000-Year	10000-Year
Day 7 12:00	55.224	53.483	43.544
12:05	55.063	52.874	43.368
12:10	54.903	52.240	43.193
12:15	54.742	51.585	43.020
12:20	54.583	50.912	42.849
12:25	54.423	50.228	42.679
12:30	54.264	49.537	42.510
12:35	54.105	48.847	42.342
12:40	53.946	48.162	42.175
12:45	53.788	47.491	42.010
12:50	53.630	46.838	41.846
12:55	53.472	46.208	41.683
13:00	53.315	45.606	41.521
13:05	53.157	45.036	41.361
13:10	53.001	44.498	41.201
13:15	52.844	43.994	41.042
13:20	52.688	43.524	40.885
13:25	52.531	43.088	40.728
13:30	52.376	42.682	40.572
13:35	52.220	42.307	40.418
13:40	52.065	41.959	40.264
13:45	51.909	41.636	40.111
13:50	51.754	41.335	39.960
13:55	51.600	41.054	39.809
14:00	51.445	40.790	39.659
14:05	51.291	40.542	39.510
14:10	51.136	40.307	39.361
14:15	50.982	40.085	39.214
14:20	50.828	39.872	39.067
14:25	50.674	39.668	38.922
14:30	50.521	39.472	38.777
14:35	50.367	39.283	38.632
14:40	50.213	39.098	38.489
14:45	50.060	38.921	38.347
14:50	49.906	38.747	38.205
14:55	49.752	38.577	38.064
15:00	49.599	38.411	37.924
15:05	49.445	38.248	37.784
15:10	49.291	38.088	37.645
15:15	49.137	37.930	37.507
15:20	48.983	37.775	37.370
15:25	48.828	37.622	37.234
15:30	48.673	37.471	37.098
15:35	48.518	37.322	36.963
15:40	48.363	37.175	36.828
15:45	48.206	37.029	36.694
15:50	48.050	36.885	36.561
15:55	47.892	36.742	36.429
16:00	47.734	36.601	36.297
16:05	47.575	36.461	36.166
16:10	47.415	36.322	36.036
16:15	47.254	36.185	35.906
16:20	47.092	36.048	35.777
16:25	46.928	35.913	35.649
16:30	46.762	35.779	35.521
16:35	46.595	35.646	35.394
16:40	46.425	35.514	35.267
16:45	46.254	35.383	35.141
16:50	46.079	35.253	35.016
16:55	45.901	35.124	34.891
17:00	45.720	34.996	34.767
17:05	45.535	34.868	34.644
17:10	45.345	34.742	34.521
17:15	45.150	34.616	34.399
17:20	44.949	34.491	34.277
17:25	44.741	34.367	34.156
17:30	44.524	34.244	34.036
17:35	44.299	34.122	33.916
17:40	44.066	34.000	33.796
17:45	43.811	33.879	33.677
17:50	43.543	33.759	33.559
17:55	43.257	33.640	33.442
18:00	42.948	33.521	33.324
18:05	42.616	33.403	33.208
18:10	42.261	33.286	33.092
18:15	41.880	33.169	32.976
18:20	41.474	33.053	32.861
18:25	41.042	32.938	32.747
18:30	40.597	32.823	32.633
18:35	40.109	32.709	32.520
18:40	39.611	32.596	32.407
18:45	39.097	32.483	32.294
18:50	38.570	32.370	32.183
18:55	38.036	32.259	32.071
19:00	37.500	32.148	31.960
19:05	36.968	32.037	31.850
19:10	36.445	31.927	31.740
19:15	35.937	31.818	31.631
19:20	35.449	31.709	31.522
19:25	34.984	31.601	31.413
19:30	34.545	31.494	31.305
19:35	34.135	31.386	31.198
19:40	33.753	31.280	31.091
19:45	33.401	31.174	30.984
19:50	33.076	31.068	30.878
19:55	32.778	30.963	30.773
20:00	32.505	30.859	30.667
20:05	32.254	30.755	30.563
20:10	32.023	30.652	30.458
20:15	31.810	30.549	30.354
20:20	31.613	30.446	30.251
20:25	31.429	30.344	30.148
20:30	31.257	30.243	30.045
20:35	31.095	30.142	29.943
20:40	30.942	30.042	29.841
20:45	30.796	29.942	29.739
20:50	30.656	29.842	29.638
20:55	30.522	29.743	29.537
21:00	30.393	29.644	29.437
21:05	30.268	29.546	29.337
21:10	30.146	29.449	29.237
21:15	30.027	29.351	29.138
21:20	29.911	29.255	29.039
21:25	29.798	29.158	28.940
21:30	29.686	29.063	28.842
21:35	29.576	28.967	28.744
21:40	29.468	28.872	28.646
21:45	29.362	28.778	28.549
21:50	29.256	28.683	28.452
21:55	29.153	28.590	28.355
22:00	29.050	28.496	28.259
22:05	28.948	28.404	28.162
22:10	28.848	28.311	28.066
22:15	28.748	28.219	27.970
22:20	28.650	28.127	27.875
22:25	28.552	28.036	27.779
22:30	28.455	27.945	27.684
22:35	28.359	27.855	27.589
22:40	28.264	27.765	27.494
22:45	28.169	27.675	27.399
22:50	28.075	27.586	27.304
22:55	27.982	27.497	27.209
23:00	27.890	27.408	27.115
23:05	27.798	27.320	27.020
23:10	27.707	27.233	26.926
23:15	27.616	27.145	26.831
23:20	27.526	27.058	26.736
23:25	27.437	26.971	26.642
23:30	27.348	26.885	26.547
23:35	27.259	26.799	26.452
23:40	27.172	26.714	26.357
23:45	27.085	26.628	26.261
23:50	26.998	26.544	26.166
23:55	26.912	26.459	26.070

Yola Hydrographs

Time	100-Year	1000-Year	10000-Year
Day 8 0:00	26.826	26.375	25.973
0:05	26.741	26.291	25.877
0:10	26.656	26.208	25.779
0:15	26.572	26.124	25.682
0:20	26.488	26.042	25.583
0:25	26.405	25.959	25.484
0:30	26.322	25.877	25.384
0:35	26.240	25.795	25.284
0:40	26.158	25.714	25.182
0:45	26.076	25.633	25.080
0:50	25.995	25.552	24.976
0:55	25.915	25.471	24.871
1:00	25.834	25.391	24.765
1:05	25.755	25.311	24.657
1:10	25.675	25.231	24.548
1:15	25.596	25.152	24.437
1:20	25.517	25.073	24.324
1:25	25.439	24.994	24.209
1:30	25.361	24.916	24.092
1:35	25.284	24.838	23.972
1:40	25.207	24.760	23.849
1:45	25.130	24.683	23.723
1:50	25.053	24.606	23.594
1:55	24.977	24.529	23.461
2:00	24.902	24.452	23.324
2:05	24.826	24.376	23.182
2:10	24.751	24.300	23.037
2:15	24.677	24.224	22.886
2:20	24.602	24.149	22.732
2:25	24.528	24.073	22.573
2:30	24.455	23.998	22.410
2:35	24.382	23.924	22.243
2:40	24.309	23.849	22.072
2:45	24.236	23.775	21.897
2:50	24.164	23.701	21.718
2:55	24.092	23.628	21.536
3:00	24.020	23.555	21.350
3:05	23.949	23.481	21.161
3:10	23.878	23.409	20.970
3:15	23.807	23.336	20.775
3:20	23.736	23.264	20.578
3:25	23.666	23.192	20.379
3:30	23.596	23.120	20.177
3:35	23.527	23.048	19.974
3:40	23.458	22.977	19.770
3:45	23.389	22.906	19.564
3:50	23.320	22.835	19.357
3:55	23.252	22.764	19.150
4:00	23.184	22.694	18.942
4:05	23.116	22.624	18.734
4:10	23.048	22.554	18.527
4:15	22.981	22.484	18.320
4:20	22.914	22.415	18.114
4:25	22.847	22.345	17.909
4:30	22.781	22.276	17.705
4:35	22.715	22.207	17.502
4:40	22.649	22.139	17.301
4:45	22.583	22.070	17.102
4:50	22.518	22.002	16.906
4:55	22.452	21.934	16.711
5:00	22.387	21.866	16.519
5:05	22.323	21.798	16.329
5:10	22.258	21.730	16.142
5:15	22.194	21.663	15.958
5:20	22.130	21.595	15.777
5:25	22.067	21.528	15.598
5:30	22.003	21.461	15.423
5:35	21.940	21.394	15.250
5:40	21.877	21.328	15.081
5:45	21.814	21.261	14.914
5:50	21.752	21.194	14.751
5:55	21.690	21.128	14.591
6:00	21.628	21.061	14.433
6:05	21.566	20.995	14.279
6:10	21.504	20.929	14.128
6:15	21.443	20.862	13.979
6:20	21.382	20.796	13.834
6:25	21.321	20.730	13.691
6:30	21.260	20.664	13.551
6:35	21.200	20.598	13.414
6:40	21.139	20.531	13.279
6:45	21.079	20.465	13.147
6:50	21.020	20.398	13.018
6:55	20.960	20.332	12.890
7:00	20.901	20.265	12.765
7:05	20.841	20.199	12.643
7:10	20.782	20.132	12.522
7:15	20.724	20.064	12.404
7:20	20.665	19.997	12.287
7:25	20.607	19.929	12.172
7:30	20.548	19.862	12.060
7:35	20.490	19.793	11.948
7:40	20.433	19.725	11.838
7:45	20.375	19.655	11.730
7:50	20.318	19.586	11.623
7:55	20.260	19.516	11.517
8:00	20.203	19.445	11.412
8:05	20.147	19.374	11.308
8:10	20.090	19.302	11.205
8:15	20.034	19.229	11.103
8:20	19.977	19.155	11.002
8:25	19.921	19.081	10.904
8:30	19.865	19.005	10.811
8:35	19.810	18.929	10.721
8:40	19.754	18.851	10.633
8:45	19.699	18.772	10.547
8:50	19.644	18.691	10.462
8:55	19.589	18.609	10.379
9:00	19.534	18.525	10.296
9:05	19.479	18.439	10.215
9:10	19.425	18.351	10.135
9:15	19.371	18.261	10.055
9:20	19.317	18.168	9.977
9:25	19.263	18.073	9.900
9:30	19.209	17.974	9.824
9:35	19.156	17.873	9.748
9:40	19.102	17.768	9.674
9:45	19.049	17.660	9.601
9:50	18.996	17.549	9.528
9:55	18.943	17.435	9.456
10:00	18.890	17.318	9.386
10:05	18.838	17.197	9.316
10:10	18.786	17.074	9.246
10:15	18.733	16.948	9.178
10:20	18.681	16.819	9.110
10:25	18.630	16.687	9.043
10:30	18.578	16.552	8.977
10:35	18.526	16.415	8.911
10:40	18.475	16.275	8.847
10:45	18.424	16.132	8.783
10:50	18.373	15.987	8.719
10:55	18.322	15.840	8.656
11:00	18.271	15.690	8.594
11:05	18.221	15.539	8.533
11:10	18.171	15.385	8.472
11:15	18.120	15.230	8.411
11:20	18.070	15.075	8.351
11:25	18.021	14.919	8.292
11:30	17.971	14.767	8.234
11:35	17.921	14.617	8.176
11:40	17.872	14.467	8.118
11:45	17.823	14.317	8.061
11:50	17.774	14.168	8.005
11:55	17.725	14.019	7.949

Yola Hydrographs

Time	100-Year	1000-Year	10000-Year
Day 8 12:00	17.676	13.871	7.893
12:05	17.628	13.723	7.838
12:10	17.579	13.577	7.784
12:15	17.531	13.431	7.730
12:20	17.483	13.287	7.676
12:25	17.435	13.145	7.623
12:30	17.387	13.003	7.571
12:35	17.339	12.864	7.519
12:40	17.292	12.726	7.467
12:45	17.245	12.589	7.415
12:50	17.197	12.455	7.364
12:55	17.150	12.323	7.314
13:00	17.103	12.192	7.264
13:05	17.057	12.064	7.214
13:10	17.010	11.937	7.165
13:15	16.964	11.813	7.116
13:20	16.917	11.691	7.067
13:25	16.871	11.570	7.019
13:30	16.825	11.452	6.971
13:35	16.779	11.336	6.923
13:40	16.734	11.223	6.876
13:45	16.688	11.111	6.829
13:50	16.643	11.001	6.782
13:55	16.597	10.893	6.736
14:00	16.552	10.787	6.690
14:05	16.507	10.684	6.644
14:10	16.462	10.582	6.599
14:15	16.417	10.482	6.553
14:20	16.372	10.384	6.509
14:25	16.327	10.287	6.464
14:30	16.282	10.193	6.420
14:35	16.237	10.100	6.376
14:40	16.192	10.009	6.332
14:45	16.147	9.919	6.288
14:50	16.102	9.831	6.245
14:55	16.057	9.745	6.202
15:00	16.011	9.660	6.159
15:05	15.966	9.576	6.116
15:10	15.919	9.494	6.074
15:15	15.873	9.413	6.031
15:20	15.826	9.334	5.989
15:25	15.778	9.256	5.948
15:30	15.730	9.179	5.906
15:35	15.681	9.104	5.864
15:40	15.630	9.029	5.823
15:45	15.582	8.956	5.782
15:50	15.538	8.884	5.741
15:55	15.496	8.813	5.700
16:00	15.455	8.743	5.660
16:05	15.414	8.674	5.619
16:10	15.374	8.606	5.579
16:15	15.334	8.539	5.539
16:20	15.294	8.473	5.499
16:25	15.254	8.408	5.459
16:30	15.214	8.343	5.419
16:35	15.174	8.280	5.379
16:40	15.135	8.217	5.340
16:45	15.095	8.156	5.300
16:50	15.056	8.095	5.261
16:55	15.016	8.035	5.221
17:00	14.977	7.975	5.182
17:05	14.938	7.916	5.143
17:10	14.898	7.859	5.104
17:15	14.859	7.801	5.065
17:20	14.820	7.745	5.026
17:25	14.781	7.689	4.987
17:30	14.742	7.634	4.948
17:35	14.703	7.579	4.909
17:40	14.664	7.525	4.870
17:45	14.626	7.472	4.831
17:50	14.587	7.419	4.792
17:55	14.548	7.367	4.753
18:00	14.510	7.315	4.714
18:05	14.471	7.264	4.675
18:10	14.432	7.214	4.636
18:15	14.394	7.164	4.597
18:20	14.355	7.114	4.558
18:25	14.316	7.066	4.518
18:30	14.278	7.017	4.479
18:35	14.239	6.969	4.440
18:40	14.200	6.922	4.400
18:45	14.162	6.875	4.360
18:50	14.123	6.828	4.320
18:55	14.084	6.782	4.280
19:00	14.045	6.737	4.240
19:05	14.006	6.692	4.199
19:10	13.967	6.647	4.159
19:15	13.928	6.603	4.117
19:20	13.889	6.559	4.076
19:25	13.850	6.516	4.034
19:30	13.810	6.473	3.992
19:35	13.770	6.430	3.950
19:40	13.730	6.388	3.907
19:45	13.691	6.346	3.863
19:50	13.650	6.304	3.819
19:55	13.610	6.263	3.775
20:00	13.568	6.222	3.729
20:05	13.528	6.182	3.683
20:10	13.487	6.141	3.636
20:15	13.445	6.102	3.588
20:20	13.403	6.062	3.539
20:25	13.361	6.023	3.489
20:30	13.318	5.984	3.437
20:35	13.275	5.945	3.384
20:40	13.231	5.907	3.329
20:45	13.186	5.869	3.272
20:50	13.141	5.832	3.212
20:55	13.095	5.794	3.150
21:00	13.049	5.757	3.085
21:05	13.002	5.720	3.016
21:10	12.954	5.684	2.944
21:15	12.905	5.647	2.867
21:20	12.855	5.611	2.785
21:25	12.804	5.576	2.698
21:30	12.751	5.540	2.605
21:35	12.698	5.505	2.507
21:40	12.642	5.470	2.402
21:45	12.586	5.435	2.290
21:50	12.527	5.400	2.172
21:55	12.467	5.366	2.048
22:00	12.405	5.332	1.919
22:05	12.341	5.298	1.784
22:10	12.275	5.264	1.646
22:15	12.207	5.231	1.506
22:20	12.137	5.197	1.366
22:25	12.066	5.164	1.227
22:30	11.992	5.131	1.090
22:35	11.917	5.099	0.959
22:40	11.839	5.066	0.835
22:45	11.760	5.034	0.719
22:50	11.680	5.002	0.612
22:55	11.598	4.970	0.515
23:00	11.514	4.938	0.429
23:05	11.429	4.906	0.353
23:10	11.343	4.875	0.286
23:15	11.255	4.844	0.229
23:20	11.165	4.812	0.181
23:25	11.075	4.781	0.140
23:30	10.984	4.751	0.107
23:35	10.892	4.720	0.079
23:40	10.799	4.689	0.056
23:45	10.705	4.659	0.037
23:50	10.610	4.629	0.023
23:55	10.515	4.598	0.012

Yola Hydrographs				
	Time	100-Year	1000-Year	10000-Year
Day 9	0:00	10.420	4.568	0.004
	0:05	10.324	4.539	0.002
	0:10	10.228	4.509	0.001
	0:15	10.132	4.479	0.000
	0:20	10.037	4.449	0.000
	0:25	9.941	4.420	0.000
	0:30	9.845	4.391	0.000
	0:35	9.750	4.361	0.000
	0:40	9.656	4.332	0.000
	0:45	9.561	4.303	0.000
	0:50	9.468	4.274	0.000
	0:55	9.375	4.245	0.000
	1:00	9.283	4.216	0.000
	1:05	9.192	4.188	0.000
	1:10	9.101	4.159	0.000
	1:15	9.012	4.130	0.000
	1:20	8.924	4.102	0.000
	1:25	8.836	4.073	0.000
	1:30	8.750	4.045	0.000
	1:35	8.665	4.016	0.000
	1:40	8.581	3.988	0.000
	1:45	8.499	3.959	0.000
	1:50	8.417	3.931	0.000
	1:55	8.337	3.903	0.000
	2:00	8.258	3.874	0.000
	2:05	8.180	3.846	0.000
	2:10	8.104	3.818	0.000
	2:15	8.029	3.789	0.000
	2:20	7.955	3.761	0.000
	2:25	7.882	3.733	0.000
	2:30	7.811	3.704	0.000
	2:35	7.740	3.676	0.000
	2:40	7.671	3.647	0.000
	2:45	7.603	3.619	0.000
	2:50	7.537	3.590	0.000
	2:55	7.471	3.562	0.000
	3:00	7.407	3.533	0.000
	3:05	7.343	3.504	0.000
	3:10	7.281	3.475	0.000
	3:15	7.219	3.446	0.000
	3:20	7.159	3.417	0.000
	3:25	7.100	3.388	0.000
	3:30	7.042	3.359	0.000
	3:35	6.984	3.329	0.000
	3:40	6.928	3.300	0.000
	3:45	6.872	3.270	0.000
	3:50	6.818	3.240	0.000
	3:55	6.764	3.210	0.000
	4:00	6.711	3.179	0.000
	4:05	6.659	3.148	0.000
	4:10	6.608	3.117	0.000
	4:15	6.557	3.086	0.000
	4:20	6.507	3.054	0.000
	4:25	6.458	3.022	0.000
	4:30	6.410	2.989	0.000
	4:35	6.362	2.956	0.000
	4:40	6.315	2.922	0.000
	4:45	6.269	2.887	0.000
	4:50	6.223	2.852	0.000
	4:55	6.178	2.816	0.000
	5:00	6.133	2.779	0.000
	5:05	6.089	2.741	0.000
	5:10	6.046	2.702	0.000
	5:15	6.003	2.662	0.000
	5:20	5.961	2.620	0.000
	5:25	5.919	2.576	0.000
	5:30	5.878	2.530	0.000
	5:35	5.837	2.482	0.000
	5:40	5.797	2.431	0.000
	5:45	5.757	2.378	0.000
	5:50	5.718	2.321	0.000
	5:55	5.679	2.261	0.000
	6:00	5.641	2.196	0.000
	6:05	5.603	2.128	0.000
	6:10	5.566	2.055	0.000
	6:15	5.529	1.977	0.000
	6:20	5.492	1.894	0.000
	6:25	5.456	1.806	0.000
	6:30	5.420	1.712	0.000
	6:35	5.385	1.615	0.000
	6:40	5.350	1.512	0.000
	6:45	5.315	1.406	0.000
	6:50	5.281	1.298	0.000
	6:55	5.247	1.189	0.000
	7:00	5.213	1.077	0.000
	7:05	5.180	0.968	0.000
	7:10	5.147	0.861	0.000
	7:15	5.115	0.758	0.000
	7:20	5.082	0.660	0.000
	7:25	5.050	0.569	0.000
	7:30	5.019	0.485	0.000
	7:35	4.987	0.408	0.000
	7:40	4.956	0.339	0.000
	7:45	4.925	0.279	0.000
	7:50	4.895	0.226	0.000
	7:55	4.865	0.180	0.000
	8:00	4.835	0.142	0.000
	8:05	4.805	0.109	0.000
	8:10	4.776	0.081	0.000
	8:15	4.747	0.059	0.000
	8:20	4.718	0.040	0.000
	8:25	4.689	0.024	0.000
	8:30	4.661	0.010	0.000
	8:35	4.632	0.004	0.000
	8:40	4.605	0.002	0.000
	8:45	4.577	0.001	0.000
	8:50	4.549	0.000	0.000
	8:55	4.522	0.000	0.000
	9:00	4.495	0.000	0.000
	9:05	4.468	0.000	0.000
	9:10	4.442	0.000	0.000
	9:15	4.415	0.000	0.000
	9:20	4.389	0.000	0.000
	9:25	4.363	0.000	0.000
	9:30	4.337	0.000	0.000
	9:35	4.312	0.000	0.000
	9:40	4.286	0.000	0.000
	9:45	4.261	0.000	0.000
	9:50	4.236	0.000	0.000
	9:55	4.211	0.000	0.000
	10:00	4.187	0.000	0.000
	10:05	4.162	0.000	0.000
	10:10	4.138	0.000	0.000
	10:15	4.114	0.000	0.000
	10:20	4.090	0.000	0.000
	10:25	4.066	0.000	0.000
	10:30	4.043	0.000	0.000
	10:35	4.019	0.000	0.000
	10:40	3.996	0.000	0.000
	10:45	3.973	0.000	0.000
	10:50	3.950	0.000	0.000
	10:55	3.927	0.000	0.000
	11:00	3.904	0.000	0.000
	11:05	3.881	0.000	0.000
	11:10	3.859	0.000	0.000
	11:15	3.837	0.000	0.000
	11:20	3.815	0.000	0.000
	11:25	3.793	0.000	0.000
	11:30	3.771	0.000	0.000
	11:35	3.749	0.000	0.000
	11:40	3.727	0.000	0.000
	11:45	3.706	0.000	0.000
	11:50	3.684	0.000	0.000
	11:55	3.663	0.000	0.000

Yola Hydrographs				
	Time	100-Year	1000-Year	10000-Year
Day 9	12:00	3.642	0.000	0.000
	12:05	3.621	0.000	0.000
	12:10	3.600	0.000	0.000
	12:15	3.579	0.000	0.000
	12:20	3.559	0.000	0.000
	12:25	3.538	0.000	0.000
	12:30	3.518	0.000	0.000
	12:35	3.497	0.000	0.000
	12:40	3.477	0.000	0.000
	12:45	3.457	0.000	0.000
	12:50	3.437	0.000	0.000
	12:55	3.417	0.000	0.000
	13:00	3.397	0.000	0.000
	13:05	3.377	0.000	0.000
	13:10	3.357	0.000	0.000
	13:15	3.338	0.000	0.000
	13:20	3.318	0.000	0.000
	13:25	3.299	0.000	0.000
	13:30	3.279	0.000	0.000
	13:35	3.260	0.000	0.000
	13:40	3.241	0.000	0.000
	13:45	3.221	0.000	0.000
	13:50	3.202	0.000	0.000
	13:55	3.183	0.000	0.000
	14:00	3.164	0.000	0.000
	14:05	3.145	0.000	0.000
	14:10	3.126	0.000	0.000
	14:15	3.108	0.000	0.000
	14:20	3.089	0.000	0.000
	14:25	3.070	0.000	0.000
	14:30	3.052	0.000	0.000
	14:35	3.033	0.000	0.000
	14:40	3.014	0.000	0.000
	14:45	2.996	0.000	0.000
	14:50	2.977	0.000	0.000
	14:55	2.959	0.000	0.000
	15:00	2.941	0.000	0.000
	15:05	2.922	0.000	0.000
	15:10	2.904	0.000	0.000
	15:15	2.886	0.000	0.000
	15:20	2.867	0.000	0.000
	15:25	2.849	0.000	0.000
	15:30	2.831	0.000	0.000
	15:35	2.813	0.000	0.000
	15:40	2.794	0.000	0.000
	15:45	2.776	0.000	0.000
	15:50	2.758	0.000	0.000
	15:55	2.740	0.000	0.000
	16:00	2.721	0.000	0.000
	16:05	2.703	0.000	0.000
	16:10	2.685	0.000	0.000
	16:15	2.667	0.000	0.000
	16:20	2.648	0.000	0.000
	16:25	2.630	0.000	0.000
	16:30	2.612	0.000	0.000
	16:35	2.593	0.000	0.000
	16:40	2.575	0.000	0.000
	16:45	2.557	0.000	0.000
	16:50	2.538	0.000	0.000
	16:55	2.520	0.000	0.000
	17:00	2.501	0.000	0.000
	17:05	2.482	0.000	0.000
	17:10	2.463	0.000	0.000
	17:15	2.445	0.000	0.000
	17:20	2.426	0.000	0.000
	17:25	2.407	0.000	0.000
	17:30	2.388	0.000	0.000
	17:35	2.368	0.000	0.000
	17:40	2.349	0.000	0.000
	17:45	2.329	0.000	0.000
	17:50	2.310	0.000	0.000
	17:55	2.290	0.000	0.000
	18:00	2.270	0.000	0.000
	18:05	2.250	0.000	0.000
	18:10	2.229	0.000	0.000
	18:15	2.208	0.000	0.000
	18:20	2.187	0.000	0.000
	18:25	2.166	0.000	0.000
	18:30	2.145	0.000	0.000
	18:35	2.123	0.000	0.000
	18:40	2.100	0.000	0.000
	18:45	2.077	0.000	0.000
	18:50	2.054	0.000	0.000
	18:55	2.030	0.000	0.000
	19:00	2.005	0.000	0.000
	19:05	1.979	0.000	0.000
	19:10	1.953	0.000	0.000
	19:15	1.925	0.000	0.000
	19:20	1.896	0.000	0.000
	19:25	1.866	0.000	0.000
	19:30	1.835	0.000	0.000
	19:35	1.802	0.000	0.000
	19:40	1.766	0.000	0.000
	19:45	1.729	0.000	0.000
	19:50	1.689	0.000	0.000
	19:55	1.647	0.000	0.000
	20:00	1.602	0.000	0.000
	20:05	1.553	0.000	0.000
	20:10	1.501	0.000	0.000
	20:15	1.446	0.000	0.000
	20:20	1.387	0.000	0.000
	20:25	1.324	0.000	0.000
	20:30	1.257	0.000	0.000
	20:35	1.187	0.000	0.000
	20:40	1.113	0.000	0.000
	20:45	1.037	0.000	0.000
	20:50	0.959	0.000	0.000
	20:55	0.879	0.000	0.000
	21:00	0.799	0.000	0.000
	21:05	0.720	0.000	0.000
	21:10	0.642	0.000	0.000
	21:15	0.566	0.000	0.000
	21:20	0.494	0.000	0.000
	21:25	0.426	0.000	0.000
	21:30	0.364	0.000	0.000
	21:35	0.306	0.000	0.000
	21:40	0.255	0.000	0.000
	21:45	0.209	0.000	0.000
	21:50	0.169	0.000	0.000
	21:55	0.134	0.000	0.000
	22:00	0.103	0.000	0.000
	22:05	0.078	0.000	0.000
	22:10	0.057	0.000	0.000
	22:15	0.039	0.000	0.000
	22:20	0.024	0.000	0.000
	22:25	0.009	0.000	0.000
	22:30	0.004	0.000	0.000
	22:35	0.001	0.000	0.000
	22:40	0.001	0.000	0.000
	22:45	0.000	0.000	0.000

1.3 Masaka hydrographs

Masaka Hydrographs

	Time	100-Year	1000-Year	10000-Year
Day1	0:00	0.000	0.000	0.000
	0:05	0.000	0.000	0.001
	0:10	0.000	0.000	0.001
	0:15	0.000	0.000	0.002
	0:20	0.000	0.000	0.002
	0:25	0.000	0.000	0.003
	0:30	0.000	0.000	0.004
	0:35	0.000	0.000	0.006
	0:40	0.000	0.000	0.007
	0:45	0.000	0.000	0.009
	0:50	0.000	0.000	0.011
	0:55	0.000	0.000	0.014
	1:00	0.000	0.000	0.017
	1:05	0.000	0.000	0.020
	1:10	0.000	0.000	0.024
	1:15	0.000	0.000	0.028
	1:20	0.000	0.000	0.033
	1:25	0.000	0.000	0.039
	1:30	0.000	0.000	0.046
	1:35	0.000	0.000	0.053
	1:40	0.000	0.000	0.061
	1:45	0.000	0.000	0.069
	1:50	0.000	0.000	0.079
	1:55	0.000	0.000	0.089
	2:00	0.000	0.000	0.101
	2:05	0.000	0.000	0.114
	2:10	0.000	0.000	0.127
	2:15	0.000	0.000	0.142
	2:20	0.000	0.000	0.159
	2:25	0.000	0.000	0.177
	2:30	0.000	0.000	0.196
	2:35	0.000	0.000	0.216
	2:40	0.000	0.000	0.239
	2:45	0.000	0.000	0.263
	2:50	0.000	0.001	0.288
	2:55	0.000	0.001	0.316
	3:00	0.000	0.001	0.346
	3:05	0.000	0.002	0.377
	3:10	0.000	0.002	0.411
	3:15	0.000	0.003	0.446
	3:20	0.000	0.004	0.484
	3:25	0.000	0.005	0.525
	3:30	0.000	0.006	0.567
	3:35	0.000	0.008	0.612
	3:40	0.000	0.010	0.660
	3:45	0.000	0.012	0.709
	3:50	0.000	0.015	0.762
	3:55	0.000	0.018	0.817
	4:00	0.000	0.021	0.875
	4:05	0.000	0.025	0.935
	4:10	0.000	0.029	0.998
	4:15	0.000	0.034	1.064
	4:20	0.000	0.039	1.133
	4:25	0.000	0.045	1.204
	4:30	0.000	0.051	1.279
	4:35	0.000	0.058	1.356
	4:40	0.000	0.066	1.435
	4:45	0.000	0.075	1.518
	4:50	0.000	0.084	1.603
	4:55	0.000	0.094	1.692
	5:00	0.000	0.105	1.783
	5:05	0.000	0.118	1.876
	5:10	0.000	0.131	1.973
	5:15	0.000	0.145	2.073
	5:20	0.000	0.161	2.175
	5:25	0.000	0.178	2.280
	5:30	0.000	0.196	2.388
	5:35	0.000	0.215	2.499
	5:40	0.000	0.236	2.612
	5:45	0.000	0.258	2.729
	5:50	0.000	0.281	2.848
	5:55	0.000	0.307	2.970
	6:00	0.000	0.333	3.095
	6:05	0.000	0.362	3.223
	6:10	0.000	0.392	3.353
	6:15	0.000	0.424	3.487
	6:20	0.000	0.458	3.622
	6:25	0.000	0.493	3.761
	6:30	0.000	0.531	3.902
	6:35	0.000	0.570	4.046
	6:40	0.001	0.612	4.193
	6:45	0.001	0.655	4.342
	6:50	0.001	0.701	4.493
	6:55	0.002	0.749	4.647
	7:00	0.002	0.798	4.804
	7:05	0.003	0.850	4.963
	7:10	0.004	0.904	5.125
	7:15	0.005	0.960	5.289
	7:20	0.006	1.019	5.456
	7:25	0.007	1.079	5.624
	7:30	0.009	1.142	5.795
	7:35	0.011	1.207	5.968
	7:40	0.013	1.274	6.144
	7:45	0.015	1.344	6.322
	7:50	0.018	1.416	6.502
	7:55	0.021	1.489	6.684
	8:00	0.024	1.566	6.869
	8:05	0.028	1.644	7.055
	8:10	0.033	1.724	7.243
	8:15	0.037	1.807	7.434
	8:20	0.043	1.892	7.626
	8:25	0.048	1.979	7.821
	8:30	0.055	2.069	8.017
	8:35	0.062	2.160	8.215
	8:40	0.069	2.254	8.415
	8:45	0.078	2.350	8.617
	8:50	0.086	2.447	8.819
	8:55	0.096	2.546	9.022
	9:00	0.106	2.647	9.226
	9:05	0.117	2.749	9.430
	9:10	0.128	2.853	9.635
	9:15	0.141	2.958	9.841
	9:20	0.154	3.065	10.047
	9:25	0.167	3.172	10.252
	9:30	0.182	3.281	10.456
	9:35	0.197	3.390	10.659
	9:40	0.213	3.499	10.861
	9:45	0.229	3.609	11.062
	9:50	0.246	3.720	11.262
	9:55	0.264	3.831	11.461
	10:00	0.282	3.943	11.657
	10:05	0.302	4.054	11.852
	10:10	0.322	4.166	12.045
	10:15	0.343	4.278	12.236
	10:20	0.364	4.389	12.425
	10:25	0.387	4.501	12.612
	10:30	0.409	4.612	12.796
	10:35	0.433	4.722	12.977
	10:40	0.457	4.831	13.154
	10:45	0.482	4.940	13.328
	10:50	0.507	5.048	13.499
	10:55	0.533	5.154	13.666
	11:00	0.560	5.260	13.830
	11:05	0.586	5.364	13.989
	11:10	0.614	5.466	14.142
	11:15	0.641	5.566	14.291
	11:20	0.669	5.663	14.435
	11:25	0.697	5.759	14.574
	11:30	0.725	5.853	14.707
	11:35	0.754	5.943	14.835
	11:40	0.782	6.032	14.956
	11:45	0.811	6.117	15.071
	11:50	0.839	6.199	15.179
	11:55	0.867	6.278	15.281

Masaka Hydrographs

	Time	100-Year	1000-Year	10000-Year
Day1	12:00	0.001	0.701	3.351
	12:05	0.001	0.714	3.395
	12:10	0.001	0.728	3.400
	12:15	0.001	0.742	3.434
	12:20	0.001	0.755	3.469
	12:25	0.001	0.770	3.503
	12:30	0.001	0.784	3.538
	12:35	0.001	0.798	3.573
	12:40	0.002	0.812	3.608
	12:45	0.002	0.826	3.642
	12:50	0.002	0.841	3.677
	12:55	0.002	0.855	3.712
	13:00	0.003	0.870	3.747
	13:05	0.003	0.885	3.782
	13:10	0.003	0.899	3.818
	13:15	0.003	0.914	3.853
	13:20	0.004	0.929	3.889
	13:25	0.004	0.944	3.925
	13:30	0.005	0.959	3.961
	13:35	0.005	0.975	3.998
	13:40	0.006	0.990	4.035
	13:45	0.006	1.005	4.072
	13:50	0.007	1.021	4.109
	13:55	0.007	1.037	4.147
	14:00	0.008	1.052	4.185
	14:05	0.009	1.068	4.223
	14:10	0.009	1.084	4.262
	14:15	0.010	1.100	4.301
	14:20	0.011	1.117	4.340
	14:25	0.012	1.133	4.380
	14:30	0.013	1.149	4.420
	14:35	0.014	1.166	4.460
	14:40	0.015	1.182	4.501
	14:45	0.016	1.199	4.543
	14:50	0.017	1.216	4.584
	14:55	0.018	1.232	4.626
	15:00	0.019	1.249	4.669
	15:05	0.020	1.266	4.712
	15:10	0.022	1.284	4.756
	15:15	0.023	1.301	4.801
	15:20	0.025	1.319	4.846
	15:25	0.026	1.336	4.892
	15:30	0.028	1.354	4.938
	15:35	0.030	1.372	4.986
	15:40	0.032	1.391	5.034
	15:45	0.033	1.409	5.082
	15:50	0.035	1.428	5.131
	15:55	0.038	1.446	5.180
	16:00	0.040	1.465	5.229
	16:05	0.042	1.485	5.264
	16:10	0.044	1.504	5.336
	16:15	0.047	1.524	5.389
	16:20	0.050	1.543	5.443
	16:25	0.052	1.564	5.498
	16:30	0.055	1.584	5.553
	16:35	0.058	1.604	5.610
	16:40	0.061	1.625	5.667
	16:45	0.064	1.646	5.724
	16:50	0.067	1.668	5.783
	16:55	0.071	1.689	5.843
	17:00	0.074	1.711	5.903
	17:05	0.078	1.734	5.964
	17:10	0.082	1.756	6.026
	17:15	0.086	1.779	6.089
	17:20	0.090	1.802	6.153
	17:25	0.094	1.826	6.218
	17:30	0.098	1.850	6.284
	17:35	0.103	1.874	6.350
	17:40	0.107	1.899	6.418
	17:45	0.112	1.924	6.487
	17:50	0.117	1.949	6.556
	17:55	0.122	1.975	6.627
	18:00	0.128	2.001	6.698
	18:05	0.133	2.028	6.771
	18:10	0.139	2.055	6.845
	18:15	0.145	2.082	6.920
	18:20	0.150	2.110	6.995
	18:25	0.157	2.139	7.072
	18:30	0.163	2.167	7.150
	18:35	0.170	2.197	7.230
	18:40	0.176	2.227	7.310
	18:45	0.183	2.257	7.392
	18:50	0.190	2.288	7.474
	18:55	0.198	2.319	7.559
	19:00	0.205	2.351	7.644
	19:05	0.213	2.384	7.730
	19:10	0.221	2.417	7.818
	19:15	0.229	2.451	7.907
	19:20	0.238	2.485	7.997
	19:25	0.246	2.520	8.089
	19:30	0.255	2.555	8.182
	19:35	0.264	2.592	8.276
	19:40	0.274	2.628	8.371
	19:45	0.283	2.666	8.467
	19:50	0.293	2.703	8.565
	19:55	0.303	2.742	8.664
	20:00	0.313	2.781	8.765
	20:05	0.324	2.821	8.866
	20:10	0.335	2.862	8.969
	20:15	0.346	2.903	9.074
	20:20	0.358	2.945	9.179
	20:25	0.369	2.987	9.286
	20:30	0.381	3.030	9.394
	20:35	0.393	3.074	9.504
	20:40	0.406	3.119	9.614
	20:45	0.419	3.164	9.726
	20:50	0.432	3.210	9.839
	20:55	0.445	3.257	9.953
	21:00	0.459	3.304	10.069
	21:05	0.472	3.353	10.186
	21:10	0.487	3.402	10.304
	21:15	0.501	3.452	10.424
	21:20	0.516	3.502	10.545
	21:25	0.531	3.554	10.667
	21:30	0.546	3.606	10.790
	21:35	0.562	3.659	10.915
	21:40	0.577	3.713	11.041
	21:45	0.594	3.768	11.169
	21:50	0.610	3.823	11.298
	21:55	0.627	3.880	11.428
	22:00	0.644	3.937	11.560
	22:05	0.662	3.995	11.693
	22:10	0.680	4.055	11.827
	22:15	0.698	4.115	11.963
	22:20	0.717	4.176	12.100
	22:25	0.736	4.238	12.239
	22:30	0.755	4.301	12.379
	22:35	0.775	4.365	12.520
	22:40	0.795	4.429	12.663
	22:45	0.816	4.495	12.808
	22:50	0.837	4.562	12.954
	22:55	0.858	4.630	13.101
	23:00	0.880	4.699	13.250
	23:05	0.902	4.769	13.400
	23:10	0.926	4.839	13.552
	23:15	0.948	4.911	13.704
	23:20	0.972	4.984	13.859
	23:25	0.995	5.057	14.014
	23:30	1.020	5.132	14.171
	23:35	1.044	5.208	14.329
	23:40	1.070	5.284	14.489
	23:45	1.095	5.362	14.650
	23:50	1.121	5.440	14.812
	23:55	1.148	5.520	14.976

Masaka Hydrographs

	Time	100-Year	1000-Year	10000-Year
Day2	0:00	1.175	5.600	15.141
	0:05	1.202	5.682	15.308
	0:10	1.230	5.764	15.475
	0:15	1.258	5.848	15.644
	0:20	1.287	5.932	15.814
	0:25	1.316	6.017	15.985
	0:30	1.346	6.104	16.159
	0:35	1.376	6.191	16.333
	0:40	1.407	6.280	16.509
	0:45	1.438	6.369	16.686
	0:50	1.470	6.459	16.864
	0:55	1.502	6.551	17.044
	1:00	1.534	6.643	17.225
	1:05	1.567	6.737	17.408
	1:10	1.601	6.832	17.592
	1:15	1.635	6.927	17.777
	1:20	1.670	7.024	17.964
	1:25	1.705	7.122	18.152
	1:30	1.741	7.221	18.342
	1:35	1.778	7.322	18.533
	1:40	1.815	7.423	18.726
	1:45	1.852	7.526	18.921
	1:50	1.891	7.630	19.117
	1:55	1.929	7.735	19.315
	2:00	1.969	7.841	19.514
	2:05	2.010	7.950	19.717
	2:10	2.052	8.062	19.924
	2:15	2.096	8.177	20.136
	2:20	2.141	8.294	20.351
	2:25	2.188	8.415	20.571
	2:30	2.237	8.538	20.795
	2:35	2.287	8.665	21.024
	2:40	2.340	8.795	21.255
	2:45	2.394	8.929	21.492
	2:50	2.450	9.067	21.741
	2:55	2.508	9.208	21.990
	3:00	2.570	9.355	22.243
	3:05	2.634	9.508	22.514
	3:10	2.702	9.667	22.788
	3:15	2.774	9.832	23.074
	3:20	2.850	10.004	23.388
	3:25	2.929	10.184	23.673
	3:30	3.013	10.370	23.988
	3:35	3.102	10.565	24.315
	3:40	3.195	10.768	24.653
	3:45	3.293	10.979	25.003
	3:50	3.397	11.199	25.367
	3:55	3.507	11.430	25.745
	4:00	3.623	11.673	26.140
	4:05	3.749	11.929	26.555
	4:10	3.883	12.202	26.993
	4:15	4.028	12.491	27.454
	4:20	4.184	12.797	27.940
	4:25	4.352	13.123	28.453
	4:30	4.532	13.469	28.995
	4:35	4.729	13.841	29.572
	4:40	4.943	14.240	30.187
	4:45	5.177	14.671	30.845
	4:50	5.432	15.133	31.547
	4:55	5.711	15.634	32.302
	5:00	6.031	16.196	33.142
	5:05	6.441	16.891	34.169
	5:10	6.887	17.640	35.248
	5:15	7.365	18.435	36.401
	5:20	7.876	19.281	37.621
	5:25	8.421	20.177	38.911
	5:30	9.002	21.126	40.269
	5:35	9.618	22.127	41.698
	5:40	10.269	23.182	43.200
	5:45	10.957	24.291	44.775
	5:50	11.690	25.458	46.440
	5:55	12.491	26.743	48.241
	6:00	13.405	28.184	50.261
	6:05	14.465	29.804	52.372
	6:10	15.367	31.263	54.562
	6:15	16.412	32.895	56.835
	6:20	17.497	34.586	59.187
	6:25	18.624	36.336	61.617
	6:30	19.797	38.141	64.121
	6:35	20.989	40.001	66.697
	6:40	22.228	41.916	69.348
	6:45	23.509	43.884	72.082
	6:50	24.820	45.901	74.931
	6:55	26.161	48.124	77.915
	7:00	27.711	50.348	80.977
	7:05	29.199	52.627	84.112
	7:10	30.726	54.961	87.320
	7:15	32.291	57.352	90.604
	7:20	33.895	59.801	93.965
	7:25	35.539	62.307	97.402
	7:30	37.221	64.868	100.912
	7:35	38.943	67.487	104.499
	7:40	40.714	70.177	108.180
	7:45	42.563	72.981	112.013
	7:50	44.493	75.900	115.999
	7:55	46.469	78.888	120.072
	8:00	48.490	81.938	124.229
	8:05	50.552	85.049	128.466
	8:10	52.658	88.221	132.783
	8:15	54.807	91.456	137.181
	8:20	56.999	94.751	141.660
	8:25	59.232	98.104	146.215
	8:30	61.508	101.519	150.849
	8:35	63.840	105.014	155.599
	8:40	66.274	108.665	160.522
	8:45	68.791	112.414	165.607
	8:50	71.355	116.237	170.776
	8:55	73.962	120.121	176.024
	9:00	76.610	124.062	181.343
	9:05	79.298	128.057	186.732
	9:10	82.024	132.104	192.188
	9:15	84.795	136.200	197.705
	9:20	87.579	140.341	203.279
	9:25	90.408	144.528	208.911
	9:30	93.279	148.772	214.615
	9:35	96.230	153.128	220.464
	9:40	99.228	157.547	226.391
	9:45	102.252	161.999	232.398
	9:50	105.299	166.479	238.357
	9:55	108.365	170.982	244.392
	10:00	111.446	175.500	250.422
	10:05	114.544	180.036	256.464
	10:10	117.626	184.563	262.510
	10:15	120.724	189.076	268.544
	10:20	123.817	193.593	274.550
	10:25	126.890	198.093	280.524
	10:30	129.897	202.451	286.347
	10:35	132.877	206.788	292.108
	10:40	135.839	211.089	297.823
	10:45	138.778	215.356	303.486
	10:50	141.693	219.592	309.099
	10:55	144.579	223.762	314.628
	11:00	147.437	227.896	320.103
	11:05	150.263	231.981	325.505
	11:10	153.059	236.017	330.841
	11:15	155.815	239.990	336.099
	11:20	158.504	243.862	341.196
	11:25	161.063	247.536	346.024
	11:30	163.557	251.113	350.748
	11:35	166.005	254.634	355.390
	11:40	168.411	258.081	359.913
	11:45	170.767	261.455	364.345
	11:50	173.073	264.752	368.673
	11:55	175.330	267.976	372.901

Masaka Hydrographs

	Time	100-Year	1000-Year	10000-Year
Day2	12:00	177.537	271.126	377.027
	12:05	179.694	274.199	381.048
	12:10	181.790	277.179	384.945
	12:15	183.789	280.017	388.648
	12:20	185.647	282.648	392.072
	12:25	187.441	285.182	395.370
	12:30	189.179	287.633	398.555
	12:35	190.856	289.996	401.619
	12:40	192.473	292.269	404.564
	12:45	194.028	294.453	407.388
	12:50	195.525	296.549	410.095
	12:55	196.963	298.559	412.685
	13:00	198.341	300.481	415.157
	13:05	199.648	302.297	417.488
	13:10	200.841	303.948	419.597
	13:15	201.902	305.405	421.448
	13:20	202.897	306.788	423.175
	13:25	203.831	308.043	424.785
	13:30	204.707	309.233	426.282
	13:35	205.538	310.343	427.672
	13:40	206.294	311.373	428.957
	13:45	207.009	312.331	430.144
	13:50	207.675	313.216	431.236
	13:55	208.291	314.029	432.231
	14:00	208.850	314.759	433.116
	14:05	209.332	315.376	433.850
	14:10	209.740	315.895	434.441
	14:15	210.099	316.324	434.936
	14:20	210.426	316.690	435.336
	14:25	210.673	316.991	435.648
	14:30	210.890	317.223	435.868
	14:35	211.060	317.395	435.996
	14:40	211.182	317.476	436.028
	14:45	211.255	317.497	435.965
	14:50	211.276	317.441	435.801
	14:55	211.230	317.286	435.504
	15:00	211.055	316.946	434.960
	15:05	210.786	316.468	434.234
	15:10	210.450	315.918	433.403
	15:15	210.081	315.275	432.472
	15:20	209.653	314.572	431.450
	15:25	209.180	313.803	430.342
	15:30	208.664	312.974	429.154
	15:35	208.109	312.088	427.893
	15:40	207.515	311.147	426.559
	15:45	206.884	310.152	425.154
	15:50	206.211	309.098	423.669
	15:55	205.483	307.964	422.081
	16:00	204.716	306.775	420.420
	16:05	203.918	305.541	418.699
	16:10	203.090	304.266	416.923
	16:15	202.236	302.951	415.097
	16:20	201.356	301.600	413.221
	16:25	200.450	300.212	411.296
	16:30	199.520	298.788	409.327
	16:35	198.565	297.330	407.310
	16:40	197.586	295.836	405.246
	16:45	196.576	294.296	403.125
	16:50	195.521	292.695	400.917
	16:55	194.438	291.052	398.657
	17:00	193.329	289.373	396.349
	17:05	192.196	287.656	393.996
	17:10	191.039	285.910	391.598
	17:15	189.858	284.127	389.153
	17:20	188.652	282.309	386.662
	17:25	187.422	280.455	384.125
	17:30	186.167	278.568	381.545
	17:35	184.886	276.642	378.914
	17:40	183.585	274.680	376.238
	17:45	182.181	272.587	373.384
	17:50	180.767	270.474	370.505
	17:55	179.327	268.321	367.580
	18:00	177.862	266.136	364.610
	18:05	176.375	263.920	361.602
	18:10	174.867	261.674	358.555
	18:15	173.337	259.399	355.473
	18:20	171.787	257.095	352.362
	18:25	170.217	254.765	349.233
	18:30	168.625	252.402	346.114
	18:35	166.996	249.988	343.005
	18:40	165.317	247.506	339.441
	18:45	163.619	244.997	339.398
	18:50	161.905	242.469	343.048
	18:55	160.176	239.923	355.324
	19:00	158.439	237.363	378.222
	19:05	156.692	234.794	411.597
	19:10	154.940	232.221	453.819
	19:15	153.185	229.645	502.701
	19:20	151.428	227.070	556.075
	19:25	149.676	224.505	612.065
	19:30	147.950	221.980	669.202
	19:35	146.255	219.503	726.341
	19:40	144.571	217.044	782.591
	19:45	142.897	214.601	837.356
	19:50	141.236	212.178	890.243
	19:55	139.588	209.777	941.014
	20:00	137.954	207.398	989.547
	20:05	136.334	205.042	1035.828
	20:10	134.730	202.713	1079.831
	20:15	133.142	200.416	1121.698
	20:20	131.581	198.176	1161.540
	20:25	130.079	196.073	1199.558
	20:30	128.637	194.107	1235.882
	20:35	127.197	192.756	1270.618
	20:40	125.787	192.796	1303.927
	20:45	124.398	196.833	1335.974
	20:50	123.029	215.842	1366.923
	20:55	121.680	244.196	1396.928
	21:00	120.347	282.110	1426.136
	21:05	119.031	326.652	1454.694
	21:10	117.732	375.156	1482.744
	21:15	116.453	425.503	1510.428
	21:20	115.207	476.114	1537.896
	21:25	113.984	526.930	1565.247
	21:30	112.775	573.957	1592.579
	21:35	111.581	619.667	1619.936
	21:40	110.403	663.019	1647.393
	21:45	109.241	703.697	1675.464
	21:50	108.094	741.676	1703.687
	21:55	106.962	776.983	1732.338
	22:00	105.845	809.703	1761.484
	22:05	104.744	839.910	1791.185
	22:10	103.663	867.862	1821.504
	22:15	102.617	893.663	1852.513
	22:20	101.591	917.434	1884.222
	22:25	100.587	939.241	1916.664
	22:30	99.599	959.587	1949.828
	22:35	98.610	978.242	1983.758
	22:40	97.648	995.518	2018.453
	22:45	96.704	1011.537	2053.912
	22:50	95.780	1026.436	2090.127
	22:55	94.895	1040.338	2127.081
	23:00	94.072	1053.363	2164.756
	23:05	93.390	1065.636	2203.133
	23:10	93.035	1077.290	2242.219
	23:15	93.667	1088.385	2281.920
	23:20	98.650	1099.009	2322.185
	23:25	114.665	1109.245	2362.959
	23:30	141.697	1119.177	2404.181
	23:35	174.188	1128.881	2445.789
	23:40	212.040	1138.381	2487.715
	23:45	251.861	1147.798	2529.892
	23:50	291.920	1157.172	2572.249
	23:55	331.038	1166.561	2614.715

Masaka Hydrographs

Day	Time	100-Year	1000-Year	10000-Year
Day 3	0:00	368.452	1176.021	2657.219
	0:05	403.699	1185.602	2699.689
	0:10	436.528	1195.352	2742.051
	0:15	466.839	1205.316	2784.235
	0:20	494.627	1215.538	2826.170
	0:25	519.959	1226.059	2867.789
	0:30	542.941	1236.918	2909.029
	0:35	563.708	1248.153	2949.829
	0:40	582.405	1259.799	2990.130
	0:45	599.184	1271.889	3029.877
	0:50	614.200	1284.454	3069.021
	0:55	627.602	1297.531	3107.524
	1:00	639.538	1311.149	3145.348
	1:05	650.128	1325.319	3182.438
	1:10	659.498	1340.060	3218.754
	1:15	667.762	1355.388	3254.264
	1:20	675.026	1371.315	3288.939
	1:25	681.388	1387.853	3322.752
	1:30	686.936	1405.006	3355.683
	1:35	691.752	1422.779	3387.714
	1:40	695.911	1441.171	3418.832
	1:45	699.480	1460.178	3449.025
	1:50	702.521	1479.792	3478.289
	1:55	705.090	1500.000	3506.616
	2:00	707.237	1520.786	3534.006
	2:05	709.008	1542.129	3560.459
	2:10	710.445	1564.005	3585.975
	2:15	711.586	1586.386	3610.562
	2:20	712.467	1609.243	3634.227
	2:25	713.121	1632.541	3656.980
	2:30	713.576	1656.245	3678.832
	2:35	713.861	1680.316	3699.796
	2:40	714.004	1704.717	3719.890
	2:45	714.038	1729.419	3739.152
	2:50	713.982	1754.373	3757.585
	2:55	713.846	1779.519	3775.190
	3:00	713.649	1804.809	3791.981
	3:05	713.408	1830.198	3807.976
	3:10	713.139	1855.637	3823.190
	3:15	712.858	1881.078	3837.638
	3:20	712.579	1906.475	3851.339
	3:25	712.316	1931.784	3864.309
	3:30	712.084	1956.961	3876.566
	3:35	711.896	1981.965	3888.128
	3:40	711.766	2006.756	3899.013
	3:45	711.707	2031.296	3909.235
	3:50	711.732	2055.549	3918.813
	3:55	711.854	2079.481	3927.763
	4:00	712.086	2103.062	3936.101
	4:05	712.441	2126.264	3943.843
	4:10	712.935	2149.061	3951.007
	4:15	713.580	2171.430	3957.609
	4:20	714.392	2193.352	3963.663
	4:25	715.386	2214.808	3969.186
	4:30	716.577	2235.786	3974.195
	4:35	717.990	2256.282	3978.720
	4:40	719.632	2276.274	3982.760
	4:45	721.518	2295.751	3986.323
	4:50	723.664	2314.705	3989.424
	4:55	726.087	2333.131	3992.074
	5:00	728.803	2351.025	3994.285
	5:05	731.828	2368.385	3996.068
	5:10	735.181	2385.210	3997.436
	5:15	738.879	2401.501	3998.397
	5:20	742.937	2417.260	3998.964
	5:25	747.373	2432.492	3999.147
	5:30	752.203	2447.200	3998.956
	5:35	757.441	2461.390	3998.400
	5:40	763.103	2475.067	3997.487
	5:45	769.200	2488.237	3996.227
	5:50	775.745	2500.908	3994.627
	5:55	782.749	2513.089	3992.697
	6:00	790.221	2524.788	3990.447
	6:05	798.167	2536.015	3987.885
	6:10	806.594	2546.778	3985.019
	6:15	815.502	2557.089	3981.858
	6:20	824.896	2566.960	3978.415
	6:25	834.775	2576.407	3974.703
	6:30	845.128	2585.429	3970.719
	6:35	855.946	2594.035	3966.468
	6:40	867.218	2602.236	3961.957
	6:45	878.929	2610.039	3957.192
	6:50	891.063	2617.455	3952.180
	6:55	903.601	2624.492	3946.926
	7:00	916.520	2631.158	3941.437
	7:05	929.796	2637.462	3935.719
	7:10	943.404	2643.414	3929.778
	7:15	957.315	2649.021	3923.620
	7:20	971.500	2654.292	3917.251
	7:25	985.928	2659.234	3910.676
	7:30	1000.568	2663.854	3903.900
	7:35	1015.387	2668.160	3896.928
	7:40	1030.352	2672.159	3889.767
	7:45	1045.431	2675.858	3882.421
	7:50	1060.593	2679.265	3874.898
	7:55	1075.805	2682.387	3867.202
	8:00	1091.036	2685.231	3859.339
	8:05	1106.257	2687.803	3851.316
	8:10	1121.442	2690.115	3843.144
	8:15	1136.564	2692.173	3834.828
	8:20	1151.591	2693.976	3826.365
	8:25	1166.500	2695.531	3817.761
	8:30	1181.266	2696.842	3809.018
	8:35	1195.868	2697.914	3800.142
	8:40	1210.286	2698.752	3791.136
	8:45	1224.502	2699.362	3782.007
	8:50	1238.501	2699.748	3772.757
	8:55	1252.266	2699.914	3763.392
	9:00	1265.786	2699.867	3753.915
	9:05	1279.049	2699.609	3744.330
	9:10	1292.045	2699.146	3734.642
	9:15	1304.767	2698.481	3724.854
	9:20	1317.207	2697.619	3714.970
	9:25	1329.360	2696.563	3704.992
	9:30	1341.223	2695.317	3694.926
	9:35	1352.793	2693.887	3684.776
	9:40	1364.068	2692.277	3674.545
	9:45	1375.048	2690.491	3664.237
	9:50	1385.733	2688.532	3653.857
	9:55	1396.126	2686.406	3643.408
	10:00	1406.230	2684.121	3632.900
	10:05	1416.047	2681.677	3622.331
	10:10	1425.577	2679.076	3611.703
	10:15	1434.825	2676.322	3601.018
	10:20	1443.795	2673.419	3590.279
	10:25	1452.490	2670.370	3579.489
	10:30	1460.915	2667.177	3568.651
	10:35	1469.074	2663.844	3557.766
	10:40	1476.973	2660.376	3546.838
	10:45	1484.617	2656.774	3535.869
	10:50	1492.011	2653.043	3524.861
	10:55	1499.160	2649.186	3513.818
	11:00	1506.069	2645.206	3502.742
	11:05	1512.744	2641.106	3491.635
	11:10	1519.189	2636.890	3480.499
	11:15	1525.410	2632.561	3469.337
	11:20	1531.412	2628.122	3458.150
	11:25	1537.199	2623.575	3446.940
	11:30	1542.776	2618.923	3435.709
	11:35	1548.148	2614.170	3424.460
	11:40	1553.319	2609.320	3413.194
	11:45	1558.295	2604.375	3401.915
	11:50	1563.081	2599.342	3390.630
	11:55	1567.680	2594.221	3379.334

Masaka Hydrographs

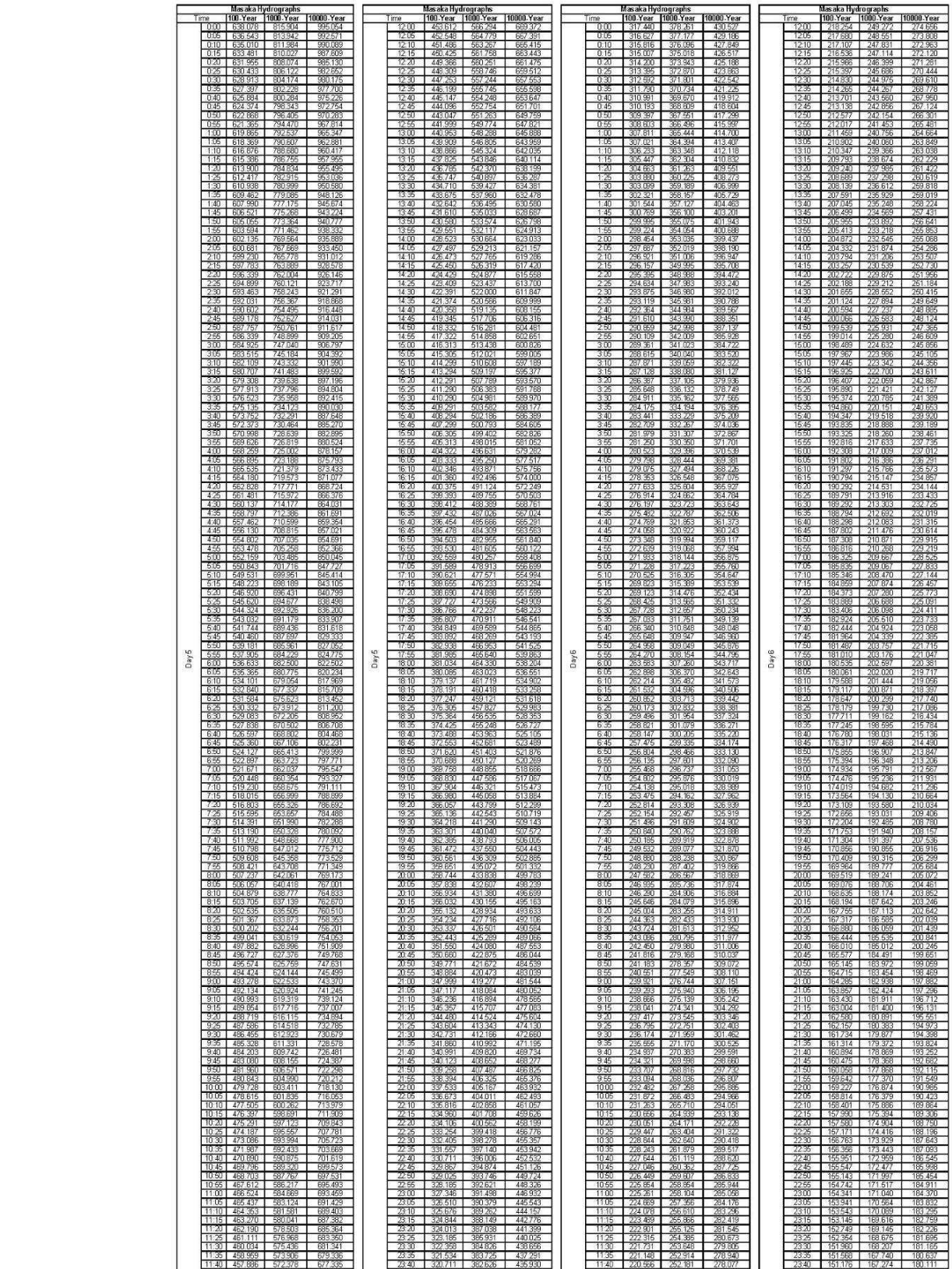
Day	Time	100-Year	1000-Year	10000-Year
Day 3	12:00	1572.095	2589.013	3368.030
	12:05	1576.330	2583.722	3356.719
	12:10	1580.388	2578.350	3345.403
	12:15	1584.273	2572.901	3334.083
	12:20	1587.987	2567.375	3322.760
	12:25	1591.533	2561.775	3311.435
	12:30	1594.915	2556.103	3300.109
	12:35	1598.135	2550.364	3288.785
	12:40	1601.196	2544.558	3277.463
	12:45	1604.101	2538.689	3266.146
	12:50	1606.852	2532.758	3254.835
	12:55	1609.453	2526.769	3243.530
	13:00	1611.904	2520.723	3232.233
	13:05	1614.209	2514.623	3220.946
	13:10	1616.370	2508.470	3209.669
	13:15	1618.388	2502.267	3198.403
	13:20	1620.266	2496.016	3187.150
	13:25	1622.006	2489.718	3175.909
	13:30	1623.609	2483.376	3164.684
	13:35	1625.080	2476.994	3153.477
	13:40	1626.420	2470.573	3142.289
	13:45	1627.630	2464.115	3131.119
	13:50	1628.712	2457.621	3119.969
	13:55	1629.668	2451.093	3108.839
	14:00	1630.500	2444.533	3097.730
	14:05	1631.210	2437.941	3086.643
	14:10	1631.799	2431.320	3075.578
	14:15	1632.269	2424.672	3064.536
	14:20	1632.622	2417.997	3053.519
	14:25	1632.861	2411.299	3042.527
	14:30	1632.986	2404.577	3031.560
	14:35	1633.001	2397.835	3020.621
	14:40	1632.906	2391.073	3009.709
	14:45	1632.705	2384.292	2998.825
	14:50	1632.397	2377.495	2987.970
	14:55	1631.987	2370.683	2977.145
	15:00	1631.475	2363.855	2966.349
	15:05	1630.862	2357.015	2955.583
	15:10	1630.152	2350.161	2944.848
	15:15	1629.346	2343.298	2934.145
	15:20	1628.445	2336.425	2923.474
	15:25	1627.455	2329.546	2912.838
	15:30	1626.375	2322.661	2902.238
	15:35	1625.208	2315.770	2891.671
	15:40	1623.954	2308.874	2881.139
	15:45	1622.616	2301.974	2870.642
	15:50	1621.197	2295.072	2860.181
	15:55	1619.697	2288.168	2849.754
	16:00	1618.119	2281.262	2839.364
	16:05	1616.464	2274.356	2829.010
	16:10	1614.735	2267.451	2818.692
	16:15	1612.933	2260.548	2808.412
	16:20	1611.061	2253.647	2798.169
	16:25	1609.119	2246.750	2787.964
	16:30	1607.111	2239.856	2777.797
	16:35	1605.038	2232.968	2767.668
	16:40	1602.902	2226.085	2757.577
	16:45	1600.704	2219.208	2747.526
	16:50	1598.447	2212.339	2737.514
	16:55	1596.132	2205.477	2727.541
	17:00	1593.761	2198.623	2717.608
	17:05	1591.336	2191.779	2707.715
	17:10	1588.858	2184.945	2697.863
	17:15	1586.332	2178.124	2688.055
	17:20	1583.756	2171.314	2678.288
	17:25	1581.133	2164.516	2668.561
	17:30	1578.465	2157.730	2658.876
	17:35	1575.752	2150.956	2649.231
	17:40	1572.996	2144.196	2639.628
	17:45	1570.199	2137.449	2630.065
	17:50	1567.361	2130.715	2620.543
	17:55	1564.485	2123.994	2611.062
	18:00	1561.571	2117.288	2601.622
	18:05	1558.622	2110.597	2592.223
	18:10	1555.638	2103.921	2582.864
	18:15	1552.621	2097.260	2573.546
	18:20	1549.572	2090.615	2564.269
	18:25	1546.492	2083.986	2555.033
	18:30	1543.383	2077.372	2545.838
	18:35	1540.245	2070.775	2536.683
	18:40	1537.079	2064.195	2527.568
	18:45	1533.888	2057.631	2518.494
	18:50	1530.671	2051.084	2509.459
	18:55	1527.430	2044.554	2500.465
	19:00	1524.166	2038.041	2491.511
	19:05	1520.880	2031.546	2482.597
	19:10	1517.572	2025.069	2473.724
	19:15	1514.245	2018.610	2464.890
	19:20	1510.899	2012.169	2456.096
	19:25	1507.534	2005.746	2447.343
	19:30	1504.153	1999.343	2438.629
	19:35	1500.755	1992.958	2429.956
	19:40	1497.342	1986.593	2421.323
	19:45	1493.915	1980.247	2412.731
	19:50	1490.473	1973.921	2404.178
	19:55	1487.019	1967.615	2395.666
	20:00	1483.553	1961.328	2387.194
	20:05	1480.075	1955.062	2378.762
	20:10	1476.587	1948.815	2370.370
	20:15	1473.088	1942.589	2362.017
	20:20	1469.580	1936.383	2353.705
	20:25	1466.064	1930.197	2345.432
	20:30	1462.539	1924.032	2337.199
	20:35	1459.007	1917.889	2329.006
	20:40	1455.469	1911.766	2320.853
	20:45	1451.924	1905.665	2312.741
	20:50	1448.374	1899.585	2304.668
	20:55	1444.819	1893.526	2296.635
	21:00	1441.259	1887.489	2288.642
	21:05	1437.695	1881.473	2280.688
	21:10	1434.127	1875.479	2272.774
	21:15	1430.556	1869.506	2264.899
	21:20	1426.983	1863.554	2257.063
	21:25	1423.407	1857.625	2249.267
	21:30	1419.830	1851.717	2241.511
	21:35	1416.251	1845.831	2233.793
	21:40	1412.671	1839.967	2226.115
	21:45	1409.091	1834.126	2218.477
	21:50	1405.510	1828.306	2210.878
	21:55	1401.929	1822.509	2203.317
	22:00	1398.349	1816.733	2195.796
	22:05	1394.770	1810.979	2188.313
	22:10	1391.191	1805.247	2180.868
	22:15	1387.613	1799.538	2173.462
	22:20	1384.037	1793.850	2166.095
	22:25	1380.463	1788.184	2158.766
	22:30	1376.891	1782.541	2151.475
	22:35	1373.321	1776.919	2144.222
	22:40	1369.753	1771.319	2137.006
	22:45	1366.188	1765.742	2129.829
	22:50	1362.626	1760.186	2122.689
	22:55	1359.068	1754.652	2115.587
	23:00	1355.512	1749.140	2108.522
	23:05	1351.960	1743.650	2101.495
	23:10	1348.412	1738.182	2094.505
	23:15	1344.868	1732.737	2087.552
	23:20	1341.328	1727.313	2080.637
	23:25	1337.793	1721.912	2073.759
	23:30	1334.262	1716.533	2066.918
	23:35	1330.736	1711.176	2060.113
	23:40	1327.215	1705.841	2053.346
	23:45	1323.699	1700.528	2046.616
	23:50	1320.188	1695.237	2039.922
	23:55	1316.682	1689.969	2033.264

Masaka Hydrographs

Day	Time	100-Year	1000-Year	10000-Year
Day 4	0:00	1313.182	1684.722	2026.643
	0:05	1309.688	1679.498	2020.058
	0:10	1306.199	1674.295	2013.508
	0:15	1302.716	1669.114	2006.995
	0:20	1299.238	1663.956	2000.518
	0:25	1295.767	1658.819	1994.076
	0:30	1292.303	1653.704	1987.670
	0:35	1288.844	1648.611	1981.299
	0:40	1285.392	1643.541	1974.964
	0:45	1281.946	1638.491	1968.664
	0:50	1278.507	1633.464	1962.398
	0:55	1275.074	1628.459	1956.168
	1:00	1271.649	1623.475	1949.972
	1:05	1268.230	1618.514	1943.811
	1:10	1264.819	1613.574	1937.685
	1:15	1261.414	1608.656	1931.594
	1:20	1258.017	1603.761	1925.537
	1:25	1254.628	1598.887	1919.514
	1:30	1251.246	1594.035	1913.526
	1:35	1247.871	1589.205	1907.572
	1:40	1244.505	1584.397	1901.653
	1:45	1241.146	1579.612	1895.767
	1:50	1237.795	1574.848	1889.915
	1:55	1234.452	1570.106	1884.098
	2:00	1231.118	1565.387	1878.314
	2:05	1227.792	1560.690	1872.565
	2:10	1224.474	1556.015	1866.849
	2:15	1221.167	1551.365	1861.170
	2:20	1217.869	1546.738	1855.526
	2:25	1214.580	1542.134	1849.917
	2:30	1211.300	1537.552	1844.340
	2:35	1208.029	1532.992	1838.797
	2:40	1204.766	1528.454	1833.286
	2:45	1201.513	1523.938	1827.809
	2:50	1198.269	1519.444	1822.364
	2:55	1195.034	1514.972	1816.951
	3:00	1191.808	1510.522	1811.571
	3:05	1188.591	1506.094	1806.223
	3:10	1185.383	1501.688	1800.907
	3:15	1182.185	1497.303	1795.622
	3:20	1178.996	1492.939	1790.369
	3:25	1175.816	1488.597	1785.147
	3:30	1172.646	1484.277	1779.956
	3:35	1169.485	1479.978	1774.796
	3:40	1166.333	1475.700	1769.667
	3:45	1163.191	1471.444	1764.569
	3:50	1160.059	1467.208	1759.500
	3:55	1156.936	1462.994	1754.463
	4:00	1153.823	1458.801	1749.455
	4:05	1150.720	1454.630	1744.477
	4:10	1147.626	1450.479	1739.529
	4:15	1144.542	1446.349	1734.611
	4:20	1141.468	1442.240	1729.723
	4:25	1138.405	1438.153	1724.863
	4:30	1135.351	1434.086	1720.034
	4:35	1132.307	1430.040	1715.233
	4:40	1129.273	1426.015	1710.461
	4:45	1126.250	1422.010	1705.718
	4:50	1123.237	1418.027	1701.004
	4:55	1120.235	1414.064	1696.319
	5:00	1117.242	1410.122	1691.662
	5:05	1114.260	1406.200	1687.033
	5:10	1111.288	1402.298	1682.431
	5:15	1108.326	1398.415	1677.856
	5:20	1105.374	1394.553	1673.308
	5:25	1102.431	1390.710	1668.786
	5:30	1099.499	1386.886	1664.291
	5:35	1096.578	1383.082	1659.823
	5:40	1093.666	1379.298	1655.381
	5:45	1090.765	1375.532	1650.964
	5:50	1087.873	1371.787	1646.574
	5:55	1084.992	1368.060	1642.210
	6:00	1082.121	1364.351	1637.870
	6:05	1079.260	1360.661	1633.554
	6:10	1076.408	1356.989	1629.262
	6:15	1073.566	1353.335	1624.995
	6:20	1070.734	1349.700	1620.751
	6:25	1067.912	1346.082	1616.531
	6:30	1065.100	1342.482	1612.335
	6:35	1062.298	1338.900	1608.163
	6:40	1059.506	1335.336	1604.014
	6:45	1056.723	1331.790	1599.888
	6:50	1053.951	1328.261	1595.785
	6:55	1051.189	1324.749	1591.704
	7:00	1048.436	1321.255	1587.645
	7:05	1045.693	1317.777	1583.609
	7:10	1042.960	1314.316	1579.594
	7:15	1040.237	1310.873	1575.601
	7:20	1037.524	1307.446	1571.630
	7:25	1034.821	1304.035	1567.680
	7:30	1032.127	1300.641	1563.751
	7:35	1029.443	1297.264	1559.843
	7:40	1026.769	1293.903	1555.957
	7:45	1024.105	1290.558	1552.090
	7:50	1021.450	1287.229	1548.244
	7:55	1018.805	1283.915	1544.417
	8:00	1016.169	1280.616	1540.609
	8:05	1013.542	1277.333	1536.821
	8:10	1010.925	1274.065	1533.051
	8:15	1008.318	1270.812	1529.301
	8:20	1005.719	1267.574	1525.570
	8:25	1003.130	1264.352	1521.857
	8:30	1000.551	1261.144	1518.163
	8:35	997.981	1257.950	1514.488
	8:40	995.420	1254.771	1510.829
	8:45	992.867	1251.606	1507.188
	8:50	990.324	1248.454	1503.564
	8:55	987.789	1245.316	1499.956
	9:00	985.263	1242.191	1496.365
	9:05	982.745	1239.080	1492.790
	9:10	980.236	1235.981	1489.230
	9:15	977.735	1232.896	1485.687
	9:20	975.243	1229.823	1482.160
	9:25	972.760	1226.763	1478.648
	9:30	970.285	1223.716	1475.151
	9:35	967.818	1220.681	1471.670
	9:40	965.360	1217.658	1468.202
	9:45	962.909	1214.647	1464.748
	9:50	960.466	1211.647	1461.308
	9:55	958.030	1208.659	1457.882
	10:00	955.603	1205.682	1454.469
	10:05	953.183	1202.716	1451.069
	10:10	950.771	1199.761	1447.683
	10:15	948.367	1196.818	1444.309
	10:20	945.970	1193.885	1440.949
	10:25	943.581	1190.963	1437.601
	10:30	941.200	1188.052	1434.266
	10:35	938.827	1185.152	1430.944
	10:40	936.462	1182.264	1427.635
	10:45	934.105	1179.386	1424.338
	10:50	931.755	1176.519	1421.054
	10:55	929.413	1173.663	1417.783
	11:00	927.079	1170.817	1414.523
	11:05	924.753	1167.982	1411.275
	11:10	922.434	1165.157	1408.039
	11:15	920.123	1162.341	1404.815
	11:20	917.819	1159.536	1401.602
	11:25	915.523	1156.742	1398.401
	11:30	913.235	1153.958	1395.213
	11:35	910.956	1151.186	1392.036
	11:40	908.684	1148.423	1388.872
	11:45	906.421	1145.671	1385.720
	11:50	904.165	1142.929	1382.578
	11:55	901.917	1140.198	1379.449

Masaka Hydrographs

Day	Time	100-Year	1000-Year	10000-Year
Day 4	12:00	899.676	1137.476	1376.330
	12:05	897.443	1134.764	1373.222
	12:10	895.218	1132.061	1370.125
	12:15	893.000	1129.368	1367.039
	12:20	890.791	1126.686	1363.965
	12:25	888.589	1124.014	1360.902
	12:30	886.396	1121.352	1357.850
	12:35	884.210	1118.700	1354.810
	12:40	882.032	1116.057	1351.780
	12:45	879.862	1113.425	1348.761
	12:50	877.700	1110.802	1345.753
	12:55	875.545	1108.188	1342.755
	13:00	873.397	1105.583	1339.767
	13:05	871.257	1102.988	1336.788
	13:10	869.124	1100.401	1333.820
	13:15	866.999	1097.825	1330.863
	13:20	864.883	1095.258	1327.917
	13:25	862.773	1092.701	1324.981
	13:30	860.672	1090.153	1322.055
	13:35	858.578	1087.614	1319.139
	13:40	856.492	1085.085	1316.234
	13:45	854.413	1082.564	1313.337
	13:50	852.341	1080.052	1310.451
	13:55	850.277	1077.548	1307.573
	14:00	848.219	1075.054	1304.705
	14:05	846.169	1072.567	1301.846
	14:10	844.125	1070.089	1298.996
	14:15	842.089	1067.620	1296.154
	14:20	840.060	1065.159	1293.322
	14:25	838.038	1062.706	1290.498
	14:30	836.022	1060.261	1287.683
	14:35	834.014	1057.823	1284.876
	14:40	832.011	1055.394	1282.076
	14:45	830.015	1052.972	1279.285
	14:50	828.026	1050.557	1276.501
	14:55	826.043	1048.149	1273.724
	15:00	824.066	1045.750	1270.956
	15:05	822.096	1043.358	1268.196
	15:10	820.133	1040.974	1265.444
	15:15	818.177	1038.598	1262.700
	15:20	816.227	1036.229	1259.963
	15:25	814.284	1033.868	1257.235
	15:30	812.347	1031.515	1254.513
	15:35	810.416	1029.168	1251.799
	15:40	808.491	1026.829	1249.092
	15:45	806.573	1024.496	1246.392
	15:50	804.660	1022.170	1243.698
	15:55	802.753	1019.851	1241.011
	16:00	800.853	1017.539	1238.331
	16:05	798.958	1015.233	1235.656
	16:10	797.068	1012.934	1232.988
	16:15	795.185	1010.641	1230.326
	16:20	793.307	1008.355	1227.670
	16:25	791.434	1006.074	1225.019
	16:30	789.567	1003.799	1222.374
	16:35	787.705	1001.530	1219.734
	16:40	785.848	999.267	1217.099
	16:45	783.996	997.010	1214.469
	16:50	782.149	994.758	1211.844
	16:55	780.308	992.511	1209.224
	17:00	778.471	990.270	1206.608
	17:05	776.639	988.035	1203.997
	17:10	774.812	985.805	1201.391
	17:15	772.990	983.580	1198.788
	17:20	771.173	981.360	1196.190
	17:25	769.360	979.145	1193.596
	17:30	767.551	976.934	1191.005
	17:35	765.747	974.729	1188.418
	17:40	763.948	972.528	1185.835
	17:45	762.153	970.332	1183.256
	17:50	760.362	968.142	1180.680
	17:55	758.577	965.956	1178.108
	18:00	756.795	963.775	1175.540
	18:05	755.018	961.598	1172.975
	18:10	753.245	959.426	1170.413
	18:15	751.477	957.259	1167.855
	18:20	749.713	955.096	1165.299
	18:25	747.953	952.938	1162.747
	18:30	746.197	950.784	1160.197
	18:35	744.445	948.634	1157.650
	18:40	742.698	946.489	1155.107
	18:45	740.955	944.348	1152.566
	18:50	739.216	942.212	1150.029
	18:55	737.482	940.081	1147.495
	19:00	735.752	937.954	1144.963
	19:05	734.025	935.831	1142.434
	19:10	732.303	933.712	1139.908
	19:15	730.586	931.598	1137.384
	19:20	728.872	929.488	1134.863
	19:25	727.162	927.382	1132.345
	19:30	725.456	925.280	1129.828
	19:35	723.754	923.182	1127.313
	19:40	722.055	921.087	1124.801
	19:45	720.360	918.996	1122.289
	19:50	718.669	916.908	1119.779
	19:55	716.981	914.824	1117.271
	20:00	715.297	912.743	1114.765
	20:05	713.617	910.666	1112.259
	20:10	711.939	908.592	1109.756
	20:15	710.266	906.522	1107.253
	20:20	708.596	904.454	1104.752
	20:25	706.929	902.390	1102.252
	20:30	705.266	900.329	1099.752
	20:35	703.605	898.270	1097.253
	20:40	701.947	896.213	1094.754
	20:45	700.293	894.159	1092.255
	20:50	698.641	892.108	1089.757
	20:55	696.992	890.059	1087.260
	21:00	695.347	888.013	1084.762
	21:05	693.704	885.970	1082.265
	21:10	692.065	883.929	1079.769
	21:15	690.428	881.890	1077.273
	21:20	688.795	879.854	1074.777
	21:25	687.164	877.820	1072.281
	21:30	685.536	875.789	1069.785
	21:35	683.911	873.760	1067.289
	21:40	682.290	871.733	1064.794
	21:45	680.671	869.709	1062.299
	21:50	679.055	867.686	1059.804
	21:55	677.442	865.667	1057.309
	22:00	675.831	863.649	1054.815
	22:05	674.224	861.634	1052.321
	22:10	672.620	859.621	1049.827
	22:15	671.019	857.611	1047.333
	22:20	669.421	855.602	1044.840
	22:25	667.826	853.596	1042.346
	22:30	666.233	851.592	1039.853
	22:35	664.644	849.590	1037.361
	22:40	663.057	847.591	1034.868
	22:45	661.474	845.594	1032.376
	22:50	659.893	843.599	1029.884
	22:55	658.316	841.606	1027.393
	23:00	656.741	839.616	1024.903
	23:05	655.170	837.628	1022.413
	23:10	653.601	835.642	1019.923
	23:15	652.036	833.658	1017.433
	23:20	650.473	831.677	1014.944
	23:25	648.913	829.697	1012.456
	23:30	647.356	827.720	1009.968
	23:35	645.802	825.745	1007.480
	23:40	644.251	823.772	1004.993
	23:45	642.704	821.801	1002.507
	23:50	641.159	819.833	1000.022
	23:55	639.617	817.867	997.537



Masaka Hydrographs

Day5 Time	100-Year	1000-Year	10000-Year
0:00	638.078	876.904	1056.064
0:05	636.643	813.942	992.571
0:10	635.010	811.984	990.089
0:15	633.481	810.027	987.609
0:20	631.955	808.074	985.130
0:25	630.430	806.122	982.652
0:30	628.913	804.174	980.176
0:35	627.397	802.228	977.700
0:40	625.884	800.284	975.226
0:45	624.374	798.343	972.754
0:50	622.868	796.406	970.283
0:55	621.365	794.470	967.814
1:00	619.865	792.537	965.347
1:05	618.369	790.607	962.881
1:10	616.876	788.680	960.417
1:15	615.386	786.755	957.955
1:20	613.900	784.834	955.495
1:25	612.417	782.915	953.036
1:30	610.938	780.999	950.580
1:35	609.462	779.085	948.126
1:40	607.990	777.175	945.674
1:45	606.521	775.268	943.224
1:50	605.055	773.364	940.777
1:55	603.594	771.462	938.332
2:00	602.135	769.564	935.889
2:05	600.681	767.669	933.450
2:10	599.230	765.778	931.012
2:15	597.783	763.889	928.578
2:20	596.339	762.004	926.146
2:25	594.899	760.121	923.717
2:30	593.463	758.243	921.291
2:35	592.031	756.367	918.868
2:40	590.602	754.495	916.448
2:45	589.178	752.627	914.031
2:50	587.757	750.761	911.617
2:55	586.339	748.899	909.205
3:00	584.925	747.040	906.797
3:05	583.516	745.184	904.392
3:10	582.109	743.332	901.990
3:15	580.707	741.483	899.592
3:20	579.308	739.638	897.196
3:25	577.913	737.796	894.804
3:30	576.523	735.958	892.415
3:35	575.135	734.123	890.030
3:40	573.752	732.291	887.648
3:45	572.373	730.464	885.270
3:50	570.998	728.639	882.895
3:55	569.626	726.818	880.524
4:00	568.259	725.002	878.157
4:05	566.895	723.188	875.793
4:10	565.535	721.379	873.433
4:15	564.180	719.573	871.077
4:20	562.828	717.771	868.724
4:25	561.481	715.972	866.376
4:30	560.137	714.177	864.031
4:35	558.797	712.386	861.691
4:40	557.462	710.599	859.354
4:45	556.130	708.815	857.021
4:50	554.802	707.036	854.691
4:55	553.478	705.259	852.366
5:00	552.159	703.486	850.045
5:05	550.843	701.716	847.727
5:10	549.531	699.951	845.414
5:15	548.223	698.189	843.105
5:20	546.920	696.431	840.799
5:25	545.620	694.677	838.498
5:30	544.324	692.926	836.200
5:35	543.032	691.179	833.907
5:40	541.744	689.436	831.618
5:45	540.460	687.697	829.333
5:50	539.181	685.961	827.052
5:55	537.905	684.229	824.775
6:00	536.633	682.500	822.502
6:05	535.365	680.775	820.234
6:10	534.101	679.054	817.969
6:15	532.840	677.337	815.709
6:20	531.584	675.623	813.452
6:25	530.332	673.912	811.200
6:30	529.083	672.205	808.952
6:35	527.838	670.502	806.708
6:40	526.597	668.802	804.468
6:45	525.360	667.106	802.231
6:50	524.127	665.413	799.999
6:55	522.897	663.723	797.771
7:00	521.671	662.037	795.547
7:05	520.448	660.354	793.327
7:10	519.230	658.675	791.111
7:15	518.015	656.999	788.899
7:20	516.803	655.326	786.692
7:25	515.595	653.657	784.488
7:30	514.391	651.990	782.288
7:35	513.190	650.328	780.092
7:40	511.992	648.668	777.900
7:45	510.798	647.012	775.712
7:50	509.608	645.358	773.529
7:55	508.421	643.708	771.349
8:00	507.237	642.061	769.173
8:05	506.057	640.418	767.001
8:10	504.879	638.777	764.833
8:15	503.705	637.139	762.670
8:20	502.535	635.505	760.510
8:25	501.367	633.873	758.353
8:30	500.202	632.244	756.201
8:35	499.041	630.619	754.053
8:40	497.882	628.996	751.909
8:45	496.727	627.376	749.768
8:50	495.574	625.759	747.631
8:55	494.424	624.144	745.499
9:00	493.278	622.533	743.370
9:05	492.134	620.924	741.245
9:10	490.993	619.319	739.124
9:15	489.854	617.716	737.007
9:20	488.719	616.115	734.894
9:25	487.586	614.518	732.785
9:30	486.455	612.923	730.679
9:35	485.328	611.331	728.578
9:40	484.203	609.742	726.481
9:45	483.080	608.155	724.387
9:50	481.960	606.571	722.298
9:55	480.843	604.990	720.212
10:00	479.728	603.411	718.130
10:05	478.615	601.835	716.053
10:10	477.505	600.262	713.979
10:15	476.397	598.691	711.909
10:20	475.291	597.123	709.843
10:25	474.187	595.557	707.781
10:30	473.086	593.994	705.723
10:35	471.987	592.433	703.669
10:40	470.890	590.875	701.619
10:45	469.796	589.320	699.573
10:50	468.703	587.767	697.531
10:55	467.612	586.217	695.493
11:00	466.524	584.669	693.459
11:05	465.437	583.124	691.429
11:10	464.353	581.581	689.403
11:15	463.270	580.041	687.382
11:20	462.190	578.503	685.364
11:25	461.111	576.968	683.350
11:30	460.034	575.436	681.341
11:35	458.959	573.906	679.336
11:40	457.886	572.378	677.335
11:45	456.815	570.853	675.338
11:50	455.746	569.331	673.345
11:55	454.678	567.811	671.356

Masaka Hydrographs

Day5 Time	100-Year	1000-Year	10000-Year
12:00	453.612	566.294	669.371
12:05	452.548	564.779	667.391
12:10	451.486	563.267	665.415
12:15	450.425	561.758	663.443
12:20	449.366	560.251	661.475
12:25	448.309	558.746	659.510
12:30	447.253	557.244	657.553
12:35	446.199	555.745	655.598
12:40	445.147	554.248	653.647
12:45	444.096	552.754	651.701
12:50	443.047	551.263	649.759
12:55	441.999	549.774	647.821
13:00	440.953	548.288	645.888
13:05	439.909	546.805	643.959
13:10	438.866	545.324	642.035
13:15	437.825	543.846	640.114
13:20	436.785	542.370	638.199
13:25	435.747	540.897	636.287
13:30	434.710	539.427	634.381
13:35	433.675	537.960	632.478
13:40	432.642	536.495	630.580
13:45	431.610	535.033	628.687
13:50	430.580	533.574	626.798
13:55	429.551	532.117	624.913
14:00	428.523	530.664	623.033
14:05	427.497	529.213	621.157
14:10	426.473	527.765	619.286
14:15	425.450	526.319	617.420
14:20	424.429	524.877	615.558
14:25	423.409	523.437	613.700
14:30	422.391	522.000	611.847
14:35	421.374	520.566	609.999
14:40	420.359	519.135	608.155
14:45	419.345	517.706	606.316
14:50	418.332	516.281	604.481
14:55	417.322	514.858	602.651
15:00	416.313	513.438	600.826
15:05	415.305	512.021	599.005
15:10	414.299	510.608	597.189
15:15	413.294	509.197	595.377
15:20	412.291	507.789	593.570
15:25	411.290	506.383	591.768
15:30	410.290	504.981	589.970
15:35	409.291	503.582	588.177
15:40	408.294	502.186	586.389
15:45	407.299	500.793	584.605
15:50	406.305	499.402	582.826
15:55	405.313	498.015	581.052
16:00	404.322	496.631	579.282
16:05	403.333	495.250	577.517
16:10	402.346	493.871	575.756
16:15	401.360	492.496	574.000
16:20	400.376	491.124	572.249
16:25	399.393	489.755	570.503
16:30	398.412	488.389	568.761
16:35	397.432	487.026	567.024
16:40	396.454	485.666	565.291
16:45	395.478	484.309	563.563
16:50	394.503	482.955	561.840
16:55	393.530	481.605	560.122
17:00	392.559	480.257	558.408
17:05	391.589	478.913	556.699
17:10	390.621	477.571	554.994
17:15	389.655	476.233	553.294
17:20	388.690	474.898	551.599
17:25	387.727	473.566	549.909
17:30	386.766	472.237	548.223
17:35	385.807	470.911	546.541
17:40	384.849	469.589	544.865
17:45	383.892	468.269	543.193
17:50	382.938	466.953	541.525
17:55	381.985	465.640	539.863
18:00	381.034	464.330	538.204
18:05	380.085	463.023	536.551
18:10	379.137	461.718	534.902
18:15	378.191	460.418	533.258
18:20	377.247	459.121	531.618
18:25	376.305	457.827	529.983
18:30	375.364	456.535	528.353
18:35	374.425	455.246	526.727
18:40	373.488	453.963	525.105
18:45	372.553	452.681	523.489
18:50	371.620	451.403	521.876
18:55	370.688	450.127	520.269
19:00	369.758	448.855	518.666
19:05	368.830	447.586	517.067
19:10	367.904	446.321	515.473
19:15	366.980	445.058	513.884
19:20	366.057	443.799	512.299
19:25	365.136	442.543	510.719
19:30	364.216	441.290	509.143
19:35	363.301	440.040	507.572
19:40	362.385	438.793	506.006
19:45	361.472	437.550	504.443
19:50	360.561	436.309	502.885
19:55	359.651	435.072	501.332
20:00	358.744	433.838	499.783
20:05	357.838	432.607	498.239
20:10	356.934	431.380	496.699
20:15	356.032	430.156	495.163
20:20	355.132	428.934	493.633
20:25	354.234	427.716	492.106
20:30	353.337	426.501	490.584
20:35	352.443	425.289	489.066
20:40	351.550	424.080	487.553
20:45	350.660	422.875	486.044
20:50	349.771	421.672	484.539
20:55	348.884	420.473	483.039
21:00	347.999	419.277	481.544
21:05	347.117	418.084	480.052
21:10	346.236	416.894	478.565
21:15	345.357	415.707	477.083
21:20	344.480	414.524	475.604
21:25	343.604	413.343	474.130
21:30	342.731	412.166	472.660
21:35	341.860	410.992	471.195
21:40	340.991	409.820	469.734
21:45	340.123	408.652	468.277
21:50	339.258	407.487	466.825
21:55	338.394	406.325	465.376
22:00	337.533	405.167	463.932
22:05	336.673	404.011	462.493
22:10	335.816	402.858	461.057
22:15	334.960	401.708	459.626
22:20	334.106	400.562	458.199
22:25	333.254	399.418	456.776
22:30	332.405	398.278	455.357
22:35	331.557	397.140	453.942
22:40	330.711	396.006	452.532
22:45	329.867	394.874	451.126
22:50	329.025	393.746	449.724
22:55	328.185	392.621	448.326
23:00	327.346	391.498	446.932
23:05	326.510	390.379	445.543
23:10	325.676	389.262	444.157
23:15	324.844	388.149	442.776
23:20	324.013	387.038	441.399
23:25	323.185	385.931	440.025
23:30	322.358	384.826	438.656
23:35	321.534	383.725	437.291
23:40	320.711	382.626	435.930
23:45	319.891	381.530	434.573
23:50	319.072	380.438	433.221
23:55	318.255	379.348	431.872

Masaka Hydrographs

Day6 Time	100-Year	1000-Year	10000-Year
0:00	317.440	378.261	430.527
0:05	316.627	377.177	429.186
0:10	315.816	376.096	427.849
0:15	315.007	375.018	426.517
0:20	314.200	373.943	425.188
0:25	313.395	372.870	423.863
0:30	312.592	371.801	422.542
0:35	311.790	370.734	421.225
0:40	310.991	369.670	419.912
0:45	310.193	368.609	418.604
0:50	309.397	367.551	417.298
0:55	308.603	366.496	415.997
1:00	307.811	365.444	414.700
1:05	307.021	364.394	413.407
1:10	306.233	363.348	412.118
1:15	305.447	362.304	410.832
1:20	304.663	361.263	409.551
1:25	303.880	360.225	408.273
1:30	303.099	359.189	406.999
1:35	302.321	358.157	405.729
1:40	301.544	357.127	404.463
1:45	300.769	356.100	403.201
1:50	299.995	355.075	401.943
1:55	299.224	354.054	400.688
2:00	298.454	353.035	399.437
2:05	297.687	352.019	398.190
2:10	296.921	351.006	396.947
2:15	296.157	349.995	395.708
2:20	295.395	348.988	394.472
2:25	294.634	347.983	393.240
2:30	293.876	346.980	392.012
2:35	293.119	345.981	390.788
2:40	292.364	344.984	389.567
2:45	291.610	343.990	388.351
2:50	290.859	342.998	387.137
2:55	290.109	342.009	385.928
3:00	289.361	341.023	384.722
3:05	288.615	340.040	383.520
3:10	287.871	339.059	382.322
3:15	287.128	338.080	381.127
3:20	286.387	337.105	379.936
3:25	285.648	336.132	378.749
3:30	284.911	335.162	377.565
3:35	284.175	334.194	376.385
3:40	283.441	333.229	375.209
3:45	282.709	332.267	374.036
3:50	281.979	331.307	372.867
3:55	281.250	330.350	371.701
4:00	280.523	329.396	370.539
4:05	279.798	328.444	369.381
4:10	279.075	327.494	368.225
4:15	278.353	326.548	367.075
4:20	277.633	325.604	365.927
4:25	276.914	324.662	364.784
4:30	276.197	323.723	363.643
4:35	275.482	322.787	362.506
4:40	274.769	321.853	361.373
4:45	274.058	320.922	360.243
4:50	273.348	319.994	359.117
4:55	272.639	319.068	357.994
5:00	271.933	318.144	356.875
5:05	271.228	317.223	355.760
5:10	270.525	316.305	354.647
5:15	269.823	315.388	353.539
5:20	269.123	314.476	352.434
5:25	268.425	313.565	351.332
5:30	267.728	312.657	350.234
5:35	267.033	311.751	349.139
5:40	266.340	310.848	348.048
5:45	265.648	309.947	346.960
5:50	264.958	309.049	345.876
5:55	264.270	308.154	344.795
6:00	263.583	307.260	343.717
6:05	262.898	306.370	342.643
6:10	262.214	305.482	341.573
6:15	261.532	304.596	340.506
6:20	260.852	303.713	339.442
6:25	260.173	302.832	338.381
6:30	259.496	301.954	337.324
6:35	258.821	301.078	336.271
6:40	258.147	300.205	335.220
6:45	257.475	299.335	334.174
6:50	256.804	298.466	333.130
6:55	256.135	297.601	332.090
7:00	255.468	296.737	331.053
7:05	254.802	295.876	330.019
7:10	254.138	295.018	328.989
7:15	253.476	294.162	327.962
7:20	252.814	293.308	326.939
7:25	252.154	292.457	325.918
7:30	251.496	291.609	324.901
7:35	250.840	290.762	323.888
7:40	250.185	289.919	322.878
7:45	249.532	289.077	321.870
7:50	248.880	288.238	320.867
7:55	248.230	287.402	319.866
8:00	247.582	286.567	318.869
8:05	246.935	285.736	317.874
8:10	246.290	284.906	316.884
8:15	245.646	284.079	315.896
8:20	245.004	283.255	314.911
8:25	244.363	282.433	313.930
8:30	243.724	281.613	312.952
8:35	243.086	280.795	311.977
8:40	242.450	279.980	311.006
8:45	241.816	279.168	310.037
8:50	241.183	278.357	309.072
8:55	240.551	277.549	308.110
9:00	239.921	276.744	307.151
9:05	239.293	275.940	306.195
9:10	238.666	275.139	305.242
9:15	238.041	274.340	304.292
9:20	237.417	273.545	303.346
9:25	236.795	272.751	302.403
9:30	236.174	271.959	301.462
9:35	235.555	271.170	300.525
9:40	234.937	270.383	299.591
9:45	234.321	269.598	298.660
9:50	233.707	268.816	297.732
9:55	233.094	268.036	296.807
10:00	232.482	267.258	295.885
10:05	231.872	266.483	294.966
10:10	231.263	265.710	294.051
10:15	230.656	264.939	293.138
10:20	230.051	264.171	292.228
10:25	229.447	263.404	291.322
10:30	228.844	262.640	290.418
10:35	228.243	261.879	289.517
10:40	227.644	261.119	288.620
10:45	227.046	260.362	287.725
10:50	226.449	259.607	286.833
10:55	225.854	258.854	285.944
11:00	225.261	258.103	285.058
11:05	224.669	257.356	284.176
11:10	224.078	256.610	283.296
11:15	223.489	255.866	282.419
11:20	222.901	255.125	281.545
11:25	222.316	254.385	280.673
11:30	221.731	253.648	279.805
11:35	221.148	252.914	278.940
11:40	220.566	252.181	278.077
11:45	219.986	251.451	277.218
11:50	219.407	250.722	276.361
11:55	218.830	249.996	275.507

Masaka Hydrographs

Day6 Time	100-Year	1000-Year	10000-Year
12:00	218.254	249.272	274.656
12:05	217.680	248.551	273.808
12:10	217.107	247.831	272.963
12:15	216.536	247.114	272.120
12:20	215.966	246.399	271.281
12:25	215.397	245.686	270.444
12:30	214.830	244.975	269.610
12:35	214.265	244.267	268.778
12:40	213.701	243.560	267.950
12:45	213.138	242.856	267.124
12:50	212.577	242.154	266.301
12:55	212.017	241.453	265.481
13:00	211.459	240.756	264.664
13:05	210.902	240.060	263.849
13:10	210.347	239.366	263.038
13:15	209.793	238.674	262.229
13:20	209.242	237.985	261.422
13:25	208.689	237.298	260.619
13:30	208.139	236.612	259.818
13:35	207.591	235.929	259.019
13:40	207.045	235.248	258.224
13:45	206.499	234.569	257.431
13:50	205.955	233.892	256.641
13:55	205.413	233.218	255.853
14:00	204.872	232.545	255.068
14:05	204.332	231.874	254.286
14:10	203.794	231.206	253.507
14:15	203.257	230.539	252.730
14:20	202.722	229.875	251.956
14:25	202.188	229.212	251.184
14:30	201.655	228.552	250.415
14:35	201.124	227.894	249.649
14:40	200.594	227.237	248.885
14:45	200.066	226.583	248.124
14:50	199.539	225.931	247.365
14:55	199.014	225.280	246.609
15:00	198.489	224.632	245.856
15:05	197.967	223.986	245.105
15:10	197.445	223.342	244.356
15:15	196.925	222.700	243.611
15:20	196.407	222.059	242.867
15:25	195.890	221.421	242.127
15:30	195.374	220.785	241.389
15:35	194.860	220.151	240.653
15:40	194.347	219.518	239.920
15:45	193.835	218.888	239.189
15:50	193.325	218.260	238.461
15:55	192.816	217.633	237.736
16:00	192.308	217.009	237.012
16:05	191.802	216.386	236.291
16:10	191.297	215.766	235.573
16:15	190.794	215.147	234.857
16:20	190.292	214.531	234.144
16:25	189.791	213.916	233.433
16:30	189.292	213.303	232.725
16:35	188.794	212.692	232.019
16:40	188.298	212.083	231.315
16:45	187.802	211.476	230.614
16:50	187.308	210.871	229.915
16:55	186.816	210.268	229.219
17:00	186.325	209.667	228.525
17:05	185.835	209.067	227.833
17:10	185.346	208.470	227.144
17:15	184.859	207.874	226.457
17:20	184.373	207.280	225.773
17:25	183.889	206.688	225.091
17:30	183.406	206.098	224.411
17:35	182.924	205.510	223.733
17:40	182.444	204.924	223.058
17:45	181.964	204.339	222.385
17:50	181.487	203.757	221.715
17:55	181.010	203.176	221.047
18:00	180.535	202.597	220.381
18:05	180.061	202.020	219.717
18:10	179.588	201.444	219.056
18:15	179.117	200.871	218.397
18:20	178.647	200.299	217.740
18:25	178.179	199.730	217.086
18:30	177.711	199.162	216.434
18:35	177.245	198.595	215.784
18:40	176.780	198.031	215.136
18:45	176.317	197.468	214.490
18:50	175.855	196.907	213.847
18:55	175.394	196.348	213.206
19:00	174.934	195.791	212.567
19:05	174.476	195.236	211.931
19:10	174.019	194.682	211.296
19:15	173.564	194.130	210.664
19:20	173.109	193.580	210.034
19:25	172.656	193.031	209.406
19:30	172.204	192.485	208.780
19:35	171.753	191.940	208.157
19:40	171.304	191.397	207.536
19:45	170.856	190.855	206.916
19:50	170.409	190.315	206.299
19:55	169.964	189.777	205.684
20:00	169.519	189.241	205.072
20:05	169.076	188.706	204.461
20:10	168.635	188.174	203.852
20:15	168.194	187.642	203.246
20:20	167.755	187.113	202.642
20:25	167.317	186.585	202.039
20:30	166.880	186.059	201.439
20:35	166.444	185.535	200.841
20:40	166.010	185.012	200.246
20:45	165.577	184.491	199.653
20:50	165.145	183.972	199.059
20:55	164.715	183.454	198.469
21:00	164.285	182.938	197.882
21:05	163.857	182.424	197.296
21:10	163.430	181.911	196.712
21:15	163.004	181.400	196.131
21:20	162.580	180.891	195.551
21:25	162.157	180.383	194.973
21:30	161.734	179.877	194.398
21:35	161.314	179.372	193.824
21:40	160.894	178.869	193.252
21:45	160.475	178.368	192.682
21:50	160.058	177.868	192.115
21:55	159.642	177.370	191.549
22:00	159.227	176.874	190.985
22:05	158.814	176.379	190.423
22:10	158.401	175.886	189.864
22:15	157.990	175.394	189.306
22:20	157.580	174.904	188.750
22:25	157.171	174.416	188.196
22:30	156.763	173.929	187.643
22:35	156.356	173.443	187.093
22:40	155.951	172.959	186.545
22:45	155.547	172.477	185.998
22:50	155.143	171.997	185.454
22:55	154.740	171.517	184.911
23:00	154.341	171.040	184.370
23:05	153.941	170.564	183.832
23:10	153.543	170.089	183.295
23:15	153.145	169.616	182.759
23:20	152.749	169.145	182.226
23:25	152.354	168.675	181.695
23:30	151.960	168.207	181.165
23:35	151.568	167.740	180.637
23:40	151.176	167.274	180.111
23:45	150.786	166.811	179.587
23:50	150.396	166.348	179.065
23:55	150.008	165.887	178.544

Masaka Hydrographs				
	Time	100-Year	1000-Year	10000-Year
Day7	0:00	149.621	165.428	178.026
	0:05	149.235	164.970	177.509
	0:10	148.850	164.514	176.994
	0:15	148.466	164.059	176.480
	0:20	148.084	163.605	175.969
	0:25	147.702	163.153	175.459
	0:30	147.322	162.702	174.951
	0:35	146.943	162.253	174.445
	0:40	146.564	161.806	173.940
	0:45	146.187	161.359	173.437
	0:50	145.811	160.915	172.936
	0:55	145.437	160.471	172.437
	1:00	145.063	160.029	171.939
	1:05	144.690	159.589	171.443
	1:10	144.318	159.150	170.949
	1:15	143.948	158.712	170.457
	1:20	143.578	158.276	169.966
	1:25	143.210	157.841	169.477
	1:30	142.843	157.408	168.989
	1:35	142.476	156.976	168.504
	1:40	142.111	156.545	168.020
	1:45	141.747	156.116	167.537
	1:50	141.384	155.688	167.056
	1:55	141.022	155.261	166.577
	2:00	140.661	154.836	166.100
	2:05	140.301	154.412	165.624
	2:10	139.942	153.990	165.150
	2:15	139.585	153.569	164.677
	2:20	139.228	153.149	164.207
	2:25	138.872	152.731	163.737
	2:30	138.517	152.314	163.270
	2:35	138.164	151.898	162.803
	2:40	137.811	151.484	162.339
	2:45	137.460	151.071	161.876
	2:50	137.109	150.659	161.415
	2:55	136.759	150.249	160.955
	3:00	136.411	149.840	160.497
	3:05	136.063	149.432	160.040
	3:10	135.717	149.026	159.585
	3:15	135.371	148.621	159.132
	3:20	135.027	148.217	158.680
	3:25	134.684	147.814	158.230
	3:30	134.341	147.413	157.781
	3:35	134.000	147.013	157.333
	3:40	133.659	146.615	156.888
	3:45	133.320	146.217	156.443
	3:50	132.981	145.821	156.001
	3:55	132.644	145.427	155.560
	4:00	132.307	145.033	155.120
	4:05	131.972	144.641	154.682
	4:10	131.637	144.250	154.245
	4:15	131.303	143.860	153.810
	4:20	130.971	143.471	153.376
	4:25	130.639	143.084	152.944
	4:30	130.309	142.698	152.513
	4:35	129.979	142.313	152.083
	4:40	129.650	141.930	151.656
	4:45	129.322	141.547	151.229
	4:50	128.995	141.166	150.804
	4:55	128.670	140.786	150.381
	5:00	128.345	140.408	149.958
	5:05	128.021	140.030	149.538
	5:10	127.698	139.654	149.119
	5:15	127.376	139.279	148.701
	5:20	127.054	138.905	148.284
	5:25	126.734	138.532	147.869
	5:30	126.415	138.161	147.456
	5:35	126.096	137.791	147.043
	5:40	125.779	137.421	146.633
	5:45	125.463	137.053	146.223
	5:50	125.147	136.687	145.815
	5:55	124.832	136.321	145.409
	6:00	124.519	135.957	145.003
	6:05	124.206	135.593	144.599
	6:10	123.894	135.231	144.197
	6:15	123.583	134.870	143.796
	6:20	123.273	134.511	143.396
	6:25	122.964	134.152	142.997
	6:30	122.655	133.794	142.600
	6:35	122.348	133.438	142.204
	6:40	122.041	133.083	141.810
	6:45	121.736	132.729	141.417
	6:50	121.431	132.376	141.025
	6:55	121.127	132.025	140.634
	7:00	120.824	131.673	140.245
	7:05	120.522	131.323	139.857
	7:10	120.221	130.975	139.471
	7:15	119.921	130.627	139.085
	7:20	119.621	130.281	138.701
	7:25	119.323	129.936	138.319
	7:30	119.025	129.592	137.937
	7:35	118.728	129.249	137.557
	7:40	118.432	128.907	137.178
	7:45	118.137	128.566	136.800
	7:50	117.843	128.226	136.424
	7:55	117.550	127.888	136.049
	8:00	117.257	127.550	135.675
	8:05	116.965	127.213	135.302
	8:10	116.675	126.878	134.931
	8:15	116.385	126.543	134.561
	8:20	116.096	126.210	134.192
	8:25	115.807	125.878	133.824
	8:30	115.520	125.547	133.458
	8:35	115.233	125.216	133.092
	8:40	114.948	124.887	132.728
	8:45	114.663	124.559	132.366
	8:50	114.378	124.232	132.004
	8:55	114.095	123.906	131.644
	9:00	113.813	123.581	131.284
	9:05	113.531	123.257	130.926
	9:10	113.250	122.934	130.569
	9:15	112.970	122.612	130.214
	9:20	112.691	122.291	129.859
	9:25	112.413	121.971	129.506
	9:30	112.135	121.653	129.154
	9:35	111.859	121.336	128.803
	9:40	111.583	121.019	128.453
	9:45	111.307	120.702	128.104
	9:50	111.033	120.387	127.756
	9:55	110.760	120.073	127.410
	10:00	110.487	119.760	127.065
	10:05	110.215	119.448	126.720
	10:10	109.944	119.137	126.377
	10:15	109.673	118.827	126.035
	10:20	109.404	118.519	125.695
	10:25	109.136	118.211	125.355
	10:30	108.867	117.903	125.016
	10:35	108.600	117.597	124.679
	10:40	108.333	117.292	124.342
	10:45	108.068	116.988	124.007
	10:50	107.803	116.685	123.673
	10:55	107.539	116.383	123.340
	11:00	107.275	116.082	123.007
	11:05	107.013	115.781	122.676
	11:10	106.751	115.482	122.347
	11:15	106.490	115.183	122.018
	11:20	106.230	114.886	121.690
	11:25	105.970	114.589	121.363
	11:30	105.711	114.294	121.037
	11:35	105.453	113.999	120.713
	11:40	105.196	113.705	120.389
	11:45	104.939	113.412	120.066
	11:50	104.684	113.120	119.745
	11:55	104.428	112.829	119.424

Masaka Hydrographs				
	Time	100-Year	1000-Year	10000-Year
Day7	12:00	104.174	112.539	119.105
	12:05	103.921	112.250	118.786
	12:10	103.668	111.961	118.469
	12:15	103.416	111.674	118.152
	12:20	103.164	111.387	117.837
	12:25	102.914	111.102	117.522
	12:30	102.664	110.817	117.208
	12:35	102.415	110.533	116.896
	12:40	102.166	110.250	116.584
	12:45	101.918	109.968	116.274
	12:50	101.671	109.687	115.964
	12:55	101.425	109.407	115.655
	13:00	101.179	109.127	115.348
	13:05	100.935	108.849	115.041
	13:10	100.690	108.571	114.735
	13:15	100.447	108.294	114.430
	13:20	100.204	108.018	114.126
	13:25	99.962	107.743	113.823
	13:30	99.721	107.468	113.521
	13:35	99.480	107.195	113.220
	13:40	99.240	106.922	112.920
	13:45	99.001	106.651	112.621
	13:50	98.762	106.380	112.322
	13:55	98.525	106.110	112.025
	14:00	98.287	105.840	111.728
	14:05	98.051	105.572	111.433
	14:10	97.815	105.304	111.138
	14:15	97.580	105.038	110.844
	14:20	97.346	104.772	110.551
	14:25	97.112	104.506	110.259
	14:30	96.879	104.242	109.968
	14:35	96.646	103.979	109.677
	14:40	96.415	103.716	109.388
	14:45	96.184	103.454	109.099
	14:50	95.953	103.193	108.812
	14:55	95.723	102.933	108.525
	15:00	95.494	102.673	108.239
	15:05	95.266	102.415	107.953
	15:10	95.038	102.157	107.669
	15:15	94.811	101.899	107.385
	15:20	94.585	101.643	107.102
	15:25	94.359	101.388	106.821
	15:30	94.134	101.133	106.539
	15:35	93.909	100.879	106.259
	15:40	93.686	100.626	105.980
	15:45	93.462	100.373	105.701
	15:50	93.240	100.121	105.423
	15:55	93.018	99.870	105.146
	16:00	92.797	99.620	104.870
	16:05	92.576	99.371	104.594
	16:10	92.356	99.122	104.319
	16:15	92.137	98.874	104.045
	16:20	91.918	98.627	103.772
	16:25	91.700	98.381	103.499
	16:30	91.483	98.135	103.228
	16:35	91.266	97.890	102.957
	16:40	91.050	97.646	102.687
	16:45	90.834	97.402	102.417
	16:50	90.619	97.160	102.148
	16:55	90.405	96.917	101.880
	17:00	90.191	96.676	101.613
	17:05	89.978	96.436	101.346
	17:10	89.765	96.196	101.081
	17:15	89.554	95.957	100.815
	17:20	89.342	95.718	100.551
	17:25	89.132	95.480	100.287
	17:30	88.922	95.243	100.024
	17:35	88.712	95.007	99.762
	17:40	88.503	94.771	99.500
	17:45	88.295	94.536	99.239
	17:50	88.087	94.302	98.979
	17:55	87.880	94.069	98.719
	18:00	87.674	93.836	98.460
	18:05	87.468	93.603	98.202
	18:10	87.263	93.372	97.944
	18:15	87.058	93.141	97.687
	18:20	86.854	92.911	97.430
	18:25	86.650	92.681	97.174
	18:30	86.447	92.452	96.919
	18:35	86.245	92.224	96.664
	18:40	86.043	91.997	96.410
	18:45	85.842	91.770	96.157
	18:50	85.642	91.543	95.904
	18:55	85.441	91.316	95.652
	19:00	85.242	91.093	95.400
	19:05	85.043	90.869	95.149
	19:10	84.845	90.645	94.898
	19:15	84.647	90.422	94.648
	19:20	84.450	90.200	94.398
	19:25	84.253	89.978	94.149
	19:30	84.057	89.757	93.900
	19:35	83.861	89.536	93.652
	19:40	83.667	89.316	93.404
	19:45	83.472	89.097	93.157
	19:50	83.278	88.878	92.910
	19:55	83.085	88.660	92.664
	20:00	82.892	88.443	92.418
	20:05	82.700	88.226	92.173
	20:10	82.508	88.010	91.928
	20:15	82.317	87.794	91.683
	20:20	82.127	87.579	91.438
	20:25	81.937	87.365	91.194
	20:30	81.747	87.151	90.951
	20:35	81.558	86.938	90.707
	20:40	81.370	86.725	90.464
	20:45	81.182	86.513	90.221
	20:50	80.994	86.301	89.979
	20:55	80.807	86.090	89.736
	21:00	80.621	85.880	89.494
	21:05	80.435	85.670	89.252
	21:10	80.250	85.461	89.010
	21:15	80.065	85.252	88.769
	21:20	79.881	85.044	88.527
	21:25	79.697	84.837	88.286
	21:30	79.514	84.630	88.044
	21:35	79.332	84.423	87.803
	21:40	79.149	84.217	87.562
	21:45	78.968	84.012	87.321
	21:50	78.787	83.807	87.080
	21:55	78.606	83.603	86.838
	22:00	78.426	83.399	86.597
	22:05	78.246	83.196	86.356
	22:10	78.067	82.993	86.114
	22:15	77.889	82.791	85.873
	22:20	77.711	82.589	85.631
	22:25	77.533	82.388	85.389
	22:30	77.356	82.187	85.147
	22:35	77.179	81.987	84.905
	22:40	77.003	81.788	84.662
	22:45	76.827	81.589	84.419
	22:50	76.652	81.390	84.176
	22:55	76.476	81.192	83.933
	23:00	76.303	80.994	83.689
	23:05	76.130	80.797	83.445
	23:10	75.956	80.600	83.200
	23:15	75.784	80.404	82.955
	23:20	75.612	80.208	82.710
	23:25	75.440	80.013	82.464
	23:30	75.268	79.819	82.218
	23:35	75.098	79.624	81.971
	23:40	74.927	79.430	81.723
	23:45	74.757	79.237	81.475
	23:50	74.588	79.044	81.227
	23:55	74.419	78.852	80.978

Masaka Hydrographs				
	Time	100-Year	1000-Year	10000-Year
Day8	0:00	74.250	78.660	80.728
	0:05	74.082	78.468	80.478
	0:10	73.915	78.277	80.227
	0:15	73.748	78.086	79.976
	0:20	73.581	77.895	79.724
	0:25	73.415	77.705	79.471
	0:30	73.249	77.517	79.218
	0:35	73.084	77.328	78.964
	0:40	72.919	77.139	78.709
	0:45	72.755	76.951	78.453
	0:50	72.591	76.763	78.197
	0:55	72.427	76.575	77.941
	1:00	72.264	76.388	77.683
	1:05	72.101	76.202	77.425
	1:10	71.939	76.015	77.166
	1:15	71.777	75.829	76.907
	1:20	71.616	75.644	76.647
	1:25	71.455	75.459	76.386
	1:30	71.295	75.274	76.125
	1:35	71.135	75.089	75.862
	1:40	70.975	74.905	75.600
	1:45	70.816	74.721	75.336
	1:50	70.657	74.537	75.072
	1:55	70.499	74.354	74.808
	2:00	70.341	74.171	74.543
	2:05	70.183	73.988	74.277
	2:10	70.026	73.805	74.011
	2:15	69.870	73.623	73.744
	2:20	69.713	73.441	73.477
	2:25	69.558	73.259	73.209
	2:30	69.402	73.078	72.941
	2:35	69.247	72.896	72.672
	2:40	69.093	72.715	72.403
	2:45	68.938	72.534	72.134
	2:50	68.785	72.353	71.864
	2:55	68.631	72.173	71.594
	3:00	68.478	71.992	71.323
	3:05	68.326	71.812	71.053
	3:10	68.173	71.631	70.782
	3:15	68.021	71.451	70.511
	3:20	67.870	71.271	70.239
	3:25	67.719	71.091	69.968
	3:30	67.568	70.911	69.696
	3:35	67.418	70.731	69.425
	3:40	67.268	70.551	69.153
	3:45	67.119	70.372	68.881
	3:50	66.970	70.192	68.610
	3:55	66.821	70.012	68.338
	4:00	66.672	69.832	68.067
	4:05	66.525	69.652	67.795
	4:10	66.377	69.472	67.524
	4:15	66.230	69.291	67.253
	4:20	66.083	69.111	66.983
	4:25	65.936	68.931	66.712
	4:30	65.790	68.750	66.442
	4:35	65.644	68.569	66.173
	4:40	65.499	68.388	65.903
	4:45	65.354	68.207	65.634
	4:50	65.209	68.026	65.366
	4:55	65.065	67.844	65.098
	5:00	64.921	67.662	64.831
	5:05	64.777	67.480	64.564
	5:10	64.634	67.298	64.298
	5:15	64.491	67.115	64.032
	5:20	64.349	66.932	63.768
	5:25	64.208	66.748	63.503
	5:30	64.064	66.564	63.240
	5:35	63.923	66.380	62.978
	5:40	63.782	66.195	62.716
	5:45	63.641	66.010	62.455
	5:50	63.500	65.825	62.195
	5:55	63.360	65.639	61.935
	6:00	63.220	65.453	61.676
	6:05	63.081	65.266	61.421
	6:10	62.942	65.079	61.165
	6:15	62.803	64.891	60.910
	6:20	62.664	64.703	60.656
	6:25	62.526	64.514	60.403
	6:30	62.388	64.324	60.151
	6:35	62.250	64.135	59.901
	6:40	62.113	63.944	59.652
	6:45	61.976	63.753	59.403
	6:50	61.840	63.562	59.156
	6:55	61.703	63.370	58.911
	7:00	61.567	63.177	58.666
	7:05	61.432	62.984	58.423
	7:10	61.296	62.791	58.181
	7:15	61.161	62.596	57.941
	7:20	61.027	62.402	57.702
	7:25	60.892	62.206	57.464
	7:30	60.758	62.010	57.228
	7:35	60.624	61.814	56.993
	7:40	60.491	61.617	56.759
	7:45	60.357	61.419	56.527
	7:50	60.224	61.221	56.296
	7:55	60.092	61.023	56.067
	8:00	59.959	60.824	55.839
	8:05	59.827	60.624	55.613
	8:10	59.695	60.424	55.388
	8:15	59.564	60.223	55.165
	8:20	59.432	60.022	54.943
	8:25	59.301	59.821	54.723
	8:30	59.171	59.619	54.504
	8:35	59.040	59.416	54.287
	8:40	58.910	59.213	54.072
	8:45	58.780	59.010	53.858
	8:50	58.650	58.806	53.645
	8:55	58.521	58.602	53.434
	9:00	58.392	58.398	53.225
	9:05	58.263	58.193	53.017
	9:10	58.134	57.988	52.811
	9:15	58.006	57.783	52.606
	9:20	57.878	57.577	52.403
	9:25	57.750	57.371	52.201
	9:30	57.622	57.165	52.001
	9:35	57.495	56.959	51.803
	9:40	57.368	56.753	51.606
	9:45	57.241	56.546	51.410
	9:50	57.114	56.339	51.216
	9:55	56.987	56.133	51.024
	10:00	56.861	55.926	50.833
	10:05	56.735	55.719	50.644
	10:10	56.609	55.512	50.456
	10:15	56.483	55.305	50.270
	10:20	56.358	55.098	50.086
	10:25	56.232	54.891	49.902
	10:30	56.107	54.684	49.721
	10:35	55.982	54.478	49.540
	10:40	55.857	54.271	49.362
	10:45	55.733	54.065	49.184
	10:50	55.608	53.858	49.009
	10:55	55.484	53.653	48.834
	11:00	55.359	53.447	48.661
	11:05	55.235	53.241	48.490
	11:10	55.111	53.036	48.320
	11:15	54.988	52.832	48.151
	11:20	54.864	52.627	47.983
	11:25	54.740	52.423	47.817
	11:30	54.617	52.219	47.653
	11:35	54.493	52.016	47.490
	11:40	54.370	51.813	47.328
	11:45	54.247	51.611	47.167
	11:50	54.123	51.410	47.007
	11:55	54.000	51.208	46.849

Masaka Hydrographs				
	Time	100-Year	1000-Year	10000-Year
Day8	12:00	53.877	51.008	46.692
	12:05	53.754	50.808	46.537
	12:10	53.631	50.608	46.382
	12:15	53.508	50.410	46.229
	12:20	53.385	50.211	46.077
	12:25	53.262	50.014	45.926
	12:30	53.139	49.817	45.776
	12:35	53.016	49.621	45.628
	12:40	52.893	49.426	45.480
	12:45	52.769	49.232	45.334
	12:50	52.646	49.038	45.188
	12:55	52.523	48.845	45.044
	13:00	52.399	48.653	44.901
	13:05	52.276	48.462	44.759
	13:10	52.152	48.272	44.617
	13:15	52.028	48.082	44.477
	13:20	51.904	47.894	44.337
	13:25	51.780	47.706	44.199
	13:30	51.656	47.520	44.061
	13:35	51.532	47.334	43.924
	13:40	51.407	47.149	43.788
	13:45	51.282	46.966	43.653
	13:50	51.157	46.783	43.518
	13:55	51.032	46.601	43.384
	14:00	50.907	46.421	43.251
	14:05	50.781	46.241	43.119
	14:10	50.655	46.062	42.987
	14:15	50.529	45.885	42.856
	14:20	50.402	45.708	42.725
	14:25	50.275	45.533	42.595
	14:30	50.148	45.359	42.466
	14:35	50.021	45.186	42.337
	14:40	49.893	45.014	42.209
	14:45	49.765	44.843	42.080
	14:50	49.636	44.673	41.952
	14:55	49.507	44.504	41.824
	15:00	49.378	44.337	41.697
	15:05	49.249	44.170	41.569
	15:10	49.119	44.005	41.442
	15:15	48.989	43.841	41.315
	15:20	48.858	43.678	41.188
	15:25	48.727	43.516	41.061
	15:30	48.596	43.356	40.934
	15:35	48.463	43.196	40.807
	15:40	48.331	43.038	40.680
	15:45	48.198	42.881	40.552
	15:50	48.065	42.725	40.424
	15:55	47.932	42.570	40.295
	16:00	47.798	42.417	40.166
	16:05	47.663	42.264	40.036
	16:10	47.528	42.113	39.906
	16:15	47.393	41.963	39.775
	16:20	47.257	41.814	39.643
	16:25	47.121	41.666	39.510
	16:30	46.985	41.519	39.375
	16:35	46.848	41.374	39.240
	16:40	46.710	41.230	39.103
	16:45	46.572	41.086	38.964
	16:50	46.434	40.944	38.824
	16:55	46.296	40.804	38.682
	17:00	46.156	40.664	38.537
	17:05	46.017	40.525	38.391
	17:10	45.877	40.388	38.242
	17:15	45.737	40.251	38.090
	17:20	45.596	40.116	37.936
	17:25	45.456	39.982	37.777
	17:30	45.314	39.849	37.616
	17:35	45.173	39.717	37.451
	17:40	45.031	39.586	37.283
	17:45	44.888	39.456	37.112
	17:50	44.746	39.328	36.938
	17:55	44.603	39.200	36.761
	18:00	44.460	39.073	36.581
	18:05	44.316	38.948	36.398
	18:10	44.172	38.823	36.213
	18:15	44.029	38.700	36.025
	18:20	43.884	38.577	35.835
	18:25	43.740	38.455	35.642
	18:30	43.595	38.335	35.447
	18:35	43.451	38.215	35.250
	18:40	43.306	38.097	35.051
	18:45	43.161	37.979	34.850
	18:50	43.016	37.863	34.648
	18:55	42.870	37.747	34.444
	19:00	42.724	37.632	34.239
	19:05	42.579	37.518	34.032
	19:10	42.433	37.405	33.824
	19:15	42.288	37.293	33.615
	19:20	42.142	37.182	33.405
	19:25	41.996	37.072	33.194
	19:30	41.851	36.962	32.982
	19:35	41.705	36.854	32.770
	19:40	41.559	36.746	32.556
	19:45	41.414	36.639	32.342
	19:50	41.268	36.533	32.128
	19:55	41.123	36.427	31.913
	20:00	40.978	36.323	31.697
	20:05	40.832	36.219	31.481
	20:10	40.687	36.116	31.264
	20:15	40.542	36.014	31.046
	20:20	40.398	35.913	30.827
	20:25	40.254	35.812	30.608
	20:30	40.110	35.712	30.388
	20:35	39.966	35.613	30.167
	20:40	39.822	35.514	29.944
	20:45	39.679	35.416	29.721
	20:50	39.536	35.319	29.495
	20:55	39.393	35.222	29.268
	21:00	39.250	35.126	29.039
	21:05	39.108	35.031	28.808
	21:10	38.967	34.937	28.574
	21:15	38.825	34.843	28.337
	21:20	38.684	34.749	28.097
	21:25	38.544	34.656	27.854
	21:30	38.404	34.564	27.606
	21:35	38.264	34.472	27.355
	21:40	38.125	34.381	27.099
	21:45	37.987	34.291	26.837
	21:50	37.848	34.201	26.570
	21:55	37.711	34.111	26.297
	22:00	37.574	34.022	26.018
	22:05	37.437	33.934	25.733
	22:10	37.301	33.846	25.440
	22:15	37.166	33.758	25.139
	22:20	37.031	33.671	24.831
	22:25	36.897	33.585	24.514
	22:30	36.763	33.498	24.190
	22:35	36.630	33.413	23.856
	22:40	36.497	33.327	23.514
	22:45	36.366	33.242	23.163
	22:50	36.235	33.158	22.803
	22:55	36.104	33.073	22.434
	23:00	35.974	32.990	22.056
	23:05	35.845	32.906	21.673
	23:10	35.717	32.823	21.280
	23:15	35.589	32.740	20.881
	23:20	35.462	32.657	20.475
	23:25	35.336	32.575	20.064
	23:30	35.210	32.493	19.649
	23:35	35.085	32.411	19.230
	23:40	34.961	32.330	18.809
	23:45	34.838	32.249	18.388
	23:50	34.715	32.167	17.966
	23:55	34.594	32.087	17.547

Masaka Hydrographs

	Time	100-Year	1000-Year	10000-Year
Day 9	0:00	34.473	32.006	17.130
	0:05	34.352	31.925	16.718
	0:10	34.233	31.845	16.312
	0:15	34.114	31.764	15.912
	0:20	33.996	31.684	15.521
	0:25	33.879	31.604	15.139
	0:30	33.763	31.524	14.767
	0:35	33.647	31.443	14.405
	0:40	33.532	31.363	14.056
	0:45	33.418	31.283	13.718
	0:50	33.305	31.203	13.393
	0:55	33.193	31.122	13.081
	1:00	33.081	31.042	12.781
	1:05	32.971	30.961	12.494
	1:10	32.861	30.880	12.220
	1:15	32.752	30.799	11.959
	1:20	32.643	30.718	11.709
	1:25	32.536	30.636	11.472
	1:30	32.429	30.554	11.245
	1:35	32.323	30.472	11.030
	1:40	32.218	30.389	10.825
	1:45	32.114	30.306	10.630
	1:50	32.010	30.222	10.444
	1:55	31.908	30.137	10.267
	2:00	31.806	30.052	10.098
	2:05	31.705	29.967	9.937
	2:10	31.605	29.880	9.783
	2:15	31.505	29.793	9.636
	2:20	31.407	29.704	9.495
	2:25	31.309	29.615	9.361
	2:30	31.212	29.524	9.231
	2:35	31.116	29.433	9.107
	2:40	31.020	29.340	8.987
	2:45	30.925	29.246	8.872
	2:50	30.831	29.150	8.760
	2:55	30.738	29.052	8.653
	3:00	30.645	28.953	8.549
	3:05	30.553	28.852	8.448
	3:10	30.462	28.749	8.350
	3:15	30.372	28.643	8.255
	3:20	30.283	28.536	8.162
	3:25	30.194	28.426	8.072
	3:30	30.106	28.315	7.985
	3:35	30.019	28.201	7.899
	3:40	29.932	28.086	7.815
	3:45	29.846	27.969	7.734
	3:50	29.761	27.850	7.654
	3:55	29.676	27.730	7.575
	4:00	29.592	27.607	7.498
	4:05	29.509	27.483	7.423
	4:10	29.427	27.358	7.349
	4:15	29.345	27.231	7.276
	4:20	29.264	27.102	7.205
	4:25	29.183	26.972	7.134
	4:30	29.103	26.841	7.065
	4:35	29.024	26.709	6.997
	4:40	28.945	26.575	6.930
	4:45	28.867	26.441	6.864
	4:50	28.790	26.305	6.798
	4:55	28.713	26.168	6.734
	5:00	28.637	26.031	6.670
	5:05	28.561	25.893	6.607
	5:10	28.486	25.753	6.545
	5:15	28.412	25.614	6.484
	5:20	28.338	25.473	6.423
	5:25	28.264	25.332	6.363
	5:30	28.192	25.191	6.303
	5:35	28.119	25.049	6.244
	5:40	28.048	24.907	6.186
	5:45	27.976	24.764	6.128
	5:50	27.906	24.621	6.071
	5:55	27.836	24.477	6.014
	6:00	27.766	24.333	5.957
	6:05	27.697	24.189	5.901
	6:10	27.628	24.044	5.846
	6:15	27.560	23.899	5.790
	6:20	27.492	23.753	5.736
	6:25	27.425	23.607	5.681
	6:30	27.358	23.461	5.627
	6:35	27.292	23.313	5.573
	6:40	27.226	23.165	5.519
	6:45	27.160	23.017	5.465
	6:50	27.095	22.867	5.412
	6:55	27.030	22.717	5.359
	7:00	26.966	22.565	5.306
	7:05	26.902	22.412	5.253
	7:10	26.839	22.258	5.200
	7:15	26.776	22.101	5.147
	7:20	26.713	21.944	5.094
	7:25	26.651	21.784	5.041
	7:30	26.589	21.622	4.988
	7:35	26.527	21.457	4.935
	7:40	26.466	21.290	4.881
	7:45	26.405	21.119	4.828
	7:50	26.345	20.946	4.773
	7:55	26.285	20.769	4.719
	8:00	26.225	20.588	4.663
	8:05	26.166	20.403	4.607
	8:10	26.108	20.213	4.550
	8:15	26.048	20.019	4.493
	8:20	25.989	19.820	4.434
	8:25	25.931	19.615	4.373
	8:30	25.873	19.405	4.311
	8:35	25.815	19.189	4.247
	8:40	25.758	18.967	4.181
	8:45	25.701	18.738	4.112
	8:50	25.644	18.503	4.041
	8:55	25.588	18.261	3.966
	9:00	25.532	18.013	3.888
	9:05	25.476	17.757	3.805
	9:10	25.420	17.495	3.718
	9:15	25.365	17.227	3.626
	9:20	25.310	16.951	3.529
	9:25	25.255	16.670	3.425
	9:30	25.200	16.383	3.315
	9:35	25.146	16.090	3.199
	9:40	25.092	15.792	3.076
	9:45	25.038	15.491	2.945
	9:50	24.984	15.185	2.808
	9:55	24.931	14.877	2.665
	10:00	24.877	14.566	2.515
	10:05	24.824	14.255	2.360
	10:10	24.772	13.944	2.201
	10:15	24.719	13.633	2.039
	10:20	24.667	13.324	1.876
	10:25	24.615	13.018	1.713
	10:30	24.563	12.715	1.552
	10:35	24.511	12.417	1.394
	10:40	24.459	12.125	1.243
	10:45	24.408	11.839	1.098
	10:50	24.357	11.560	0.962
	10:55	24.306	11.289	0.836
	11:00	24.255	11.025	0.719
	11:05	24.204	10.771	0.614
	11:10	24.154	10.525	0.519
	11:15	24.104	10.288	0.435
	11:20	24.054	10.061	0.361
	11:25	24.004	9.843	0.297
	11:30	23.954	9.634	0.241
	11:35	23.904	9.434	0.194
	11:40	23.855	9.243	0.154
	11:45	23.806	9.061	0.120
	11:50	23.757	8.887	0.091
	11:55	23.708	8.721	0.067

Masaka Hydrographs

	Time	100-Year	1000-Year	10000-Year
Day 9	12:00	23.659	8.563	0.047
	12:05	23.610	8.412	0.031
	12:10	23.562	8.269	0.018
	12:15	23.513	8.132	0.007
	12:20	23.465	8.001	0.003
	12:25	23.417	7.877	0.001
	12:30	23.369	7.757	0.000
	12:35	23.321	7.643	0.000
	12:40	23.273	7.534	0.000
	12:45	23.226	7.429	0.000
	12:50	23.178	7.329	0.000
	12:55	23.131	7.232	0.000
	13:00	23.084	7.139	0.000
	13:05	23.037	7.050	0.000
	13:10	22.990	6.963	0.000
	13:15	22.943	6.880	0.000
	13:20	22.896	6.799	0.000
	13:25	22.849	6.721	0.000
	13:30	22.803	6.645	0.000
	13:35	22.756	6.571	0.000
	13:40	22.710	6.499	0.000
	13:45	22.663	6.430	0.000
	13:50	22.617	6.362	0.000
	13:55	22.571	6.296	0.000
	14:00	22.525	6.231	0.000
	14:05	22.479	6.168	0.000
	14:10	22.433	6.106	0.000
	14:15	22.387	6.045	0.000
	14:20	22.341	5.986	0.000
	14:25	22.295	5.928	0.000
	14:30	22.249	5.871	0.000
	14:35	22.203	5.815	0.000
	14:40	22.157	5.760	0.000
	14:45	22.111	5.706	0.000
	14:50	22.066	5.653	0.000
	14:55	22.020	5.601	0.000
	15:00	21.974	5.549	0.000
	15:05	21.928	5.498	0.000
	15:10	21.882	5.448	0.000
	15:15	21.836	5.399	0.000
	15:20	21.790	5.350	0.000
	15:25	21.744	5.302	0.000
	15:30	21.697	5.255	0.000
	15:35	21.651	5.208	0.000
	15:40	21.605	5.161	0.000
	15:45	21.558	5.115	0.000
	15:50	21.511	5.070	0.000
	15:55	21.465	5.025	0.000
	16:00	21.418	4.981	0.000
	16:05	21.370	4.937	0.000
	16:10	21.323	4.894	0.000
	16:15	21.275	4.850	0.000
	16:20	21.227	4.808	0.000
	16:25	21.179	4.765	0.000
	16:30	21.131	4.723	0.000
	16:35	21.082	4.681	0.000
	16:40	21.033	4.640	0.000
	16:45	20.983	4.599	0.000
	16:50	20.933	4.558	0.000
	16:55	20.883	4.517	0.000
	17:00	20.832	4.477	0.000
	17:05	20.780	4.437	0.000
	17:10	20.728	4.397	0.000
	17:15	20.676	4.357	0.000
	17:20	20.622	4.317	0.000
	17:25	20.569	4.278	0.000
	17:30	20.514	4.238	0.000
	17:35	20.458	4.199	0.000
	17:40	20.402	4.160	0.000
	17:45	20.345	4.121	0.000
	17:50	20.286	4.081	0.000
	17:55	20.227	4.042	0.000
	18:00	20.167	4.003	0.000
	18:05	20.106	3.964	0.000
	18:10	20.042	3.924	0.000
	18:15	19.978	3.885	0.000
	18:20	19.912	3.845	0.000
	18:25	19.846	3.805	0.000
	18:30	19.778	3.764	0.000
	18:35	19.710	3.723	0.000
	18:40	19.640	3.682	0.000
	18:45	19.570	3.640	0.000
	18:50	19.498	3.597	0.000
	18:55	19.425	3.553	0.000
	19:00	19.352	3.509	0.000
	19:05	19.277	3.463	0.000
	19:10	19.202	3.415	0.000
	19:15	19.126	3.366	0.000
	19:20	19.049	3.316	0.000
	19:25	18.972	3.263	0.000
	19:30	18.893	3.207	0.000
	19:35	18.814	3.149	0.000
	19:40	18.735	3.088	0.000
	19:45	18.655	3.024	0.000
	19:50	18.574	2.956	0.000
	19:55	18.493	2.883	0.000
	20:00	18.411	2.806	0.000
	20:05	18.329	2.724	0.000
	20:10	18.247	2.637	0.000
	20:15	18.164	2.545	0.000
	20:20	18.081	2.447	0.000
	20:25	17.998	2.343	0.000
	20:30	17.914	2.234	0.000
	20:35	17.831	2.120	0.000
	20:40	17.747	2.001	0.000
	20:45	17.663	1.877	0.000
	20:50	17.579	1.750	0.000
	20:55	17.495	1.621	0.000
	21:00	17.411	1.491	0.000
	21:05	17.327	1.361	0.000
	21:10	17.243	1.233	0.000
	21:15	17.160	1.108	0.000
	21:20	17.076	0.987	0.000
	21:25	16.992	0.872	0.000
	21:30	16.909	0.763	0.000
	21:35	16.825	0.662	0.000
	21:40	16.742	0.570	0.000
	21:45	16.658	0.486	0.000
	21:50	16.575	0.410	0.000
	21:55	16.492	0.343	0.000
	22:00	16.410	0.284	0.000
	22:05	16.327	0.232	0.000
	22:10	16.244	0.187	0.000
	22:15	16.161	0.149	0.000
	22:20	16.079	0.117	0.000
	22:25	15.996	0.090	0.000
	22:30	15.914	0.066	0.000
	22:35	15.831	0.046	0.000
	22:40	15.749	0.031	0.000
	22:45	15.666	0.018	0.000
	22:50	15.583	0.007	0.000
	22:55	15.500	0.003	0.000
	23:00	15.416	0.001	0.000
	23:05	15.332	0.000	0.000
	23:10	15.248	0.000	0.000
	23:15	15.162	0.000	0.000
	23:20	15.077	0.000	0.000
	23:25	14.990	0.000	0.000
	23:30	14.903	0.000	0.000
	23:35	14.815	0.000	0.000
	23:40	14.725	0.000	0.000
	23:45	14.635	0.000	0.000
	23:50	14.543	0.000	0.000
	23:55	14.449	0.000	0.000

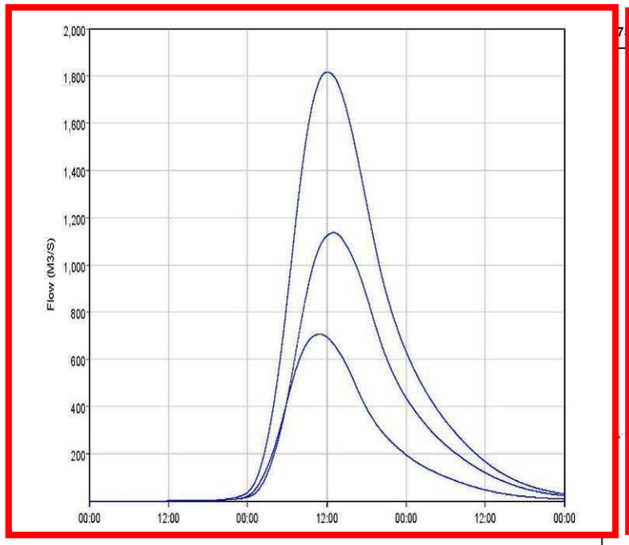
Masaka Hydrographs

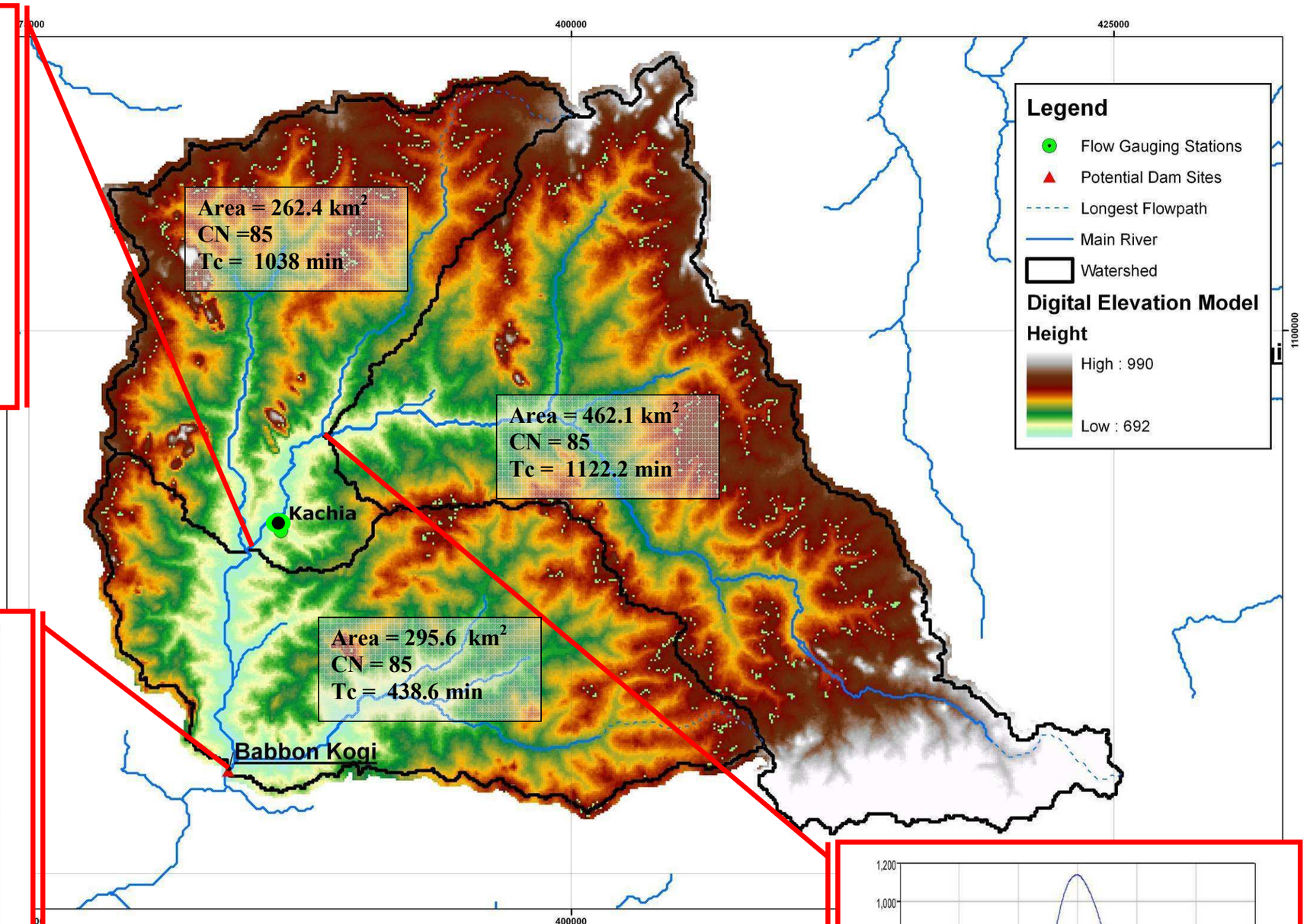
	Time	100-Year	1000-Year	10000-Year
Day 10	0:00	14.354	0.000	0.000
	0:05	14.257	0.000	0.000
	0:10	14.158	0.000	0.000
	0:15	14.057	0.000	0.000
	0:20	13.954	0.000	0.000
	0:25	13.848	0.000	0.000
	0:30	13.740	0.000	0.000
	0:35	13.629	0.000	0.000
	0:40	13.514	0.000	0.000
	0:45	13.397	0.000	0.000
	0:50	13.276	0.000	0.000
	0:55	13.151	0.000	0.000
	1:00	13.023	0.000	0.000
	1:05	12.891	0.000	0.000
	1:10	12.756	0.000	0.000
	1:15	12.616	0.000	0.000
	1:20	12.472	0.000	0.000
	1:25	12.323	0.000	0.000
	1:30	12.171	0.000	0.000
	1:35	12.014	0.000	0.000
	1:40	11.853	0.000	0.000
	1:45	11.687	0.000	0.000
	1:50	11.518	0.000	0.000
	1:55	11.344	0.000	0.000
	2:00	11.167	0.000	0.000
	2:05	10.987	0.000	0.000
	2:10	10.803	0.000	0.000
	2:15	10.616	0.000	0.000
	2:20	10.427	0.000	0.000
	2:25	10.236	0.000	0.000
	2:30	10.043	0.000	0.000
	2:35	9.850	0.000	0.000
	2:40	9.656	0.000	0.000
	2:45	9.462	0.000	0.000
	2:50	9.268	0.000	0.000
	2:55	9.076	0.000	0.000
	3:00	8.885	0.000	0.000
	3:05	8.697	0.000	0.000
	3:10	8.511	0.000	0.000
	3:15	8.329	0.000	0.000
	3:20	8.150	0.000	0.000
	3:25	7.975	0.000	0.000
	3:30	7.805	0.000	0.000
	3:35	7.640	0.000	0.000
	3:40	7.479	0.000	0.000
	3:45	7.324	0.000	0.000
	3:50	7.174	0.000	0.000
	3:55	7.030	0.000	0.000
	4:00	6.890	0.000	0.000
	4:05	6.757	0.000	0.000
	4:10	6.628	0.000	0.000
	4:15	6.505	0.000	0.000
	4:20	6.387	0.000	0.000
	4:25	6.274	0.000	0.000
	4:30	6.166	0.000	0.000
	4:35	6.063	0.000	0.000
	4:40	5.964	0.000	0.000
	4:45	5.870	0.000	0.000
	4:50	5.779	0.000	0.000
	4:55	5.693	0.000	0.000
	5:00	5.610	0.000	0.000
	5:05	5.530	0.000	0.000
	5:10	5.454	0.000	0.000
	5:15	5.381	0.000	0.000
	5:20	5.310	0.000	0.000
	5:25	5.243	0.000	0.000
	5:30	5.178	0.000	0.000
	5:35	5.115	0.000	0.000
	5:40	5.054	0.000	0.000
	5:45	4.996	0.000	0.000
	5:50	4.939	0.000	0.000
	5:55	4.885	0.000	0.000
	6:00	4.832	0.000	0.000
	6:05	4.780	0.000	0.000
	6:10	4.730	0.000	0.000
	6:15	4.681	0.000	0.000
	6:20	4.634	0.000	0.000
	6:25	4.588	0.000	0.000
	6:30	4.543	0.000	0.000
	6:35	4.499	0.000	0.000
	6:40	4.456	0.000	0.000
	6:45	4.414	0.000	0.000
	6:50	4.373	0.000	0.000
	6:55	4.333	0.000	0.000
	7:00	4.293	0.000	0.000
	7:05	4.255	0.000	0.000
	7:10	4.217	0.000	0.000
	7:15	4.179	0.000	0.000
	7:20	4.143	0.000	0.000
	7:25	4.107	0.000	0.000
	7:30	4.071	0.000	0.000
	7:35	4.036	0.000	0.000
	7:40	4.002	0.000	0.000
	7:45	3.968	0.000	0.000
	7:50	3.935	0.000	0.000
	7:55	3.902	0.000	0.000
	8:00	3.869	0.000	0.000
	8:05	3.837	0.000	0.000
	8:10	3.805	0.000	0.000
	8:15	3.774	0.000	0.000
	8:20	3.743	0.000	0.000
	8:25	3.713	0.000	0.000
	8:30	3.682	0.000	0.000
	8:35	3.652	0.000	0.000
	8:40	3.623	0.000	0.000
	8:45	3.594	0.000	0.000
	8:50	3.565	0.000	0.000
	8:55	3.536	0.000	0.000
	9:00	3.507	0.000	0.000
	9:05	3.479	0.000	0.000
	9:10	3.451	0.000	0.000
	9:15	3.423	0.000	0.000
	9:20	3.396	0.000	0.000
	9:25	3.368	0.000	0.000
	9:30	3.341	0.000	0.000
	9:35	3.314	0.000	0.000
	9:40	3.287	0.000	0.000
	9:45	3.261	0.000	0.000
	9:50	3.234	0.000	0.000
	9:55	3.208	0.000	0.000
	10:00	3.182	0.000	0.000
	10:05	3.155	0.000	0.000
	10:10	3.129	0.000	0.000
	10:15	3.104	0.000	0.000
	10:20	3.078	0.000	0.000
	10:25	3.052	0.000	0.000
	10:30	3.026	0.000	0.000
	10:35	3.001	0.000	0.000
	10:40	2.975	0.000	0.000
	10:45	2.949	0.000	0.000
	10:50	2.924	0.000	0.000
	10:55	2.898	0.000	0.000
	11:00	2.872	0.000	0.000
	11:05	2.847	0.000	0.000
	11:10	2.821	0.000	0.000
	11:15	2.795	0.000	0.000
	11:20	2.768	0.000	0.000
	11:25	2.742	0.000	0.000
	11:30	2.715	0.000	0.000
	11:35	2.688	0.000	0.000
	11:40	2.661	0.000	0.000
	11:45	2.633	0.000	0.000
	11:50	2.604	0.000	0.000
	11:55	2.575	0.000	0.000

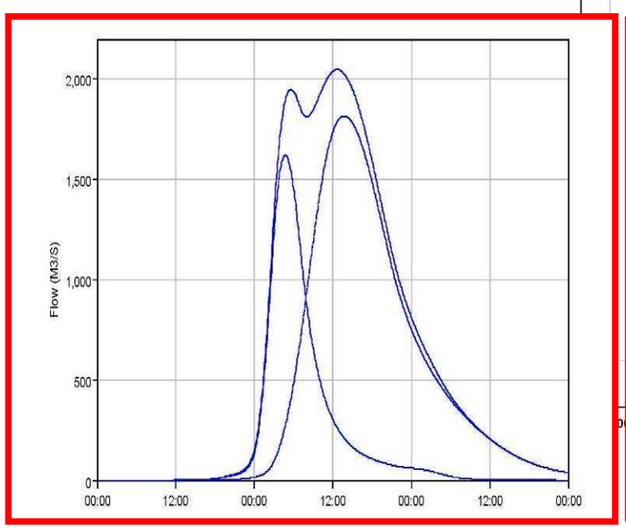
Masaka Hydrographs

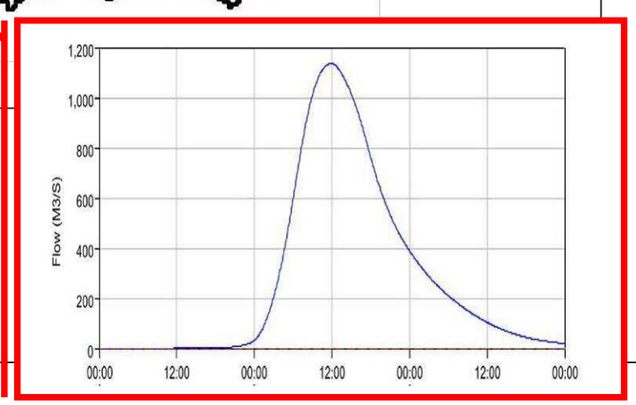
	Time	100-Year	1000-Year	10000-Year
Day 10	12:00	2.545	0.000	0.000
	12:05	2.514	0.000	0.000
	12:10	2.482	0.000	0.000
	12:15	2.449	0.000	0.000
	12:20	2.414	0.000	0.000
	12:25	2.378	0.000	0.000
	12:30	2.340	0.000	0.000
	12:35	2.300	0.000	0.000
	12:40	2.258	0.000	0.000
	12:45	2.213	0.000	0.000
	12:50	2.165	0.000	0.000
	12:55	2.115	0.000	0.000
	13:00	2.061	0.000	0.000
	13:05	2.003	0.000	0.000
	13:10	1.942	0.000	0.000
	13:15	1.876	0.000	0.000
	13:20	1.807	0.000	0.000
	13:25	1.733	0.000	0.000
	13:30	1.655	0.000	0.000
	13:35	1.574	0.000	0.000
	13:40	1.488	0.000	0.000
	13:45	1.399	0.000	0.000
	13:50	1.308	0.000	0.000
	13:55	1.214	0.000	0.000
	14:00	1.120	0.000	0.000
	14:05	1.026	0.000	0.000
	14:10	0.931	0.000	0.000
	14:15	0.838	0.000	0.000
	14:20	0.749	0.000	0.000
	14:25	0.663	0.000	0.000
	14:30	0.582	0.000	0.000
	14:35	0.508	0.000	0.000
	14:40	0.436	0.000	0.000
	14:45	0.372	0.000	0.000
	14:50	0.314	0.000	0.000
	14:55	0.262	0.000	0.000
	15:00	0.216	0.000	0.000
	15:05	0.176	0.000	0.000
	15:10	0.140	0.000	0.000
	15:15	0.110	0.000	0.000
	15:20	0.086	0.000	0.000
	15:25	0.063	0.000	0.000
	15:30	0.044	0.000	0.000
	15:35	0.027	0.000	0.000
	15:40	0.015	0.000	0.000
	15:45	0.006	0.000	0.000
	15:50	0.002	0.000	0.000
	15:55	0.001	0.000	0.000
	16:00	0.000	0.000	0.000

2- Upper Gurara River Hydrologic Simulation









6.1 Babbon Kogi hydrographs

Babbon Kogi Hydrographs

Day	Time	100-Year	1000-Year	10000-Year
Day 1	0:00	0.000	0.000	0.000
	0:05	0.000	0.000	0.001
	0:10	0.000	0.000	0.001
	0:15	0.000	0.000	0.002
	0:20	0.000	0.000	0.002
	0:25	0.000	0.000	0.003
	0:30	0.000	0.000	0.004
	0:35	0.000	0.000	0.005
	0:40	0.000	0.000	0.007
	0:45	0.000	0.000	0.009
	0:50	0.000	0.000	0.011
	0:55	0.000	0.000	0.014
	1:00	0.000	0.000	0.017
	1:05	0.000	0.000	0.020
	1:10	0.000	0.000	0.024
	1:15	0.000	0.000	0.028
	1:20	0.000	0.000	0.033
	1:25	0.000	0.000	0.039
	1:30	0.000	0.000	0.046
	1:35	0.000	0.000	0.053
	1:40	0.000	0.000	0.061
	1:45	0.000	0.000	0.069
	1:50	0.000	0.000	0.079
	1:55	0.000	0.000	0.089
	2:00	0.000	0.000	0.101
	2:05	0.000	0.000	0.114
	2:10	0.000	0.000	0.127
	2:15	0.000	0.000	0.142
	2:20	0.000	0.000	0.159
	2:25	0.000	0.000	0.177
	2:30	0.000	0.000	0.196
	2:35	0.000	0.000	0.216
	2:40	0.000	0.000	0.239
	2:45	0.000	0.000	0.263
	2:50	0.000	0.001	0.288
	2:55	0.000	0.001	0.316
	3:00	0.000	0.001	0.346
	3:05	0.000	0.002	0.377
	3:10	0.000	0.002	0.411
	3:15	0.000	0.003	0.446
	3:20	0.000	0.004	0.484
	3:25	0.000	0.005	0.525
	3:30	0.000	0.006	0.567
	3:35	0.000	0.008	0.612
	3:40	0.000	0.010	0.660
	3:45	0.000	0.012	0.709
	3:50	0.000	0.015	0.762
	3:55	0.000	0.018	0.817
	4:00	0.000	0.021	0.875
	4:05	0.000	0.025	0.935
	4:10	0.000	0.029	0.998
	4:15	0.000	0.034	1.064
	4:20	0.000	0.039	1.133
	4:25	0.000	0.045	1.204
	4:30	0.000	0.051	1.279
	4:35	0.000	0.058	1.356
	4:40	0.000	0.066	1.435
	4:45	0.000	0.075	1.518
	4:50	0.000	0.084	1.603
	4:55	0.000	0.094	1.692
	5:00	0.000	0.106	1.783
	5:05	0.000	0.118	1.876
	5:10	0.000	0.131	1.973
	5:15	0.000	0.145	2.073
	5:20	0.000	0.161	2.175
	5:25	0.000	0.178	2.280
	5:30	0.000	0.196	2.388
	5:35	0.000	0.215	2.499
	5:40	0.000	0.236	2.612
	5:45	0.000	0.258	2.729
	5:50	0.000	0.281	2.848
	5:55	0.000	0.307	2.970
	6:00	0.000	0.333	3.095
	6:05	0.000	0.362	3.223
	6:10	0.000	0.392	3.353
	6:15	0.000	0.424	3.487
	6:20	0.000	0.458	3.622
	6:25	0.000	0.493	3.761
	6:30	0.000	0.531	3.902
	6:35	0.000	0.570	4.046
	6:40	0.001	0.612	4.193
	6:45	0.001	0.655	4.342
	6:50	0.001	0.701	4.493
	6:55	0.002	0.749	4.647
	7:00	0.002	0.798	4.804
	7:05	0.003	0.850	4.963
	7:10	0.004	0.904	5.125
	7:15	0.005	0.960	5.289
	7:20	0.006	1.019	5.455
	7:25	0.007	1.079	5.624
	7:30	0.009	1.142	5.795
	7:35	0.011	1.207	5.968
	7:40	0.013	1.274	6.144
	7:45	0.015	1.344	6.322
	7:50	0.018	1.416	6.502
	7:55	0.021	1.489	6.684
	8:00	0.024	1.566	6.869
	8:05	0.028	1.644	7.055
	8:10	0.033	1.724	7.243
	8:15	0.037	1.807	7.434
	8:20	0.043	1.892	7.626
	8:25	0.048	1.979	7.821
	8:30	0.055	2.069	8.017
	8:35	0.062	2.160	8.215
	8:40	0.069	2.254	8.415
	8:45	0.078	2.350	8.617
	8:50	0.086	2.447	8.819
	8:55	0.096	2.546	9.022
	9:00	0.106	2.647	9.226
	9:05	0.117	2.749	9.430
	9:10	0.128	2.853	9.635
	9:15	0.141	2.958	9.841
	9:20	0.154	3.065	10.047
	9:25	0.167	3.172	10.252
	9:30	0.182	3.281	10.456
	9:35	0.197	3.390	10.659
	9:40	0.212	3.499	10.861
	9:45	0.229	3.609	11.062
	9:50	0.246	3.720	11.262
	9:55	0.264	3.831	11.461
	10:00	0.282	3.943	11.657
	10:05	0.302	4.054	11.852
	10:10	0.322	4.166	12.045
	10:15	0.343	4.278	12.236
	10:20	0.364	4.389	12.425
	10:25	0.387	4.501	12.612
	10:30	0.409	4.612	12.796
	10:35	0.433	4.722	12.977
	10:40	0.457	4.831	13.154
	10:45	0.482	4.940	13.328
	10:50	0.507	5.048	13.499
	10:55	0.533	5.154	13.666
	11:00	0.560	5.260	13.830
	11:05	0.586	5.364	13.989
	11:10	0.614	5.466	14.142
	11:15	0.641	5.565	14.291
	11:20	0.669	5.663	14.435
	11:25	0.697	5.759	14.574
	11:30	0.725	5.853	14.707
	11:35	0.754	5.943	14.835
	11:40	0.782	6.032	14.956
	11:45	0.811	6.117	15.071
	11:50	0.839	6.199	15.179
	11:55	0.867	6.278	15.281

Babbon Kogi Hydrographs

Day	Time	100-Year	1000-Year	10000-Year
Day 1	12:00	25.916	52.589	86.778
	12:05	27.345	54.890	90.054
	12:10	28.886	57.361	93.558
	12:15	30.548	60.011	97.306
	12:20	32.338	62.852	101.309
	12:25	34.276	65.912	105.607
	12:30	36.374	69.210	110.226
	12:35	38.645	72.761	115.186
	12:40	41.126	76.622	120.557
	12:45	43.833	80.809	126.362
	12:50	46.785	85.350	132.636
	12:55	50.005	90.279	139.423
	13:00	53.512	95.621	146.754
	13:05	57.356	101.443	154.716
	13:10	61.601	107.831	163.417
	13:15	66.278	114.828	172.909
	13:20	71.421	122.472	183.237
	13:25	77.033	130.770	194.407
	13:30	83.203	139.836	206.564
	13:35	90.163	149.982	220.098
	13:40	98.574	162.077	236.093
	13:45	107.730	175.179	253.360
	13:50	117.566	189.194	271.780
	13:55	128.155	204.220	291.474
	14:00	139.702	220.532	312.787
	14:05	152.859	238.986	336.788
	14:10	167.185	258.993	362.730
	14:15	182.311	280.057	389.988
	14:20	198.234	302.171	418.555
	14:25	215.042	325.456	448.581
	14:30	232.984	350.240	480.480
	14:35	252.106	376.584	514.321
	14:40	272.030	403.976	549.460
	14:45	292.712	432.358	585.823
	14:50	314.229	461.832	623.535
	14:55	336.812	492.705	662.984
	15:00	360.998	525.684	705.049
	15:05	386.057	559.796	748.507
	15:10	411.902	594.922	793.207
	15:15	438.650	631.215	839.340
	15:20	466.417	668.828	887.094
	15:25	495.815	708.566	937.473
	15:30	526.258	749.643	989.487
	15:35	557.371	791.560	1042.507
	15:40	589.121	834.271	1096.473
	15:45	621.514	877.779	1151.389
	15:50	654.819	922.438	1207.693
	15:55	688.978	968.167	1265.280
	16:00	723.436	1014.229	1323.230
	16:05	758.119	1060.529	1381.423
	16:10	792.898	1106.890	1439.636
	16:15	827.483	1152.927	1497.385
	16:20	861.404	1198.021	1553.900
	16:25	895.154	1242.829	1610.008
	16:30	928.658	1287.256	1665.591
	16:35	961.737	1331.064	1720.353
	16:40	994.023	1373.765	1773.681
	16:45	1024.571	1414.110	1824.018
	16:50	1054.111	1453.075	1872.592
	16:55	1082.916	1491.024	1919.860
	17:00	1110.933	1527.893	1965.745
	17:05	1137.926	1563.367	2009.852
	17:10	1163.193	1596.518	2051.024
	17:15	1186.848	1627.504	2089.464
	17:20	1209.630	1657.308	2126.402
	17:25	1231.612	1686.028	2161.963
	17:30	1252.660	1713.486	2195.925
	17:35	1272.321	1739.079	2227.531
	17:40	1289.937	1761.944	2255.710
	17:45	1306.578	1783.505	2282.246
	17:50	1322.360	1803.918	2307.337
	17:55	1337.236	1823.120	2330.906
	18:00	1351.066	1840.929	2352.725
	18:05	1363.476	1856.850	2372.178
	18:10	1374.913	1871.480	2390.016
	18:15	1385.553	1885.055	2406.534
	18:20	1395.413	1897.599	2421.766
	18:25	1404.299	1908.854	2435.388
	18:30	1411.479	1917.856	2446.197
	18:35	1417.215	1924.957	2454.641
	18:40	1422.213	1931.094	2461.891
	18:45	1426.493	1936.297	2467.986
	18:50	1429.998	1940.488	2472.829
	18:55	1432.645	1943.558	2476.282
	19:00	1434.397	1945.460	2478.291
	19:05	1435.517	1946.544	2479.293
	19:10	1436.052	1946.873	2479.365
	19:15	1436.006	1946.450	2478.515
	19:20	1435.372	1945.265	2476.726
	19:25	1434.055	1943.194	2473.843
	19:30	1432.281	1940.535	2470.241
	19:35	1430.069	1937.314	2465.952
	19:40	1427.437	1933.556	2461.008
	19:45	1424.419	1929.306	2455.463
	19:50	1420.728	1924.182	2448.844
	19:55	1416.480	1918.342	2441.346
	20:00	1411.896	1912.080	2433.340
	20:05	1407.011	1905.442	2424.884
	20:10	1401.836	1898.444	2415.997
	20:15	1396.253	1890.930	2406.485
	20:20	1390.179	1882.793	2396.217
	20:25	1384.073	1874.641	2385.955
	20:30	1378.001	1866.560	2375.801
	20:35	1371.986	1858.579	2365.795
	20:40	1366.209	1850.940	2356.234
	20:45	1361.141	1844.259	2347.889
	20:50	1356.438	1838.079	2340.184
	20:55	1352.122	1832.427	2333.149
	21:00	1348.185	1827.287	2326.764
	21:05	1344.725	1822.792	2321.195
	21:10	1342.221	1819.571	2317.226
	21:15	1340.373	1817.224	2314.352
	21:20	1338.907	1815.385	2312.114
	21:25	1337.786	1814.004	2310.448
	21:30	1336.994	1813.058	2309.327
	21:35	1336.685	1812.751	2309.004
	21:40	1336.923	1813.166	2309.581
	21:45	1337.506	1814.037	2310.724
	21:50	1338.413	1815.331	2312.393
	21:55	1339.688	1817.108	2314.662
	22:00	1341.446	1819.522	2317.722
	22:05	1343.862	1822.798	2321.854
	22:10	1346.610	1826.506	2326.520
	22:15	1349.611	1830.542	2331.587
	22:20	1352.872	1834.911	2337.063
	22:25	1356.424	1839.657	2343.002
	22:30	1360.399	1844.953	2349.618
	22:35	1364.551	1850.471	2356.503
	22:40	1368.810	1856.117	2363.537
	22:45	1373.201	1861.927	2370.766
	22:50	1377.724	1867.899	2378.187
	22:55	1382.378	1874.033	2385.800
	23:00	1387.130	1880.286	2393.553
	23:05	1391.906	1886.559	2401.322
	23:10	1396.642	1892.769	2409.003
	23:15	1401.391	1898.988	2416.687
	23:20	1406.254	1905.347	2424.540
	23:25	1411.320	1911.966	2432.707
	23:30	1416.395	1918.585	2440.867
	23:35	1421.342	1925.024	2448.792
	23:40	1426.202	1931.337	2456.551
	23:45	1431.036	1937.604	2464.243
	23:50	1435.841	1943.824	2471.867
	23:55	1440.605	1949.980	2479.403

Babbon Kogi Hydrographs

Day	Time	100-Year	1000-Year	10000-Year
Day 2	0:00	1445.323	1956.066	2486.845
	0:05	1449.994	1962.081	2494.190
	0:10	1454.591	1967.989	2501.394
	0:15	1459.146	1973.835	2508.513
	0:20	1463.634	1979.585	2515.506
	0:25	1467.987	1985.145	2522.255
	0:30	1472.214	1990.532	2528.781
	0:35	1476.243	1995.649	2534.962
	0:40	1480.026	2000.434	2540.723
	0:45	1483.632	2004.978	2546.175
	0:50	1487.111	2009.347	2551.405
	0:55	1490.455	2013.532	2556.400
	1:00	1493.663	2017.532	2561.157
	1:05	1496.754	2021.370	2565.709
	1:10	1499.824	2025.176	2570.216
	1:15	1502.765	2028.806	2574.498
	1:20	1505.466	2032.113	2578.371
	1:25	1507.858	2035.005	2581.722
	1:30	1509.996	2037.557	2584.645
	1:35	1511.942	2039.851	2587.241
	1:40	1513.656	2041.836	2589.448
	1:45	1515.154	2043.529	2591.286
	1:50	1516.468	2044.975	2592.813
	1:55	1517.622	2046.204	2594.064
	2:00	1518.651	2047.264	2595.099
	2:05	1519.592	2048.201	2595.976
	2:10	1520.358	2048.902	2596.554
	2:15	1520.942	2049.355	2596.817
	2:20	1521.333	2049.550	2596.753
	2:25	1521.486	2049.424	2596.285
	2:30	1521.319	2048.871	2595.278
	2:35	1520.804	2047.852	2593.689
	2:40	1519.955	2046.390	2591.543
	2:45	1518.779	2044.494	2588.853
	2:50	1517.362	2042.279	2585.764
	2:55	1515.813	2039.889	2582.456
	3:00	1514.124	2037.313	2578.914
	3:05	1512.264	2034.509	2575.087
	3:10	1510.242	2031.489	2570.989
	3:15	1508.063	2028.259	2566.628
	3:20	1505.730	2024.826	2562.010
	3:25	1503.247	2021.192	2557.142
	3:30	1500.613	2017.358	2552.021
	3:35	1497.804	2013.290	2546.608
	3:40	1494.798	2008.961	2540.867
	3:45	1491.614	2004.395	2534.829
	3:50	1488.328	1999.692	2528.618
	3:55	1484.910	1994.811	2522.183
	4:00	1481.352	1989.745	2515.515
	4:05	1477.661	1984.499	2508.621
	4:10	1473.832	1979.069	2501.494
	4:15	1469.862	1973.450	2494.129
	4:20	1465.743	1967.631	2486.513
	4:25	1461.474	1961.612	2478.645
	4:30	1457.059	1955.397	2470.530
	4:35	1452.497	1948.986	2462.169
	4:40	1447.763	1942.345	2453.519
	4:45	1442.769	1935.360	2444.438
	4:50	1437.463	1927.959	2434.837
	4:55	1431.939	1920.272	2424.879
	5:00	1426.259	1912.380	2414.665
	5:05	1420.422	1904.280	2404.195
	5:10	1414.431	1895.979	2393.473
	5:15	1408.296	1887.488	2382.516
	5:20	1402.026	1878.820	2371.337
	5:25	1395.627	1869.980	2359.946
	5:30	1389.106	1860.982	2348.357
	5:35	1382.487	1851.855	2336.608
	5:40	1375.763	1842.590	2324.687
	5:45	1368.920	1833.166	2312.568
	5:50	1361.906	1823.518	2300.169
	5:55	1354.724	1813.647	2287.494
	6:00	1347.420	1803.618	2274.621
	6:05	1340.016	1793.456	2261.585
	6:10	1332.514	1783.170	2248.395
	6:15	1324.919	1772.759	2235.051
	6:20	1317.234	1762.233	2221.565
	6:25	1309.471	1751.604	2207.951
	6:30	1301.645	1740.893	2194.236
	6:35	1293.733	1730.071	2180.383
	6:40	1285.735	1719.134	2166.389
	6:45	1277.646	1708.080	2152.248
	6:50	1269.441	1696.872	2137.918
	6:55	1261.097	1685.484	2123.363
	7:00	1252.629	1673.933	2108.607
	7:05	1244.056	1662.246	2093.684
	7:10	1235.396	1650.448	2078.625
	7:15	1226.666	1638.559	2063.456
	7:20	1217.879	1626.598	2048.199
	7:25	1209.042	1614.575	2032.866
	7:30	1200.150	1602.481	2017.449
	7:35	1191.206	1590.322	2001.954
	7:40	1182.208	1578.096	1986.379
	7:45	1173.163	1565.810	1970.730
	7:50	1164.089	1553.488	1955.040
	7:55	1155.037	1541.200	1939.395
	8:00	1145.994	1528.926	1923.770
	8:05	1136.898	1516.585	1908.063
	8:10	1127.716	1504.132	1892.221
	8:15	1118.469	1491.596	1876.277
	8:20	1109.185	1479.016	1860.281
	8:25	1099.870	1466.398	1844.242
	8:30	1090.527	1453.747	1828.164
	8:35	1081.162	1441.072	1812.061
	8:40	1071.781	1428.380	1795.941
	8:45	1062.387	1415.676	1779.809
	8:50	1052.992	1402.973	1763.684
	8:55	1043.636	1390.328	1747.634
	9:00	1034.352	1377.782	1731.712
	9:05	1025.101	1365.283	1715.854
	9:10	1015.837	1352.772	1699.984
	9:15	1006.528	1340.205	1684.046
	9:20	997.163	1327.567	1668.025
	9:25	987.777	1314.907	1651.980
	9:30	978.393	1302.255	1635.951
	9:35	969.016	1289.619	1619.945
	9:40	959.648	1276.998	1603.965
	9:45	950.292	1264.400	1588.017
	9:50	940.958	1251.838	1572.120
	9:55	931.662	1239.330	1556.295
	10:00	922.429	1226.911	1540.588
	10:05	913.257	1214.579	1524.992
	10:10	904.131	1202.312	1509.484
	10:15	895.058	1190.122	1494.075
	10:20	886.073	1178.052	1478.822
	10:25	877.208	1166.145	1463.775
	10:30	868.444	1154.377	1448.906
	10:35	859.756	1142.714	1434.172
	10:40	851.140	1131.150	1419.566
	10:45	842.599	1119.689	1405.092
	10:50	834.133	1108.332	1390.752
	10:55	825.743	1097.079	1376.546
	11:00	817.441	1085.949	1362.497
	11:05	809.247	1074.965	1348.634
	11:10	801.153	1064.118	1334.948
	11:15	793.152	1053.398	1321.423
	11:20	785.246	1042.807	1308.062
	11:25	777.456	1032.373	1294.900
	11:30	769.829	1022.159	1282.018
	11:35	762.388	1012.193	1269.447
	11:40	755.084	1002.411	1257.109
	11:45	747.895	992.785	1244.966
	11:50	740.827	983.319	1233.027
	11:55	733.862	973.991	1221.260

Babbon Kogi Hydrographs

Day	Time	100-Year	1000-Year	10000-Year
Day 2	12:00	726.997	964.798	1209.665
	12:05	720.256	955.770	1198.276
	12:10	713.625	946.890	1187.075
	12:15	707.083	938.128	1176.024
	12:20	700.624	929.480	1165.114
	12:25	694.248	920.940	1154.342
	12:30	687.951	912.507	1143.704
	12:35	681.740	904.188	1133.210
	12:40	675.625	895.998	1122.878
	12:45	669.596	887.923	1112.692
	12:50	663.637	879.941	1102.622
	12:55	657.742	872.045	1092.661
	13:00	651.909	864.233	1082.806
	13:05	646.135	856.498	1073.048
	13:10	640.415	848.838	1063.385
	13:15	634.750	841.251	1053.814
	13:20	629.140	833.738	1044.339
	13:25	623.584	826.299	1034.956
	13:30	618.081	818.931	1025.663
	13:35	612.630	811.633	1016.460
	13:40	607.234	804.410	1007.352
	13:45	601.911	797.285	998.368
	13:50	596.668	790.268	989.520
	13:55	591.491	783.338	980.782
	14:00	586.367	776.481	972.137
	14:05	581.299	769.698	963.586
	14:10	576.298	763.007	955.150
	14:15	571.359	756.399	946.819
	14:20	566.470	749.858	938.575
	14:25	561.630	743.383	930.413
	14:30	556.836	736.971	922.331
	14:35	552.085	730.616	914.323
	14:40	547.373	724.316	906.383
	14:45	542.703	718.071	898.515
	14:50	538.089	711.903	890.743
	14:55	533.552	705.837	883.101
	15:00	529.077	699.856	875.565
	15:05	524.642	693.927	868.096
	15:10	520.238	688.041	860.680
	15:15	515.864	682.195	853.316
	15:20	511.518	676.387	846.000
	15:25	507.195	670.611	838.724
	15:30	502.890	664.860	831.483
	15:35	498.603	659.135	824.273
	15:40	494.333	653.432	817.093
	15:45	490.079	647.752	809.943
	15:50	485.839	642.093	802.820
	15:55	481.612	636.451	795.720
	16:00	477.395	630.825	788.641
	16:05	473.189	625.215	781.584
	16:10	469.002	619.631	774.560
	16:15	464.855	614.103	767.607
	16:20	460.745	608.625	760.718
	16:25	456.656	603.175	753.866
	16:30	452.584	597.748	747.044
	16:35	448.528	592.345	740.252
	16:40	444.489	586.966	733.491
	16:45	440.469	581.613	726.765
	16:50	436.468	576.286	720.072
	16:55	432.484	570.984	713.411
	17:00	428.520	565.708	706.783
	17:05	424.582	560.469	700.203
	17:10	420.684	555.283	693.690
	17:15	416.820	550.143	687.237
	17:20	412.981	545.036	680.824
	17:25	409.161	539.957	674.447
	17:30	405.361	534.905	668.104
	17:35	401.581	529.879	661.796
	17:40	397.823	524.884	655.526
	17:45	394.087	519.917	649.293
	17:50	390.371	514.979	643.096
	17:55	386.674	510.067	636.932
	18:00	382.997	505.181	630.802
	18:05	379.340	500.323	624.707
	18:10	375.702	495.492	618.647
	18:15	372.087	490.691	612.625
	18:20	368.505	485.935	606.661
	18:25	364.955	481.221	600.749
	18:30	361.431	476.543	594.883
	18:35	357.934	471.902	589.063
	18:40	354.464	467.296	583.290
	18:45	351.021	462.728	577.562
	18:50	347.605	458.196	571.881
	18:55	344.218	453.703	566.250
	19:00	340.862	449.252	560.672
	19:05	337.538	444.844	555.148
	19:10	334.246	440.478	549.679
	19:15	330.988	436.158	544.266
	19:20	327.774	431.898	538.929
	19:25	324.622	427.720	533.695
	19:30	321.525	423.615	528.552
	19:35	318.467	419.562	523.475
	19:40	315.442	415.553	518.453
	19:45	312.449	411.587	513.485
	19:50	309.489	407.664	508.571
	19:55	306.560	403.782	503.709
	20:00	303.661	399.939	498.895
	20:05	300.790	396.135	494.130
	20:10	297.948	392.368	489.411
	20:15	295.133	388.637	484.739
	20:20	292.348	384.947	480.117
	20:25	289.601	381.307	475.557
	20:30	286.888	377.711	471.053
	20:35	284.201	374.151	466.593
	20:40	281.540	370.623	462.175
	20:45	278.901	367.127	457.795
	20:50	276.286	363.661	453.454
	20:55	273.692	360.224	449.150
	21:00	271.120	356.816	444.881
	21:05	268.569	353.437	440.649
	21:10	266.039	350.085	436.452
	21:15	263.529	346.760	432.288
	21:20	261.038	343.462	428.159
	21:25	258.568	340.189	424.063
	21:30	256.117	336.945	420.001
	21:35	253.694	333.736	415.985
	21:40	251.304	330.574	412.026
	21:45	248.946	327.453	408.121
	21:50	246.612	324.364	404.255
	21:55	244.298	321.302	400.423
	22:00	242.005	318.267	396.625
	22:05	239.730	315.257	392.859
	22:10	237.473	312.270	389.122
	22:15	235.233	309.307	385.415
	22:20	233.010	306.366	381.735
	22:25	230.804	303.448	378.085
	22:30	228.620	300.561	374.473
	22:35	226.458	297.701	370.897
	22:40	224.310	294.861	367.344
	22:45	222.174	292.037	363.812
	22:50	220.050	289.228	360.299
	22:55	217.937	286.435	356.806
	23:00	215.835	283.657	353.333
	23:05	213.745	280.894	349.878
	23:10	211.666	278.147	346.444
	23:15	209.599	275.416	343.030
	23:20	207.545	272.702	339.637
	23:25	205.502	270.003	336.265
	23:30	203.471	267.321	332.913
	23:35	201.452	264.656	329.582
	23:40	199.446	262.008	326.274
	23:45	197.454	259.378	322.990
	23:50	195.481	256.774	319.737
	23:55	193.533	254.203	316.526

Babbon Kogi Hydrographs

	Time	100-Year	1000-Year	10000-Year
Day 3	0:00	191.808	251.864	313.355
	0:05	189.700	249.147	310.212
	0:10	187.807	246.650	307.095
	0:15	185.928	244.173	304.001
	0:20	184.063	241.714	300.932
	0:25	182.213	239.274	297.885
	0:30	180.376	236.852	294.863
	0:35	178.557	234.454	291.870
	0:40	176.755	232.079	288.904
	0:45	174.966	229.720	285.961
	0:50	173.188	227.377	283.036
	0:55	171.421	225.048	280.130
	1:00	169.663	222.732	277.240
	1:05	167.916	220.429	274.366
	1:10	166.177	218.139	271.507
	1:15	164.447	215.860	268.664
	1:20	162.727	213.594	265.838
	1:25	161.018	211.342	263.029
	1:30	159.319	209.105	260.238
	1:35	157.630	206.881	257.466
	1:40	155.952	204.672	254.710
	1:45	154.287	202.480	251.976
	1:50	152.633	200.303	249.263
	1:55	150.992	198.144	246.571
	2:00	149.364	196.002	243.901
	2:05	147.753	193.883	241.259
	2:10	146.164	191.793	238.656
	2:15	144.597	189.733	236.088
	2:20	143.047	187.694	233.548
	2:25	141.510	185.673	231.030
	2:30	139.987	183.671	228.535
	2:35	138.479	181.688	226.065
	2:40	136.988	179.729	223.625
	2:45	135.515	177.792	221.212
	2:50	134.055	175.874	218.826
	2:55	132.606	173.971	216.451
	3:00	131.172	172.084	214.100
	3:05	129.747	170.211	211.767
	3:10	128.332	168.351	209.450
	3:15	126.927	166.504	207.149
	3:20	125.530	164.669	204.863
	3:25	124.143	162.846	202.592
	3:30	122.765	161.035	200.337
	3:35	121.397	159.237	198.097
	3:40	120.037	157.451	195.872
	3:45	118.687	155.677	193.663
	3:50	117.347	153.916	191.470
	3:55	116.016	152.168	189.294
	4:00	114.696	150.434	187.136
	4:05	113.386	148.714	184.993
	4:10	112.087	147.008	182.869
	4:15	110.799	145.316	180.763
	4:20	109.524	143.643	178.680
	4:25	108.265	141.991	176.624
	4:30	107.023	140.360	174.596
	4:35	105.794	138.747	172.588
	4:40	104.577	137.150	170.600
	4:45	103.374	135.572	168.636
	4:50	102.188	134.012	166.695
	4:55	101.010	132.469	164.776
	5:00	99.845	130.941	162.873
	5:05	98.692	129.427	160.989
	5:10	97.548	127.927	159.123
	5:15	96.415	126.440	157.272
	5:20	95.291	124.965	155.436
	5:25	94.176	123.502	153.616
	5:30	93.070	122.050	151.809
	5:35	91.972	120.610	150.016
	5:40	90.883	119.180	148.238
	5:45	89.802	117.762	146.472
	5:50	88.729	116.354	144.721
	5:55	87.666	114.959	142.985
	6:00	86.611	113.575	141.263
	6:05	85.566	112.204	139.557
	6:10	84.530	110.845	137.867
	6:15	83.504	109.500	136.193
	6:20	82.488	108.167	134.536
	6:25	81.482	106.849	132.896
	6:30	80.487	105.544	131.273
	6:35	79.504	104.255	129.670
	6:40	78.536	102.985	128.091
	6:45	77.582	101.736	126.537
	6:50	76.644	100.506	125.007
	6:55	75.718	99.293	123.499
	7:00	74.805	98.095	122.010
	7:05	73.902	96.912	120.539
	7:10	73.010	95.743	119.085
	7:15	72.129	94.587	117.648
	7:20	71.257	93.444	116.227
	7:25	70.394	92.313	114.820
	7:30	69.540	91.194	113.428
	7:35	68.695	90.086	112.050
	7:40	67.859	88.989	110.686
	7:45	67.030	87.903	109.335
	7:50	66.209	86.827	107.996
	7:55	65.396	85.761	106.670
	8:00	64.591	84.704	105.357
	8:05	63.793	83.658	104.055
	8:10	63.003	82.623	102.767
	8:15	62.221	81.598	101.493
	8:20	61.448	80.584	100.232
	8:25	60.683	79.581	98.985
	8:30	59.927	78.590	97.753
	8:35	59.180	77.611	96.535
	8:40	58.442	76.644	95.333
	8:45	57.714	75.689	94.146
	8:50	56.996	74.748	92.976
	8:55	56.292	73.826	91.829
	9:00	55.602	72.921	90.704
	9:05	54.921	72.030	89.595
	9:10	54.250	71.150	88.502
	9:15	53.588	70.282	87.423
	9:20	52.935	69.426	86.358
	9:25	52.290	68.581	85.308
	9:30	51.654	67.748	84.271
	9:35	51.026	66.924	83.247
	9:40	50.406	66.111	82.235
	9:45	49.793	65.308	81.236
	9:50	49.188	64.514	80.249
	9:55	48.590	63.730	79.273
	10:00	47.998	62.954	78.308
	10:05	47.413	62.186	77.353
	10:10	46.835	61.427	76.409
	10:15	46.263	60.677	76.476
	10:20	45.697	59.938	74.553
	10:25	45.139	59.202	73.641
	10:30	44.586	58.478	72.739
	10:35	44.039	57.761	71.847
	10:40	43.500	57.053	70.966
	10:45	42.967	56.354	70.096
	10:50	42.440	55.663	69.237
	10:55	41.921	54.982	68.389
	11:00	41.408	54.309	67.553
	11:05	40.903	53.647	66.729
	11:10	40.408	52.997	65.921
	11:15	39.922	52.360	65.128
	11:20	39.443	51.733	64.347
	11:25	38.972	51.114	63.578
	11:30	38.507	50.504	62.819
	11:35	38.049	49.902	62.070
	11:40	37.595	49.309	61.330
	11:45	37.147	48.721	60.600
	11:50	36.705	48.140	59.877
	11:55	36.267	47.566	59.163

Babbon Kogi Hydrographs

	Time	100-Year	1000-Year	10000-Year
Day 3	12:00	35.835	46.998	58.456
	12:05	35.407	46.436	57.757
	12:10	34.983	45.880	57.065
	12:15	34.563	45.330	56.379
	12:20	34.148	44.784	55.700
	12:25	33.736	44.244	55.028
	12:30	33.329	43.710	54.363
	12:35	32.926	43.181	53.705
	12:40	32.527	42.657	53.053
	12:45	32.132	42.139	52.408
	12:50	31.742	41.626	51.770
	12:55	31.355	41.119	51.139
	13:00	30.973	40.617	50.515
	13:05	30.595	40.122	49.898
	13:10	30.222	39.632	49.288
	13:15	29.854	39.149	48.687
	13:20	29.490	38.672	48.093
	13:25	29.130	38.204	47.511
	13:30	28.784	37.745	46.940
	13:35	28.440	37.294	46.379
	13:40	28.101	36.848	45.824
	13:45	27.766	36.409	45.277
	13:50	27.435	35.975	44.737
	13:55	27.109	35.547	44.204
	14:00	26.787	35.124	43.677
	14:05	26.469	34.706	43.157
	14:10	26.155	34.294	42.644
	14:15	25.845	33.887	42.137
	14:20	25.539	33.484	41.636
	14:25	25.235	33.086	41.140
	14:30	24.935	32.691	40.649
	14:35	24.638	32.301	40.162
	14:40	24.343	31.914	39.680
	14:45	24.052	31.531	39.203
	14:50	23.763	31.151	38.730
	14:55	23.477	30.775	38.261
	15:00	23.193	30.402	37.796
	15:05	22.912	30.032	37.335
	15:10	22.633	29.665	36.878
	15:15	22.356	29.301	36.424
	15:20	22.082	28.940	35.975
	15:25	21.810	28.583	35.528
	15:30	21.540	28.228	35.086
	15:35	21.272	27.875	34.647
	15:40	21.007	27.526	34.211
	15:45	20.744	27.180	33.780
	15:50	20.483	26.836	33.351
	15:55	20.224	26.495	32.926
	16:00	19.967	26.157	32.505
	16:05	19.713	25.822	32.087
	16:10	19.460	25.490	31.672
	16:15	19.210	25.160	31.261
	16:20	18.961	24.833	30.852
	16:25	18.715	24.508	30.447
	16:30	18.470	24.186	30.045
	16:35	18.227	23.866	29.646
	16:40	17.986	23.548	29.250
	16:45	17.746	23.233	28.857
	16:50	17.509	22.920	28.467
	16:55	17.273	22.610	28.080
	17:00	17.039	22.302	27.695
	17:05	16.807	21.996	27.314
	17:10	16.576	21.692	26.935
	17:15	16.347	21.391	26.560
	17:20	16.120	21.092	26.186
	17:25	15.895	20.795	25.816
	17:30	15.671	20.500	25.448
	17:35	15.448	20.207	25.083
	17:40	15.227	19.916	24.721
	17:45	15.008	19.628	24.361
	17:50	14.791	19.342	24.004
	17:55	14.575	19.058	23.650
	18:00	14.361	18.776	23.299
	18:05	14.149	18.497	22.951
	18:10	13.938	18.220	22.606
	18:15	13.730	17.945	22.263
	18:20	13.523	17.673	21.924
	18:25	13.318	17.403	21.588
	18:30	13.115	17.136	21.256
	18:35	12.913	16.872	20.927
	18:40	12.715	16.611	20.601
	18:45	12.519	16.353	20.279
	18:50	12.324	16.097	19.962
	18:55	12.133	15.845	19.648
	19:00	11.944	15.597	19.339
	19:05	11.758	15.354	19.036
	19:10	11.576	15.114	18.738
	19:15	11.397	14.879	18.445
	19:20	11.224	14.651	18.162
	19:25	11.055	14.430	17.886
	19:30	10.890	14.213	17.616
	19:35	10.727	14.000	17.351
	19:40	10.567	13.790	17.089
	19:45	10.410	13.583	16.831
	19:50	10.256	13.379	16.577
	19:55	10.101	13.177	16.327
	20:00	9.949	12.978	16.079
	20:05	9.800	12.782	15.835
	20:10	9.652	12.588	15.593
	20:15	9.506	12.396	15.355
	20:20	9.362	12.207	15.118
	20:25	9.219	12.019	14.885
	20:30	9.078	11.833	14.653
	20:35	8.938	11.649	14.424
	20:40	8.799	11.467	14.197
	20:45	8.662	11.287	13.972
	20:50	8.526	11.108	13.749
	20:55	8.391	10.930	13.529
	21:00	8.258	10.755	13.310
	21:05	8.126	10.581	13.093
	21:10	7.995	10.409	12.878
	21:15	7.865	10.238	12.665
	21:20	7.736	10.069	12.455
	21:25	7.609	9.901	12.246
	21:30	7.482	9.735	12.039
	21:35	7.357	9.570	11.833
	21:40	7.233	9.407	11.630
	21:45	7.111	9.246	11.429
	21:50	6.989	9.085	11.229
	21:55	6.868	8.927	11.031
	22:00	6.749	8.770	10.836
	22:05	6.630	8.614	10.642
	22:10	6.513	8.460	10.450
	22:15	6.397	8.307	10.259
	22:20	6.282	8.155	10.071
	22:25	6.167	8.005	9.884
	22:30	6.054	7.856	9.698
	22:35	5.942	7.708	9.514
	22:40	5.830	7.562	9.332
	22:45	5.719	7.416	9.151
	22:50	5.609	7.272	8.971
	22:55	5.501	7.129	8.794
	23:00	5.393	6.988	8.617
	23:05	5.286	6.847	8.443
	23:10	5.179	6.708	8.270
	23:15	5.074	6.570	8.098
	23:20	4.970	6.434	7.929
	23:25	4.867	6.299	7.761
	23:30	4.765	6.165	7.595
	23:35	4.664	6.033	7.431
	23:40	4.564	5.902	7.268
	23:45	4.466	5.773	7.108
	23:50	4.369	5.646	6.951
	23:55	4.273	5.521	6.796

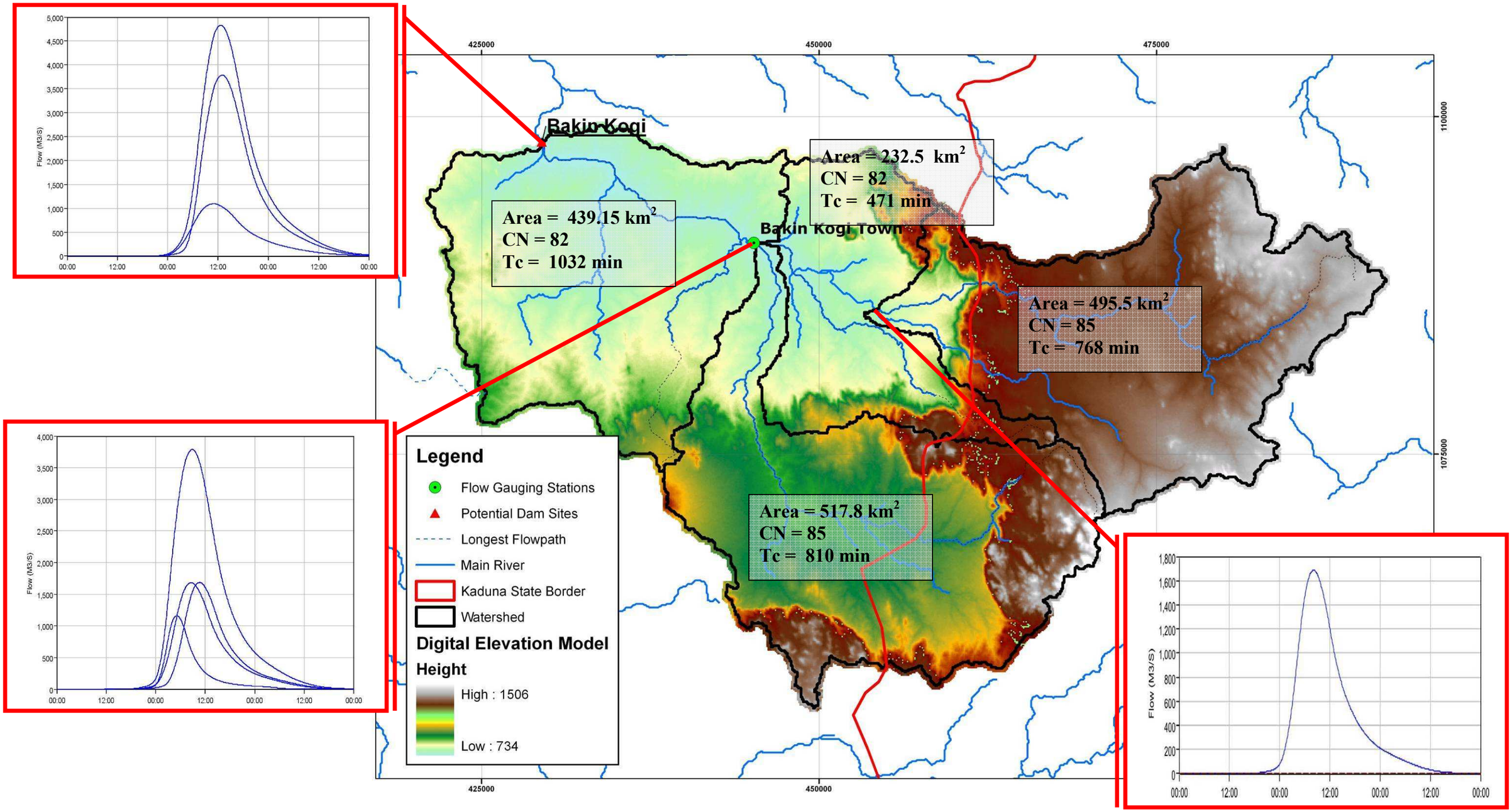
Babbon Kogi Hydrographs

	Time	100-Year	1000-Year	10000-Year
Day 4	0:00	4.179	5.398	6.643
	0:05	4.086	5.277	6.493
	0:10	3.995	5.158	6.346
	0:15	3.905	5.041	6.202
	0:20	3.816	4.928	6.061
	0:25	3.733	4.817	5.924
	0:30	3.650	4.709	5.791
	0:35	3.570	4.605	5.663
	0:40	3.495	4.508	5.542
	0:45	3.425	4.417	5.430
	0:50	3.358	4.331	5.324
	0:55	3.294	4.248	5.222
	1:00	3.233	4.168	5.124
	1:05	3.173	4.092	5.030
	1:10	3.116	4.018	4.939
	1:15	3.061	3.946	4.850
	1:20	3.007	3.877	4.765
	1:25	2.955	3.810	4.682
	1:30	2.905	3.744	4.602
	1:35	2.856	3.681	4.524
	1:40	2.808	3.620	4.449
	1:45	2.762	3.560	4.375
	1:50	2.716	3.501	4.303
	1:55	2.672	3.444	4.233
	2:00	2.629	3.389	4.165
	2:05	2.587	3.334	4.098
	2:10	2.546	3.281	4.032
	2:15	2.505	3.229	3.968
	2:20	2.466	3.178	3.905
	2:25	2.427	3.128	3.844
	2:30	2.389	3.079	3.784
	2:35	2.352	3.031	3.725
	2:40	2.316	2.984	3.667
	2:45	2.280	2.938	3.611
	2:50	2.245	2.893	3.556
	2:55	2.211	2.849	3.502
	3:00	2.178	2.806	3.449
	3:05	2.145	2.764	3.397
	3:10	2.113	2.723	3.346
	3:15	2.082	2.683	3.297
	3:20	2.051	2.643	3.248
	3:25	2.021	2.604	3.200
	3:30	1.992	2.567	3.154
	3:35	1.963	2.530	3.108
	3:40	1.935	2.493	3.064
	3:45	1.907	2.458	3.020
	3:50	1.880	2.422	2.977
	3:55	1.853	2.388	2.934
	4:00	1.826	2.353	2.892
	4:05	1.800	2.320	2.851
	4:10	1.774	2.286	2.810
	4:15	1.749	2.254	2.769
	4:20	1.724	2.221	2.730
	4:25	1.699	2.190	2.691
	4:30	1.675	2.158	2.652
	4:35	1.651	2.127	2.614
	4:40	1.627	2.097	2.576
	4:45	1.604	2.066	2.539
	4:50	1.581	2.037	2.503
	4:55	1.558	2.007	2.466
	5:00	1.535	1.978	2.431
	5:05	1.513	1.949	2.395
	5:10	1.491	1.921	2.361
	5:15	1.469	1.893	2.326
	5:20	1.448	1.865	2.292
	5:25	1.427	1.838	2.259
	5:30	1.406	1.811	2.226
	5:35	1.385	1.785	2.193
	5:40	1.365	1.758	2.161
	5:45	1.345	1.733	2.129
	5:50	1.325	1.707	2.098
	5:55	1.305	1.682	2.067
	6:00	1.286	1.657	2.036
	6:05	1.267	1.632	2.006
	6:10	1.248	1.608	1.976
	6:15	1.230	1.584	1.947
	6:20	1.211	1.561	1.918
	6:25	1.193	1.538	1.890
	6:30	1.176	1.515	1.861
	6:35	1.159	1.492	1.834
	6:40	1.141	1.470	1.806
	6:45	1.124	1.448	1.780
	6:50	1.107	1.427	1.753
	6:55	1.091	1.405	1.727
	7:00	1.074	1.384	1.701
	7:05	1.058	1.363	1.675
	7:10	1.042	1.343	1.650
	7:15	1.026	1.322	1.625
	7:20	1.011	1.302	1.600
	7:25	0.996	1.283	1.576
	7:30	0.980	1.263	1.552
	7:35	0.966	1.244	1.529
	7:40	0.951	1.225	1.505
	7:45	0.936	1.206	1.482
	7:50	0.922	1.188	1.460
	7:55	0.908	1.170	1.437
	8:00	0.894	1.152	1.415
	8:05	0.880	1.134	1.393
	8:10	0.867	1.116	1.372
	8:15	0.853	1.099	1.351
	8:20	0.840	1.082	1.330
	8:25	0.827	1.066	1.309
	8:30	0.814	1.049	1.289
	8:35	0.802	1.033	1.269
	8:40	0.789	1.017	1.249
	8:45	0.777	1.001	1.230
	8:50	0.765	0.985	1.211
	8:55	0.753	0.970	1.192
	9:00	0.741	0.955	1.173
	9:05	0.730	0.940	1.155
	9:10	0.718	0.925	1.137
	9:15	0.707	0.911	1.119
	9:20	0.696	0.896	1.101
	9:25	0.685	0.882	1.084
	9:30	0.674	0.868	1.067
	9:35	0.663	0.854	1.050
	9:40	0.653	0.841	1.033
	9:45	0.642	0.827	1.016
	9:50	0.632	0.814	1.000
	9:55	0.622	0.801	0.984
	10:00	0.611	0.788	0.968
	10:05	0.602	0.775	0.952
	10:10	0.592	0.762	0.937
	10:15	0.582	0.750	0.921
	10:20	0.573	0.738	0.906
	10:25	0.563	0.726	0.891
	10:30	0.554	0.714	0.877
	10:35	0.545	0.702	0.862
	10:40	0.536	0.690	0.848
	10:45	0.527	0.679	0.834
	10:50	0.518	0.668	0.820
	10:55	0.510	0.657	0.807
	11:00	0.501	0.646	0.793
	11:05	0.493	0.635	0.780
	11:10	0.485	0.624	0.767
	11:15	0.477	0.614	0.754
	11:20	0.469	0.603	0.742
	11:25	0.461	0.593	0.729
	11:30	0.453	0.583	0.717
	11:35	0.445	0.573	0.704
	11:40	0.437	0.563	0.692
	11:45	0.430	0.554	0.680
	11:50	0.422	0.544	0.669
	11:55	0.415	0.535	0.657

Babbon Kogi Hydrographs

	Time	100-Year	1000-Year	10000-Year
Day 4	12:00	0.408	0.525	0.646
	12:05	0.401	0.516	0.634
	12:10	0.394	0.507	0.623
	12:15	0.387	0.498	0.612
	12:20	0.380	0.490	0.602
	12:25	0.373	0.481	0.591
	12:30	0.367	0.472	0.580
	12:35	0.360	0.464	0.570
	12:40	0.354	0.456	0.560
	12:45	0.347	0.447	0.550
	12:50	0.341	0.439	0.540
	12:55	0.335	0.431	0.530
	13:00	0.329	0.424	0.520
	13:05	0.323	0.416	0.511
	13:10	0.317	0.408	0.501
	13:15	0.311	0.401	0.492
	13:20	0.305	0.393	0.483
	13:25	0.300	0.386	0.474
	13:30	0.294	0.379	0.465
	13:35	0.289	0.372	0.457
	13:40	0.283	0.365	0.448
	13:45	0.278	0.358	0.440
	13:50	0.272	0.351	0.431
	13:55	0.267	0.344	0.423
	14:00	0.262	0.337	0.415
	14:05	0.257	0.331	0.406
	14:10	0.252	0.324	0.398
	14:15	0.247	0.318	0.391
	14:20	0.242	0.312	0.383
	14:25	0.237	0.305	0.375
	14:30	0.232	0.299	0.367
	14:35	0.227	0.293	0.360
	14:40	0.223	0.287	0.353
	14:45	0.218	0.281	0.345
	14:50	0.214	0.275	0.338
	14:55	0.209	0.269	0.331
	15:00	0.205	0.264	0.324
	15:05	0.200	0.258	0.317
	15:10	0.196	0.252	0.310
	15:15	0.192	0.247	0.303
	15:20	0.187	0.241	0.297
	15:25	0.183	0.236	0.290
	15:30	0.179	0.231	0.284
	15:35	0.175	0.226	0.277
	15:40	0.171	0.221	0.271
	15:45	0.167	0.215	0.265
	15:50	0.163	0.211	0.259
	15:55	0.160	0.206	0.253
	16:00	0.156	0.201	0.247
	16:05	0.152	0.196	0.241
	16:10	0.149	0.191	0.235
	16:15	0.145	0.187	0.229
	16:20	0.141	0.182	0.224
	16:25	0.138	0.178	0.218
	16:30	0.135	0.173	0.213
	16:35	0.131	0.169	0.208
	16:40	0.128	0.165	0.203
	16:45	0.125	0.161	0.197
	16:50	0.122	0.157	0.192
	16:55	0.119	0.153	0.187
	17:00	0.115	0.149	0.183
	17:05	0.112	0.145	0.178
	17:10	0.109	0.141	0.173
	17:15	0.106	0.137	0.168
	17:20	0.104	0.133	0.164
	17:25	0.101	0.130	0.159
	17:30	0.098	0.126	0.155
	17:35	0.095	0.123	0.151
	17:40	0.093	0.119	0.147
	17:45	0.090	0.116	0.142
	17:50	0.087	0.113	0.138
	17:55	0.085	0.109	0.134
	18:00	0.083	0.106	0.131
	18:05	0.080	0.103	0.127
	18:10	0.078	0.100	0.123
	18:15	0.076	0.097	0.120
	18:20	0.073	0.094	0.116
	18:25	0.071	0.092	0.113
	18:30	0.069	0.089	0.109
	18:35	0.067	0.086	0.106
	18:40	0.065	0.084	0.103
	18:45	0.063	0.081	0.099
	18:50	0.061	0.078	0.096
	18:55	0.059	0.076	0.093
	19:00	0.057	0.074	0.091
	19:05	0.055	0.071	0.088
	19:10	0.054	0.069	0.085
	19:15	0.052	0.067	0.082
	19:20	0.050	0.065	0.080
	19:25	0.049	0.063	0.077
	19:30	0.047	0.061	0.074
	19:35	0.045	0.059	0.072
	19:40	0.044	0.057	0.070
	19:45	0.042	0.055	0.067
	19:50	0.041	0.053	0.065
	19:55	0.039	0.051	0.062
	20:00	0.038	0.049	0.060
	20:05	0.037	0.047	0.058
	20:10	0.035	0.045	0.056
	20:15	0.034	0.044	0.054
	20:20	0.033	0.042	0.052
	20:25	0.031	0.040	0.050
	20:30	0.030	0.039	0.048
	20:35	0.029	0.037	0.046
	20:40	0.028	0.036	0.044
	20:45	0.026	0.034	0.042
	20:50	0.025	0.033	0.040
	20:55	0.024	0.031	0.038
	21:00	0.023	0.030	0.036
	21:05	0.022	0.028	0.035
	21:10	0.021	0.027	0.033
	21:15	0.020	0.026	0.031
	21:20	0.019	0.024	0.030
	21:25	0.018	0.023	0.028
	21:30	0.017	0.022	0.027
	21:35	0.016	0.021	0.025
	21:40	0.015	0.020	0.024
	21:45	0.014	0.018	0.023
	21:50	0.013	0.017	0.021
	21:55	0.013	0.016	0.020
	22:00	0.012	0.015	0.019
	22:05	0.011	0.014	0.018
	22:10	0.010	0.013	0.016
	22:15	0.010	0.012	0.015
	22:20	0.009	0.012	0.014
	22:25	0.008	0.011	0.013
	22:30	0.008	0.010	0.012
	22:35	0.007	0.009	0.011
	22:40	0.007	0.008	0.010
	22:45	0.006	0.008	0.009
	22:50	0.005	0.007	0.009
	22:55	0.005	0.006	0.008
	23:00	0.004	0.006	0.007
	23:05	0.004	0.005	0.006
	23:10	0.004	0.005	0.006
	23:15	0.003	0.004	0.005
	23:20	0.003	0.004	0.004
	23:25	0.002	0.003	0.004
	23:30	0.002	0.003	0.003
	23:35	0.002	0.002	0.003
	23:40	0.002	0.002	0.002
	23:45	0.001	0.002	0.002
	23:50	0.001	0.001	0.002
	23:55	0.001	0.001	0.001

3- Upper Kaduna River Hydrologic Simulation



3.1 Bakin Kogi hydrographs

Bakin Kogi Hydrographs

Day	Time	100-Year	1000-Year	10000-Year
Day 1	0:00	0.000	0.000	0.000
	0:05	0.000	0.000	0.001
	0:10	0.000	0.000	0.001
	0:15	0.000	0.000	0.002
	0:20	0.000	0.000	0.002
	0:25	0.000	0.000	0.003
	0:30	0.000	0.000	0.004
	0:35	0.000	0.000	0.005
	0:40	0.000	0.000	0.007
	0:45	0.000	0.000	0.009
	0:50	0.000	0.000	0.011
	0:55	0.000	0.000	0.014
	1:00	0.000	0.000	0.017
	1:05	0.000	0.000	0.020
	1:10	0.000	0.000	0.024
	1:15	0.000	0.000	0.028
	1:20	0.000	0.000	0.033
	1:25	0.000	0.000	0.039
	1:30	0.000	0.000	0.046
	1:35	0.000	0.000	0.053
	1:40	0.000	0.000	0.061
	1:45	0.000	0.000	0.069
	1:50	0.000	0.000	0.079
	1:55	0.000	0.000	0.089
	2:00	0.000	0.000	0.101
	2:05	0.000	0.000	0.114
	2:10	0.000	0.000	0.127
	2:15	0.000	0.000	0.142
	2:20	0.000	0.000	0.159
	2:25	0.000	0.000	0.177
	2:30	0.000	0.000	0.196
	2:35	0.000	0.000	0.216
	2:40	0.000	0.000	0.239
	2:45	0.000	0.000	0.263
	2:50	0.000	0.001	0.288
	2:55	0.000	0.001	0.316
	3:00	0.000	0.001	0.346
	3:05	0.000	0.002	0.377
	3:10	0.000	0.002	0.411
	3:15	0.000	0.003	0.446
	3:20	0.000	0.004	0.484
	3:25	0.000	0.005	0.525
	3:30	0.000	0.006	0.567
	3:35	0.000	0.008	0.612
	3:40	0.000	0.010	0.660
	3:45	0.000	0.012	0.709
	3:50	0.000	0.015	0.762
	3:55	0.000	0.018	0.817
	4:00	0.000	0.021	0.875
	4:05	0.000	0.025	0.935
	4:10	0.000	0.029	0.998
	4:15	0.000	0.034	1.064
	4:20	0.000	0.039	1.133
	4:25	0.000	0.045	1.204
	4:30	0.000	0.051	1.279
	4:35	0.000	0.058	1.356
	4:40	0.000	0.066	1.435
	4:45	0.000	0.075	1.518
	4:50	0.000	0.084	1.603
	4:55	0.000	0.094	1.692
	5:00	0.000	0.106	1.783
	5:05	0.000	0.118	1.876
	5:10	0.000	0.131	1.973
	5:15	0.000	0.145	2.073
	5:20	0.000	0.161	2.175
	5:25	0.000	0.178	2.280
	5:30	0.000	0.196	2.388
	5:35	0.000	0.215	2.499
	5:40	0.000	0.236	2.612
	5:45	0.000	0.258	2.729
	5:50	0.000	0.281	2.848
	5:55	0.000	0.307	2.970
	6:00	0.000	0.333	3.095
	6:05	0.000	0.362	3.223
	6:10	0.000	0.392	3.353
	6:15	0.000	0.424	3.487
	6:20	0.000	0.458	3.622
	6:25	0.000	0.493	3.761
	6:30	0.000	0.531	3.902
	6:35	0.000	0.570	4.046
	6:40	0.001	0.612	4.193
	6:45	0.001	0.655	4.342
	6:50	0.001	0.701	4.493
	6:55	0.002	0.749	4.647
	7:00	0.002	0.798	4.804
	7:05	0.003	0.850	4.963
	7:10	0.004	0.904	5.125
	7:15	0.005	0.960	5.289
	7:20	0.006	1.019	5.455
	7:25	0.007	1.079	5.624
	7:30	0.009	1.142	5.795
	7:35	0.011	1.207	5.968
	7:40	0.013	1.274	6.144
	7:45	0.015	1.344	6.322
	7:50	0.018	1.416	6.502
	7:55	0.021	1.489	6.684
	8:00	0.024	1.566	6.869
	8:05	0.028	1.644	7.055
	8:10	0.033	1.724	7.243
	8:15	0.037	1.807	7.434
	8:20	0.043	1.892	7.626
	8:25	0.048	1.979	7.821
	8:30	0.055	2.069	8.017
	8:35	0.062	2.160	8.215
	8:40	0.069	2.254	8.415
	8:45	0.078	2.350	8.617
	8:50	0.086	2.447	8.819
	8:55	0.096	2.546	9.022
	9:00	0.106	2.647	9.226
	9:05	0.117	2.749	9.430
	9:10	0.128	2.853	9.635
	9:15	0.141	2.958	9.841
	9:20	0.154	3.065	10.047
	9:25	0.167	3.172	10.252
	9:30	0.182	3.281	10.456
	9:35	0.197	3.390	10.659
	9:40	0.212	3.499	10.861
	9:45	0.229	3.609	11.062
	9:50	0.246	3.720	11.262
	9:55	0.264	3.831	11.461
	10:00	0.282	3.943	11.657
	10:05	0.302	4.054	11.852
	10:10	0.322	4.166	12.045
	10:15	0.343	4.278	12.236
	10:20	0.364	4.389	12.425
	10:25	0.387	4.501	12.612
	10:30	0.409	4.612	12.796
	10:35	0.433	4.722	12.977
	10:40	0.457	4.831	13.154
	10:45	0.482	4.940	13.328
	10:50	0.507	5.048	13.499
	10:55	0.533	5.154	13.666
	11:00	0.560	5.260	13.830
	11:05	0.586	5.364	13.989
	11:10	0.614	5.466	14.142
	11:15	0.641	5.565	14.291
	11:20	0.669	5.663	14.435
	11:25	0.697	5.759	14.574
	11:30	0.725	5.853	14.707
	11:35	0.754	5.943	14.835
	11:40	0.782	6.032	14.956
	11:45	0.811	6.117	15.071
	11:50	0.839	6.199	15.179
	11:55	0.867	6.278	15.281
Day 1	12:00	23.274	54.214	100.447
	12:05	25.284	57.608	105.406
	12:10	27.418	61.176	110.589
	12:15	29.677	64.920	115.996
	12:20	32.059	68.837	121.626
	12:25	34.572	72.937	127.490
	12:30	37.220	77.227	133.596
	12:35	40.001	81.702	139.937
	12:40	42.920	86.368	146.521
	12:45	46.015	91.276	153.413
	12:50	49.410	96.593	160.823
	12:55	53.066	102.265	168.684
	13:00	56.886	108.168	176.840
	13:05	60.871	114.299	185.292
	13:10	65.022	120.664	194.043
	13:15	69.338	127.257	203.087
	13:20	73.809	134.068	212.412
	13:25	78.439	141.101	222.024
	13:30	83.233	148.366	231.938
	13:35	88.195	155.868	242.161
	13:40	93.322	163.604	252.687
	13:45	98.630	171.593	263.542
	13:50	104.153	179.887	274.794
	13:55	109.967	188.586	286.569
	14:00	115.979	197.568	298.717
	14:05	122.187	206.828	311.229
	14:10	128.600	216.380	324.123
	14:15	135.221	226.229	337.404
	14:20	142.055	236.379	351.079
	14:25	149.111	246.846	365.172
	14:30	156.402	257.648	379.704
	14:35	163.939	268.801	394.695
	14:40	171.728	280.311	410.155
	14:45	179.782	292.197	426.107
	14:50	188.133	304.506	442.610
	14:55	196.909	317.407	459.882
	15:00	206.081	330.868	477.884
	15:05	215.601	344.821	496.528
	15:10	225.486	359.289	515.844
	15:15	235.753	374.296	535.860
	15:20	246.424	389.870	556.614
	15:25	257.527	406.055	578.165
	15:30	269.150	422.972	600.669
	15:35	281.328	440.669	624.186
	15:40	294.103	459.200	648.783
	15:45	307.472	478.558	674.448
	15:50	321.548	498.895	701.373
	15:55	336.641	520.627	730.080
	16:00	353.590	544.870	761.972
	16:05	371.416	570.305	795.379
	16:10	390.055	596.845	830.188
	16:15	409.582	624.590	866.529
	16:20	430.078	653.648	904.533
	16:25	451.844	684.419	944.705
	16:30	475.049	717.130	987.328
	16:35	499.209	751.123	1031.568
	16:40	524.341	786.421	1077.450
	16:45	550.614	823.243	1125.246
	16:50	578.267	861.900	1175.342
	16:55	607.186	902.249	1227.561
	17:00	637.321	944.218	1281.814
	17:05	668.435	987.488	1337.691
	17:10	700.464	1031.967	1395.078
	17:15	733.421	1077.673	1453.992
	17:20	767.384	1124.708	1514.563
	17:25	802.751	1173.607	1577.465
	17:30	839.134	1223.845	1642.032
	17:35	876.547	1275.436	1708.277
	17:40	914.979	1328.362	1776.176
	17:45	954.346	1382.510	1845.584
	17:50	994.840	1438.137	1916.827
	17:55	1036.748	1495.623	1990.379
	18:00	1079.438	1554.115	2065.159
	18:05	1122.816	1613.483	2141.001
	18:10	1166.965	1673.833	2218.036
	18:15	1211.936	1735.234	2296.348
	18:20	1258.010	1798.058	2376.399
	18:25	1305.387	1862.559	2458.505
	18:30	1353.909	1928.521	2542.383
	18:35	1403.033	1995.219	2627.127
	18:40	1452.649	2062.504	2712.547
	18:45	1502.654	2130.235	2798.462
	18:50	1552.611	2197.821	2884.127
	18:55	1602.707	2265.524	2969.874
	19:00	1652.862	2333.233	3055.569
	19:05	1702.876	2400.686	3140.880
	19:10	1753.100	2468.351	3226.399
	19:15	1803.967	2536.790	3312.818
	19:20	1854.207	2604.311	3398.011
	19:25	1904.288	2671.554	3482.798
	19:30	1954.239	2738.557	3567.225
	19:35	2004.040	2805.296	3651.264
	19:40	2053.564	2871.594	3734.689
	19:45	2102.320	2936.794	3816.673
	19:50	2150.171	3000.722	3896.999
	19:55	2197.678	3064.131	3976.623
	20:00	2245.045	3127.297	4055.891
	20:05	2292.267	3190.203	4134.777
	20:10	2338.776	3252.091	4212.324
	20:15	2384.079	3312.300	4287.702
	20:20	2428.575	3371.369	4361.593
	20:25	2472.519	3429.646	4434.439
	20:30	2515.906	3487.126	4506.236
	20:35	2558.704	3543.769	4576.937
	20:40	2600.844	3599.482	4646.425
	20:45	2642.122	3653.989	4714.348
	20:50	2682.878	3707.748	4781.288
	20:55	2722.770	3760.308	4846.678
	21:00	2761.949	3811.869	4910.773
	21:05	2800.279	3862.251	4973.348
	21:10	2837.195	3910.696	5033.445
	21:15	2872.696	3957.210	5091.081
	21:20	2907.392	4002.618	5147.300
	21:25	2941.368	4047.039	5202.254
	21:30	2974.686	4090.555	5256.048
	21:35	3007.630	4133.541	5309.148
	21:40	3039.348	4174.859	5360.126
	21:45	3069.995	4214.720	5409.250
	21:50	3099.941	4253.620	5457.142
	21:55	3129.209	4291.586	5503.836
	22:00	3157.751	4328.555	5549.252
	22:05	3185.466	4364.389	5593.215
	22:10	3212.172	4398.843	5635.414
	22:15	3238.125	4432.262	5676.287
	22:20	3263.594	4465.002	5716.277
	22:25	3288.304	4496.693	5754.922
	22:30	3311.647	4526.536	5791.219
	22:35	3333.869	4554.855	5825.580
	22:40	3354.927	4581.593	5857.933
	22:45	3375.069	4607.089	5888.705
	22:50	3394.289	4631.331	5917.884
	22:55	3412.541	4654.262	5945.400
	23:00	3429.758	4675.794	5971.140
	23:05	3445.612	4695.494	5994.571
	23:10	3459.952	4713.164	6015.443
	23:15	3472.952	4729.040	6034.056
	23:20	3484.458	4742.925	6050.172
	23:25	3494.998	4755.526	6064.676
	23:30	3504.722	4767.043	6077.822
	23:35	3513.891	4777.827	6090.055
	23:40	3522.386	4787.715	6101.164
	23:45	3530.097	4796.558	6110.960
	23:50	3536.865	4804.144	6119.177
	23:55	3542.381	4810.066	6125.309
Day 2	0:00	3547.288	4815.154	6130.397
	0:05	3551.855	4819.845	6134.989
	0:10	3555.584	4823.389	6138.137
	0:15	3558.574	4825.943	6140.038
	0:20	3560.902	4827.608	6140.816
	0:25	3562.612	4828.443	6140.547
	0:30	3563.724	4828.477	6139.265
	0:35	3564.087	4827.506	6136.720
	0:40	3563.164	4824.823	6132.024
	0:45	3561.407	4821.029	6125.934
	0:50	3558.861	4816.180	6118.520
	0:55	3555.222	4809.878	6109.283
	1:00	3550.664	4802.359	6098.523
	1:05	3545.396	4793.898	6086.584
	1:10	3539.424	4784.502	6073.476
	1:15	3532.700	4774.108	6059.115
	1:20	3525.124	4762.580	6043.334
	1:25	3516.444	4749.592	6025.729
	1:30	3507.057	4735.673	6006.964
	1:35	3497.019	4720.894	5987.126
	1:40	3486.326	4705.247	5966.202
	1:45	3474.895	4688.622	5944.057
	1:50	3462.789	4671.106	5920.796
	1:55	3450.091	4652.804	5896.555
	2:00	3436.802	4633.720	5871.335
	2:05	3422.909	4613.836	5845.116
	2:10	3408.323	4593.034	5817.749
	2:15	3392.986	4571.237	5789.137
	2:20	3377.017	4548.602	5759.478
	2:25	3360.593	4525.367	5729.073
	2:30	3343.654	4501.452	5697.817
	2:35	3326.033	4476.634	5665.437
	2:40	3307.834	4451.055	5632.106
	2:45	3289.112	4424.787	5597.920
	2:50	3269.823	4397.774	5562.808
	2:55	3249.820	4369.819	5526.524
	3:00	3228.675	4340.362	5488.370
	3:05	3206.947	4310.143	5449.275
	3:10	3184.705	4279.257	5409.355
	3:15	3161.901	4247.635	5368.528
	3:20	3138.472	4215.201	5326.695
	3:25	3114.442	4181.987	5283.904
	3:30	3089.958	4148.187	5240.393
	3:35	3065.032	4113.818	5196.185
	3:40	3039.659	4078.872	5151.271
	3:45	3013.762	4043.249	5105.524
	3:50	2987.439	4007.079	5059.110
	3:55	2960.771	3970.471	5012.166
	4:00	2933.814	3933.501	4964.786
	4:05	2906.549	3896.141	4916.937
	4:10	2878.872	3858.255	4868.446
	4:15	2850.825	3819.900	4819.388
	4:20	2822.644	3781.391	4770.159
	4:25	2794.399	3742.820	4720.871
	4:30	2765.909	3703.945	4671.223
	4:35	2737.205	3664.809	4621.267
	4:40	2708.378	3625.533	4571.158
	4:45	2679.443	3586.137	4520.918
	4:50	2650.420	3546.647	4470.582
	4:55	2621.362	3507.133	4420.237
	5:00	2592.434	3467.816	4370.158
	5:05	2563.557	3428.589	4320.210
	5:10	2534.641	3389.329	4270.241
	5:15	2505.653	3349.994	4220.196
	5:20	2476.583	3310.576	4170.067
	5:25	2447.674	3271.394	4120.258
	5:30	2418.888	3232.400	4070.704
	5:35	2390.121	3193.452	4021.224
	5:40	2361.404	3154.590	3971.872
	5:45	2332.821	3115.926	3922.784
	5:50	2304.672	3077.858	3874.460
	5:55	2276.663	3039.994	3826.409
	6:00	2248.699	3002.206	3778.468
	6:05	2220.605	2964.266	3730.353
	6:10	2192.644	2926.521	3682.500
	6:15	2164.891	2889.072	3635.037
	6:20	2137.295	2851.851	3587.876
	6:25	2109.877	2814.885	3541.052
	6:30	2082.690	2778.246	3494.654
	6:35	2055.742	2741.943	3448.692
	6:40	2029.120	2706.090	3403.310
	6:45	2002.785	2670.635	3358.442
	6:50	1976.886	2635.774	3314.331
	6:55	1951.309	2601.357	3270.790
	7:00	1925.988	2567.295	3227.707
	7:05	1900.964	2533.642	3185.151
	7:10	1876.272	2500.446	3143.179
	7:15	1851.917	2467.710	3101.797
	7:20	1827.881	2435.413	3060.977
	7:25	1804.223	2403.629	3020.810
	7:30	1781.055	2372.510	2981.488
	7:35	1758.469	2342.174	2943.154
	7:40	1736.424	2312.564	2905.740
	7:45	1714.727	2283.424	2868.919
	7:50	1693.362	2254.733	2832.669
	7:55	1672.337	2226.500	2796.999
	8:00	1651.629	2198.695	2761.871
	8:05	1631.232	2171.309	2727.275
	8:10	1611.170	2144.377	2693.253
	8:15	1591.522	2118.000	2659.934
	8:20	1572.291	2092.182	2627.318
	8:25	1553.461	2066.900	2595.378
	8:30	1534.956	2042.055	2563.991
	8:35	1516.777	2017.649	2533.158
	8:40	1498.863	1993.598	2502.774
	8:45	1481.199	1969.884	2472.817
	8:50	1463.766	1946.481	2443.253
	8:55	1446.553	1923.374	2414.065
	9:00	1429.563	1900.570	2385.262
	9:05	1412.842	1878.127	2356.914
	9:10	1396.473	1856.156	2329.162
	9:15	1380.334	1834.493	2301.801
	9:20	1364.401	1813.108	2274.790
	9:25	1348.683	1792.013	2248.145
	9:30	1333.178	1771.203	2221.863
	9:35	1317.883	1750.677	2195.939
	9:40	1302.778	1730.406	2170.338
	9:45	1287.870	1710.400	2145.073
	9:50	1273.198	1690.712	2120.210
	9:55	1258.919	1671.549	2096.008
	10:00	1244.905	1652.740	2072.251
	10:05	1231.090	1634.199	2048.832
	10:10	1217.461	1615.906	2025.727
	10:15	1204.011	1597.855	2002.928
	10:20	1190.735	1580.036	1980.423
	10:25	1177.616	1562.429	1958.186
	10:30	1164.654	1545.034	1936.217
	10:35	1151.857	1527.863	1914.534
	10:40	1139.218	1510.904	1893.121
	10:45	1126.712	1494.128	1871.939
	10:50	1114.339	1477.532	1850.987
	10:55	1102.094	1461.108	1830.255
	11:00	1089.990	1444.877	1809.768
	11:05	1078.020	1428.828	1789.512
	11:10	1066.182	1412.958	1769.484
	11:15	1054.466	1397.253	1749.667
	11:20	1042.877	1381.719	1730.067
	11:25	1031.450	1366.406	1710.746
	11:30	1020.293	1351.452	1691.879
	11:35	1009.320	1336.746	1673.323
	11:40	998.468	1322.200	1654.971
	11:45	987.733	1307.818	1636.827
	11:50	977.123	1293.601	1618.891
	11:55	966.630	1279.543	1601.158
Day 2	12:00	956.248	1265.634	1583.614
	12:05	945.972	1251.869	1566.254
	12:10	935.800	1238.246	1549.075
	12:15	925.733	1224.767	1532.080
	12:20	915.773	1211.434	1515.271
	12:25	905.920	1198.246	1498.647
	12:30	896.172	1185.202	1482.206
	12:35	886.540	1172.315	1465.967
	12:40	877.065	1159.640	1449.997
	12:45	867.731	1147.157	1434.271
	12:50	858.516	1134.835	1418.748
	12:55	849.428	1122.684	1403.442
	13:00	840.542	1110.803	1388.477
	13:05	831.834	1099.161	1373.813
	13:10	823.294	1087.745	1359.432
	13:15	814.867	1076.478	1345.240
	13:20	806.547	1065.354	1331.228
	13:25	798.334	1054.374	1317.397
	13:30	790.219	1043.524	1303.731
	13:35	782.196	1032.800	1290.223
	13:40	774.260	1022.190	1276.860
	13:45	766.406	1011.693	1263.640
	13:50	758.636	1001.308	1250.563
	13:55	750.949	991.036	1237.628
	14:00	743.340	980.868	1224.826
	14:05	735.809	970.806	1212.159
	14:10	728.353	960.847	1199.623
	14:15	720.976	950.996	1187.224
	14:20	713.679	941.252	1174.961
	14:25	706.468	931.624	1162.845
	14:30	699.351	922.124	1150.892
	14:35	692.370	912.806	1139.168
	14:40	685.481	903.611	1127.601
	14:45	678.721	894.590	1116.252
	14:50	672.080	885.729	1105.106
	14:55	665.520	876.975	1094.095
	15:00	659.037	868.326	1083.215
	15:05	652.629	859.778	1072.464
	15:10	646.297	851.330	1061.839
	15:15	640.035	842.978	1051.335
	15:20	633.841	834.717	1040.948
	15:25	627.717	826.550	1030.678
	15:30	621.661	818.475	1020.526
	15:35	615.673	810.492	1010.489
	15:40	609.756	802.604	1000.574
	15:45	603.921	794.827	990.799
	15:50	598.151	787.139	981.136
	15:55	592.449	779.540	971.587
	16:00	586.813	772.033	962.154
	16:05	581.271	764.651	952.880
	16:10	575.809	757.377	943.742
	16:15	570.405	750.181	934.703
	16:20	565.067	743.075	925.777
	16:25	559.827	736.099	917.016
	16:30	554.648	729.206	908.360
	16:35	549.522	722.383	899.792
	16:40	544.450	715.634	891.317
	16:45	539.434	708.961	882.939
	16:50	534.490	702.384	874.683
	16:55	529.596	695.875	866.513
	17:00	524.746	689.426	858.419
	17:05	519.940	683.035	850.399
	17:10	515.177	676.703	842.454
	17:15	510.457	670.430	834.583
	17:20	505.779	664.214	826.785
	17:25	501.137	658.047	819.049
	17:30	496.535	651.932	811.380
	17:35	491.979	645.881	803.791
	17:40	487.503	639.938	796.338
	17:45	483.064	634.044	788.949
	17:50	478.655	628.190	781.610
	17:55	474.278	622.381	774.327
	18:00	469.943	616.628	767.116
	18:05	465.653	610.936	759.983
	18:10	461.391	605.282	752.898
	18:15	457.155	599.665	745.860
	18:20	452.947	594.083	738.868
	18:25	448.762	588.536	731.919
	18:30	444.599	583.019	725.009
	18:35	440.458	577.530	718.137
	18:40	436.334	572.068	711.299
	18:45	432.231	566.634	704.496
	18:50	428.154	561.236	697.741
	18:55	424.120	555.897	691.060
	19:00	420.110	550.589	684.421
	19:05	416.123	545.315	677.823
	19:10	412.174	540.092	671.290
	19:15	408.258	534.913	664.814
	19:20	404.363	529.763	658.375
	19:25	400.485	524.637	651.966
	19:30	396.624	519.534	645.587
	19:35	392.783	514.459	639.243
	19:40	388.972	509.424	632.952
	19:45	385.182	504.417	626.695
	19:50	381.407	499.432	620.466
	19:55	377.648	494.468	614.264
	20:00	373.902	489.524	608.088
	20:05	370.170	484.597	601.935
	20:10	366.449	479.687	595.804
	20:15	362.742	474.796	589.697
	20:20	359.050	469.926	583.618
	20:25	355.373	465.078	577.566
	20:30	351.711	460.250	571.541
	20:35	348.066	455.444	565.545
	20:40	344.438	450.664	559.580
	20:45	340.843	445.928	553.673
	20:50	337.266	441.216	547.796
	20:55	333.708	436.531	541.955
	21:00	330.178	431.884	536.161
	21:05	326.664	427.259	530.394
	21:10	323.168	422.657	524.659
	21:15	319.695	418.088	518.964
	21:20	316.250	413.555	513.315
	21:25	312.822	409.047	507.698
	21:30	309.411	404.561	502.109
	21:35	306.015	400.095	496.546
	21:40	302.635	395.652	491.010
	21:45	299.271	391.230	485.503
	21:50	295.923	386.829	480.022
	21:55	292.589	382.449	474.568
	22:00	289.270	378.088	469.139
	22:05	285.965	373.747	463.734
	22:10	282.677	369.428	458.359
	22:15	279.410	365.139	453.021
	22:20	276.165	360.879	447.720
	22:25	272.934	356.638	442.443
	22:30	269.719	352.420	437.195
	22:35	266.521	348.225	431.977
	22:40	263.341	344.054	426.789
	22:45	260.179	339.906	421.631
	22:50	257.035	335.784	416.506
	22:55	253.919	331.700	411.429
	23:00	250.829	327.650	406.394
	23:05	247.764	323.634	401.403
	23:10	244.721	319.647	396.448
	23:15	241.699	315.689	391.530
	23:20	238.702	311.763	386.652
	23:25	235.727	307.868	381.812
	23:30	232.776	304.003	377.011
	23:35	229.845	300.166	372.245
	23:40	226.936	296.358	367.514
	23:45	224.050	292.580	362.822
	23:50	221.196	288.845	358.184
	23:55	218.366	285.142	353.586

Bakin Kogi Hydrographs

	Time	100-Year	1000-Year	10000-Year
Day 3	0:00	215.558	281.468	349.023
	0:05	212.770	277.820	344.494
	0:10	210.003	274.200	339.999
	0:15	207.256	270.607	335.539
	0:20	204.529	267.041	331.112
	0:25	201.822	263.501	326.718
	0:30	199.139	259.992	322.363
	0:35	196.482	256.519	318.053
	0:40	193.848	253.075	313.779
	0:45	191.235	249.661	309.542
	0:50	188.645	246.274	305.340
	0:55	186.077	242.919	301.176
	1:00	183.533	239.595	297.052
	1:05	181.016	236.305	292.971
	1:10	178.525	233.051	288.934
	1:15	176.057	229.827	284.935
	1:20	173.617	226.640	280.981
	1:25	171.207	223.492	277.077
	1:30	168.822	220.376	273.212
	1:35	166.458	217.289	269.383
	1:40	164.118	214.232	265.591
	1:45	161.799	211.203	261.834
	1:50	159.502	208.203	258.113
	1:55	157.226	205.229	254.425
	2:00	154.970	202.282	250.769
	2:05	152.733	199.360	247.145
	2:10	150.515	196.464	243.552
	2:15	148.318	193.593	239.991
	2:20	146.140	190.749	236.464
	2:25	143.982	187.931	232.967
	2:30	141.844	185.137	229.502
	2:35	139.724	182.369	226.069
	2:40	137.625	179.627	222.668
	2:45	135.544	176.910	219.298
	2:50	133.484	174.218	215.960
	2:55	131.442	171.552	212.652
	3:00	129.422	168.913	209.380
	3:05	127.424	166.304	206.144
	3:10	125.451	163.726	202.950
	3:15	123.504	161.185	199.796
	3:20	121.578	158.670	196.677
	3:25	119.675	156.185	193.594
	3:30	117.793	153.728	190.548
	3:35	115.934	151.299	187.535
	3:40	114.095	148.899	184.558
	3:45	112.278	146.526	181.615
	3:50	110.483	144.181	178.706
	3:55	108.709	141.863	175.832
	4:00	106.956	139.573	172.991
	4:05	105.224	137.311	170.185
	4:10	103.513	135.076	167.413
	4:15	101.824	132.869	164.676
	4:20	100.156	130.691	161.973
	4:25	98.509	128.538	159.303
	4:30	96.882	126.413	156.667
	4:35	95.278	124.317	154.067
	4:40	93.696	122.251	151.503
	4:45	92.136	120.212	148.974
	4:50	90.597	118.202	146.480
	4:55	89.079	116.219	144.020
	5:00	87.582	114.263	141.593
	5:05	86.106	112.334	139.200
	5:10	84.651	110.432	136.841
	5:15	83.223	108.566	134.525
	5:20	81.817	106.730	132.247
	5:25	80.432	104.920	130.002
	5:30	79.068	103.136	127.789
	5:35	77.723	101.379	125.607
	5:40	76.398	99.646	123.458
	5:45	75.092	97.939	121.339
	5:50	73.803	96.255	119.248
	5:55	72.533	94.593	117.186
	6:00	71.278	92.953	115.151
	6:05	70.042	91.337	113.145
	6:10	68.824	89.745	111.169
	6:15	67.624	88.175	109.220
	6:20	66.440	86.626	107.300
	6:25	65.274	85.102	105.406
	6:30	64.124	83.599	103.540
	6:35	62.991	82.117	101.701
	6:40	61.874	80.659	99.888
	6:45	60.773	79.216	98.101
	6:50	59.687	77.796	96.338
	6:55	58.617	76.396	94.600
	7:00	57.561	75.015	92.888
	7:05	56.520	73.654	91.196
	7:10	55.493	72.312	89.531
	7:15	54.482	70.989	87.889
	7:20	53.485	69.685	86.271
	7:25	52.503	68.401	84.677
	7:30	51.535	67.136	83.107
	7:35	50.581	65.888	81.559
	7:40	49.639	64.656	80.030
	7:45	48.710	63.442	78.524
	7:50	47.795	62.246	77.039
	7:55	46.993	61.067	75.577
	8:00	46.004	59.906	74.136
	8:05	45.130	58.763	72.719
	8:10	44.270	57.640	71.327
	8:15	43.425	56.536	69.958
	8:20	42.594	55.451	68.614
	8:25	41.778	54.386	67.293
	8:30	40.975	53.339	65.995
	8:35	40.189	52.313	64.725
	8:40	39.426	51.319	63.493
	8:45	38.686	50.353	62.297
	8:50	37.961	49.408	61.127
	8:55	37.252	48.485	59.984
	9:00	36.562	47.585	58.870
	9:05	35.897	46.720	57.799
	9:10	35.252	45.880	56.760
	9:15	34.622	45.059	55.744
	9:20	34.006	44.257	54.751
	9:25	33.404	43.473	53.781
	9:30	32.816	42.708	52.834
	9:35	32.241	41.959	51.907
	9:40	31.678	41.226	51.000
	9:45	31.126	40.507	50.111
	9:50	30.586	39.804	49.240
	9:55	30.056	39.113	48.385
	10:00	29.536	38.436	47.546
	10:05	29.025	37.771	46.723
	10:10	28.523	37.116	45.913
	10:15	28.029	36.474	45.117
	10:20	27.544	35.842	44.335
	10:25	27.069	35.223	43.568
	10:30	26.602	34.615	42.816
	10:35	26.144	34.018	42.076
	10:40	25.694	33.431	41.350
	10:45	25.252	32.855	40.636
	10:50	24.817	32.289	39.935
	10:55	24.390	31.732	39.246
	11:00	23.971	31.186	38.569
	11:05	23.559	30.649	37.904
	11:10	23.155	30.122	37.250
	11:15	22.758	29.604	36.609
	11:20	22.368	29.095	35.979
	11:25	21.985	28.595	35.359
	11:30	21.608	28.104	34.751
	11:35	21.238	27.621	34.152
	11:40	20.874	27.145	33.562
	11:45	20.515	26.677	32.981
	11:50	20.161	26.215	32.409
	11:55	19.813	25.761	31.845

Bakin Kogi Hydrographs

	Time	100-Year	1000-Year	10000-Year
Day 3	12:00	19.470	25.313	31.290
	12:05	19.132	24.872	30.743
	12:10	18.799	24.437	30.204
	12:15	18.471	24.008	29.672
	12:20	18.147	23.585	29.147
	12:25	17.828	23.168	28.630
	12:30	17.514	22.758	28.121
	12:35	17.204	22.353	27.618
	12:40	16.899	21.954	27.123
	12:45	16.598	21.561	26.636
	12:50	16.301	21.173	26.155
	12:55	16.009	20.792	25.681
	13:00	15.721	20.415	25.214
	13:05	15.437	20.044	24.753
	13:10	15.156	19.677	24.298
	13:15	14.879	19.314	23.849
	13:20	14.605	18.957	23.405
	13:25	14.335	18.604	22.967
	13:30	14.068	18.255	22.534
	13:35	13.805	17.911	22.107
	13:40	13.545	17.571	21.686
	13:45	13.288	17.236	21.270
	13:50	13.035	16.905	20.859
	13:55	12.786	16.578	20.455
	14:00	12.539	16.257	20.055
	14:05	12.296	15.939	19.662
	14:10	12.056	15.626	19.274
	14:15	11.820	15.318	18.891
	14:20	11.588	15.014	18.515
	14:25	11.358	14.715	18.144
	14:30	11.133	14.420	17.778
	14:35	10.910	14.129	17.418
	14:40	10.691	13.844	17.064
	14:45	10.475	13.562	16.716
	14:50	10.263	13.285	16.373
	14:55	10.054	13.013	16.035
	15:00	9.849	12.745	15.703
	15:05	9.647	12.482	15.378
	15:10	9.449	12.224	15.058
	15:15	9.254	11.971	14.746
	15:20	9.064	11.724	14.440
	15:25	8.878	11.482	14.141
	15:30	8.697	11.246	13.850
	15:35	8.523	11.020	13.571
	15:40	8.358	10.806	13.306
	15:45	8.197	10.597	13.049
	15:50	8.040	10.395	12.799
	15:55	7.888	10.197	12.556
	16:00	7.740	10.006	12.320
	16:05	7.596	9.819	12.091
	16:10	7.455	9.637	11.866
	16:15	7.318	9.460	11.647
	16:20	7.184	9.286	11.434
	16:25	7.053	9.117	11.225
	16:30	6.925	8.952	11.021
	16:35	6.800	8.790	10.822
	16:40	6.677	8.631	10.627
	16:45	6.557	8.476	10.435
	16:50	6.440	8.323	10.248
	16:55	6.324	8.174	10.064
	17:00	6.211	8.028	9.883
	17:05	6.100	7.884	9.707
	17:10	5.991	7.743	9.533
	17:15	5.884	7.605	9.364
	17:20	5.780	7.470	9.197
	17:25	5.677	7.338	9.034
	17:30	5.577	7.208	8.875
	17:35	5.479	7.081	8.718
	17:40	5.383	6.957	8.565
	17:45	5.288	6.835	8.415
	17:50	5.195	6.715	8.267
	17:55	5.105	6.597	8.123
	18:00	5.016	6.482	7.981
	18:05	4.928	6.369	7.842
	18:10	4.842	6.259	7.705
	18:15	4.758	6.150	7.572
	18:20	4.676	6.043	7.440
	18:25	4.595	5.939	7.312
	18:30	4.516	5.837	7.186
	18:35	4.438	5.736	7.062
	18:40	4.362	5.638	6.941
	18:45	4.287	5.541	6.822
	18:50	4.213	5.446	6.705
	18:55	4.141	5.352	6.589
	19:00	4.070	5.260	6.476
	19:05	4.000	5.169	6.365
	19:10	3.931	5.080	6.256
	19:15	3.863	4.993	6.147
	19:20	3.796	4.907	6.041
	19:25	3.731	4.822	5.937
	19:30	3.666	4.738	5.834
	19:35	3.602	4.656	5.733
	19:40	3.540	4.576	5.634
	19:45	3.478	4.496	5.536
	19:50	3.418	4.418	5.439
	19:55	3.358	4.341	5.344
	20:00	3.300	4.265	5.251
	20:05	3.242	4.190	5.159
	20:10	3.185	4.117	5.069
	20:15	3.129	4.045	4.980
	20:20	3.074	3.974	4.893
	20:25	3.020	3.904	4.807
	20:30	2.967	3.836	4.723
	20:35	2.915	3.768	4.640
	20:40	2.864	3.702	4.559
	20:45	2.814	3.637	4.479
	20:50	2.764	3.573	4.400
	20:55	2.716	3.510	4.322
	21:00	2.668	3.448	4.246
	21:05	2.621	3.387	4.171
	21:10	2.574	3.327	4.097
	21:15	2.528	3.268	4.024
	21:20	2.483	3.210	3.953
	21:25	2.439	3.153	3.882
	21:30	2.395	3.096	3.813
	21:35	2.352	3.041	3.744
	21:40	2.310	2.986	3.677
	21:45	2.269	2.933	3.611
	21:50	2.228	2.880	3.546
	21:55	2.187	2.828	3.482
	22:00	2.148	2.777	3.419
	22:05	2.109	2.726	3.357
	22:10	2.071	2.677	3.297
	22:15	2.033	2.629	3.237
	22:20	1.996	2.581	3.178
	22:25	1.960	2.534	3.120
	22:30	1.924	2.488	3.064
	22:35	1.889	2.443	3.008
	22:40	1.855	2.398	2.953
	22:45	1.821	2.354	2.899
	22:50	1.788	2.311	2.846
	22:55	1.755	2.269	2.794
	23:00	1.723	2.227	2.743
	23:05	1.691	2.186	2.692
	23:10	1.660	2.146	2.643
	23:15	1.629	2.106	2.594
	23:20	1.599	2.067	2.546
	23:25	1.569	2.029	2.499
	23:30	1.540	1.991	2.452
	23:35	1.511	1.954	2.406
	23:40	1.483	1.918	2.361
	23:45	1.455	1.882	2.317
	23:50	1.428	1.846	2.274
	23:55	1.401	1.812	2.231

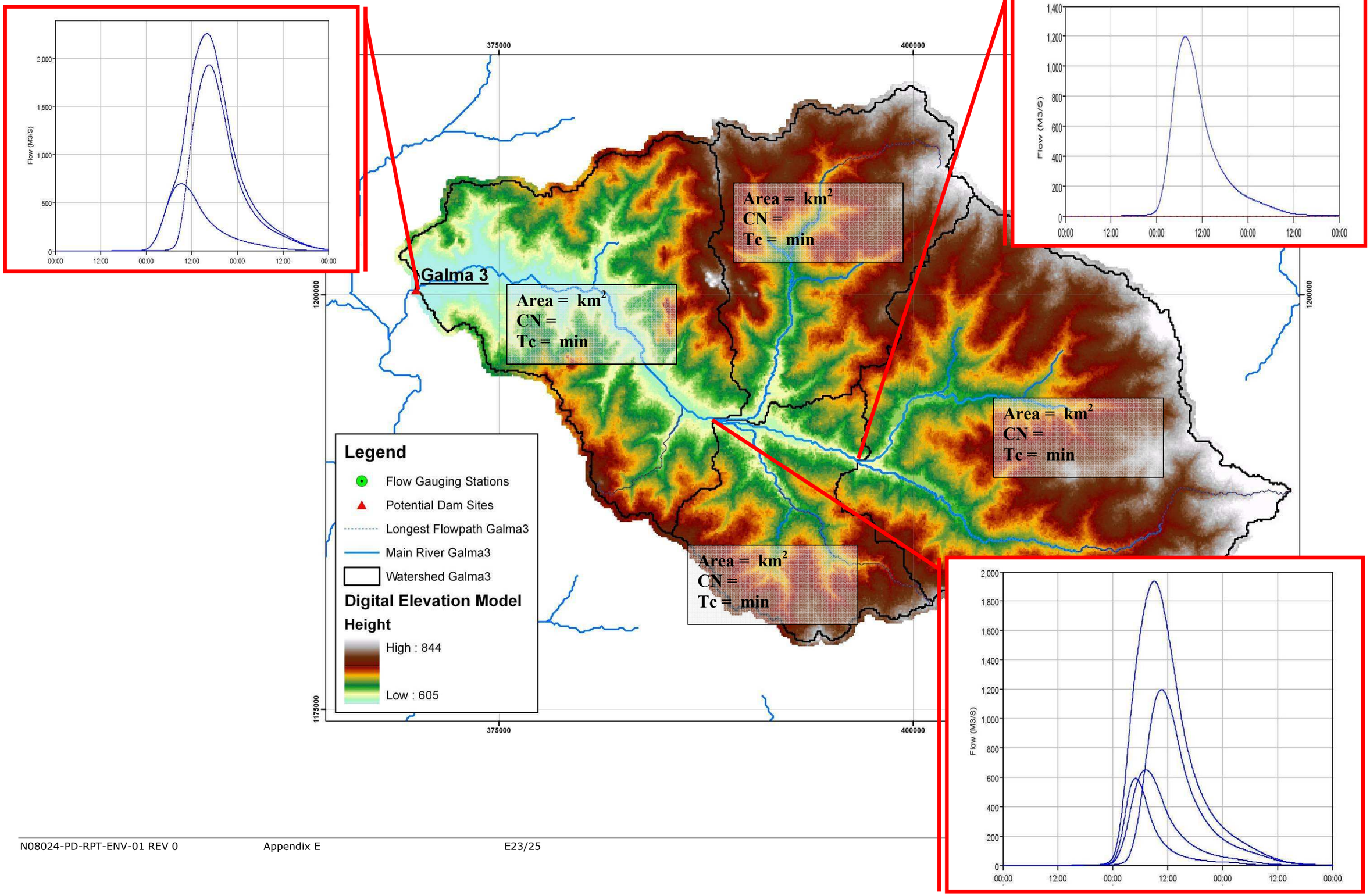
Bakin Kogi Hydrographs

	Time	100-Year	1000-Year	10000-Year
Day 4	0:00	1.375	1.777	2.189
	0:05	1.349	1.744	2.147
	0:10	1.323	1.711	2.107
	0:15	1.298	1.678	2.066
	0:20	1.273	1.646	2.027
	0:25	1.249	1.614	1.988
	0:30	1.225	1.583	1.950
	0:35	1.201	1.553	1.912
	0:40	1.178	1.523	1.875
	0:45	1.155	1.493	1.839
	0:50	1.132	1.464	1.803
	0:55	1.110	1.435	1.768
	1:00	1.088	1.407	1.733
	1:05	1.067	1.380	1.699
	1:10	1.046	1.352	1.665
	1:15	1.026	1.325	1.632
	1:20	1.004	1.299	1.600
	1:25	0.984	1.273	1.568
	1:30	0.964	1.247	1.536
	1:35	0.945	1.222	1.505
	1:40	0.925	1.197	1.474
	1:45	0.906	1.172	1.444
	1:50	0.888	1.148	1.414
	1:55	0.869	1.124	1.384
	2:00	0.851	1.100	1.355
	2:05	0.833	1.077	1.327
	2:10	0.815	1.054	1.299
	2:15	0.798	1.032	1.271
	2:20	0.781	1.010	1.244
	2:25	0.764	0.988	1.217
	2:30	0.747	0.966	1.190
	2:35	0.731	0.945	1.164
	2:40	0.715	0.925	1.139
	2:45	0.699	0.904	1.114
	2:50	0.683	0.884	1.089
	2:55	0.668	0.864	1.065
	3:00	0.653	0.845	1.041
	3:05	0.638	0.826	1.017
	3:10	0.624	0.807	0.994
	3:15	0.610	0.789	0.972
	3:20	0.596	0.771	0.949
	3:25	0.582	0.753	0.927
	3:30	0.568	0.735	0.906
	3:35	0.555	0.718	0.885
	3:40	0.542	0.701	0.864
	3:45	0.529	0.684	0.843
	3:50	0.516	0.668	0.823
	3:55	0.504	0.652	0.803
	4:00	0.492	0.636	0.784
	4:05	0.480	0.621	0.765
	4:10	0.468	0.605	0.746
	4:15	0.456	0.590	0.727
	4:20	0.445	0.576	0.709
	4:25	0.434	0.561	0.692
	4:30	0.423	0.547	0.674
	4:35	0.412	0.533	0.657
	4:40	0.402	0.520	0.640
	4:45	0.391	0.506	0.624
	4:50	0.381	0.493	0.608
	4:55	0.371	0.481	0.592
	5:00	0.362	0.468	0.577
	5:05	0.352	0.456	0.562
	5:10	0.343	0.444	0.547
	5:15	0.334	0.432	0.532
	5:20	0.325	0.420	0.518
	5:25	0.316	0.409	0.504
	5:30	0.307	0.398	0.490
	5:35	0.299	0.387	0.477
	5:40	0.290	0.376	0.464
	5:45	0.282	0.366	0.451
	5:50	0.274	0.355	0.438
	5:55	0.267	0.345	0.426
	6:00	0.259	0.335	0.413
	6:05	0.251	0.326	0.402
	6:10	0.244	0.316	0.390
	6:15	0.237	0.307	0.378
	6:20	0.230	0.298	0.367
	6:25	0.223	0.289	0.356
	6:30	0.216	0.280	0.346
	6:35	0.210	0.272	0.335
	6:40	0.204	0.264	0.326
	6:45	0.197	0.256	0.315
	6:50	0.191	0.248	0.306
	6:55	0.185	0.240	0.296
	7:00	0.180	0.233	0.287
	7:05	0.174	0.226	0.278
	7:10	0.169	0.219	0.270
	7:15	0.163	0.212	0.261
	7:20	0.158	0.205	0.253
	7:25	0.153	0.199	0.245
	7:30	0.148	0.192	0.237
	7:35	0.144	0.186	0.230
	7:40	0.139	0.180	0.223
	7:45	0.135	0.175	0.216
	7:50	0.131	0.169	0.209
	7:55	0.126	0.164	0.202
	8:00	0.123	0.159	0.196
	8:05	0.119	0.154	0.190
	8:10	0.115	0.149	0.184
	8:15	0.112	0.145	0.179
	8:20	0.108	0.140	0.173
	8:25	0.105	0.136	0.168
	8:30	0.102	0.132	0.163
	8:35	0.099	0.129	0.159
	8:40	0.096	0.125	0.154
	8:45	0.094	0.122	0.150
	8:50	0.091	0.118	0.146
	8:55	0.089	0.115	0.142
	9:00	0.086	0.112	0.138
	9:05	0.084	0.109	0.134
	9:10	0.082	0.106	0.130
	9:15	0.079	0.103	0.127
	9:20	0.077	0.100	0.123
	9:25	0.075	0.097	0.120
	9:30	0.073	0.094	0.116
	9:35	0.071	0.091	0.113
	9:40	0.068	0.089	0.110
	9:45	0.066	0.086	0.106
	9:50	0.064	0.083	0.103
	9:55	0.062	0.081	0.100
	10:00	0.060	0.078	0.097
	10:05	0.059	0.076	0.094
	10:10	0.057	0.074	0.091
	10:15	0.055	0.071	0.088
	10:20	0.053	0.069	0.085
	10:25	0.051	0.067	0.082
	10:30	0.050	0.064	0.079
	10:35	0.048	0.062	0.077
	10:40	0.046	0.060	0.074
	10:45	0.045	0.058	0.071
	10:50	0.043	0.056	0.069
	10:55	0.041	0.054	0.066
	11:00	0.040	0.052	0.064
	11:05	0.038	0.050	0.062
	11:10	0.037	0.048	0.059
	11:15	0.036	0.046	0.057
	11:20	0.034	0.044	0.055
	11:25	0.033	0.042	0.052
	11:30	0.031	0.041	0.050
	11:35	0.030	0.039	0.048
	11:40	0.029	0.037	0.046
	11:45	0.028	0.036	0.044
	11:50	0.026	0.034	0.042
	11:55	0.025	0.033	0.040

Bakin Kogi Hydrographs

	Time	100-Year	1000-Year	10000-Year
Day 4	12:00	0.024	0.031	0.038
	12:05	0.023	0.030	0.036
	12:10	0.022	0.028	0.035
	12:15	0.021	0.027	0.033
	12:20	0.019	0.025	0.031
	12:25	0.018	0.024	0.030
	12:30	0.017	0.023	0.028
	12:35	0.017	0.021	0.026
	12:40	0.016	0.020	0.025
	12:45	0.015	0.019	0.023
	12:50	0.014	0.018	0.022
	12:55	0.013	0.017	0.021
	13:00	0.012	0.016	0.019
	13:05	0.011	0.015	0.018
	13:10	0.011	0.014	0.017
	13:15	0.010	0.013	0.016
	13:20	0.009	0.012	0.014
	13:25	0.008	0.011	0.013
	13:30	0.008	0.010	0.012
	13:35	0.007	0.009	0.011
	13:40	0.006	0.008	0.010
	13:45	0.006	0.008	0.009
	13:50	0.005	0.007	0.009
	13:55	0.005	0.006	0.008
	14:00	0.004	0.006	0.007
	14:05	0.004	0.005	0.006
	14:10	0.003	0.004	0.005
	14:15	0.003	0.004	0.005
	14:20	0.003	0.003	0.004
	14:25	0.002	0.003	0.004
	14:30	0.002	0.003	0.003
	14:35	0.002	0.002	0.003
	14:40	0.001	0.002	0.002
	14:45	0.001	0.001	0.002
	14:50	0.001	0.001	0.001
	14:55	0.001	0.001	0.001
	15:00	0.000	0.001	0.001
	15:05	0.000	0.000	0.001
	15:10	0.000	0.000	0.000

4- Likarbu River Hydrologic Simulation



4.1 Galma3 hydrographs

Bakin Kogi Hydrographs

Day	Time	100-Year	1000-Year	10000-Year
Day 1	0:00	0.000	0.000	0.000
	0:05	0.000	0.000	0.001
	0:10	0.000	0.000	0.001
	0:15	0.000	0.000	0.002
	0:20	0.000	0.000	0.002
	0:25	0.000	0.000	0.003
	0:30	0.000	0.000	0.004
	0:35	0.000	0.000	0.005
	0:40	0.000	0.000	0.007
	0:45	0.000	0.000	0.009
	0:50	0.000	0.000	0.011
	0:55	0.000	0.000	0.014
	1:00	0.000	0.000	0.017
	1:05	0.000	0.000	0.020
	1:10	0.000	0.000	0.024
	1:15	0.000	0.000	0.028
	1:20	0.000	0.000	0.033
	1:25	0.000	0.000	0.039
	1:30	0.000	0.000	0.046
	1:35	0.000	0.000	0.053
	1:40	0.000	0.000	0.061
	1:45	0.000	0.000	0.069
	1:50	0.000	0.000	0.079
	1:55	0.000	0.000	0.089
	2:00	0.000	0.000	0.101
	2:05	0.000	0.000	0.114
	2:10	0.000	0.000	0.127
	2:15	0.000	0.000	0.142
	2:20	0.000	0.000	0.159
	2:25	0.000	0.000	0.177
	2:30	0.000	0.000	0.196
	2:35	0.000	0.000	0.216
	2:40	0.000	0.000	0.239
	2:45	0.000	0.000	0.263
	2:50	0.000	0.001	0.288
	2:55	0.000	0.001	0.316
	3:00	0.000	0.001	0.346
	3:05	0.000	0.002	0.377
	3:10	0.000	0.002	0.411
	3:15	0.000	0.003	0.446
	3:20	0.000	0.004	0.484
	3:25	0.000	0.005	0.525
	3:30	0.000	0.006	0.567
	3:35	0.000	0.008	0.612
	3:40	0.000	0.010	0.660
	3:45	0.000	0.012	0.709
	3:50	0.000	0.015	0.762
	3:55	0.000	0.018	0.817
	4:00	0.000	0.021	0.875
	4:05	0.000	0.025	0.935
	4:10	0.000	0.029	0.998
	4:15	0.000	0.034	1.064
	4:20	0.000	0.039	1.133
	4:25	0.000	0.045	1.204
	4:30	0.000	0.051	1.279
	4:35	0.000	0.058	1.356
	4:40	0.000	0.066	1.435
	4:45	0.000	0.075	1.518
	4:50	0.000	0.084	1.603
	4:55	0.000	0.094	1.692
	5:00	0.000	0.106	1.783
	5:05	0.000	0.118	1.876
	5:10	0.000	0.131	1.973
	5:15	0.000	0.145	2.073
	5:20	0.000	0.161	2.175
	5:25	0.000	0.178	2.280
	5:30	0.000	0.196	2.388
	5:35	0.000	0.215	2.499
	5:40	0.000	0.236	2.612
	5:45	0.000	0.258	2.729
	5:50	0.000	0.281	2.848
	5:55	0.000	0.307	2.970
	6:00	0.000	0.333	3.095
	6:05	0.000	0.362	3.223
	6:10	0.000	0.392	3.353
	6:15	0.000	0.424	3.487
	6:20	0.000	0.458	3.622
	6:25	0.000	0.493	3.761
	6:30	0.000	0.531	3.902
	6:35	0.000	0.570	4.046
	6:40	0.001	0.612	4.193
	6:45	0.001	0.655	4.342
	6:50	0.001	0.701	4.493
	6:55	0.002	0.749	4.647
	7:00	0.002	0.798	4.804
	7:05	0.003	0.850	4.963
	7:10	0.004	0.904	5.125
	7:15	0.005	0.960	5.289
	7:20	0.006	1.019	5.455
	7:25	0.007	1.079	5.624
	7:30	0.009	1.142	5.795
	7:35	0.011	1.207	5.968
	7:40	0.013	1.274	6.144
	7:45	0.015	1.344	6.322
	7:50	0.018	1.416	6.502
	7:55	0.021	1.489	6.684
	8:00	0.024	1.566	6.869
	8:05	0.028	1.644	7.055
	8:10	0.033	1.724	7.243
	8:15	0.037	1.807	7.434
	8:20	0.043	1.892	7.626
	8:25	0.048	1.979	7.821
	8:30	0.055	2.069	8.017
	8:35	0.062	2.160	8.215
	8:40	0.069	2.254	8.415
	8:45	0.078	2.350	8.617
	8:50	0.086	2.447	8.819
	8:55	0.096	2.546	9.022
	9:00	0.106	2.647	9.226
	9:05	0.117	2.749	9.430
	9:10	0.128	2.853	9.635
	9:15	0.141	2.958	9.841
	9:20	0.154	3.065	10.047
	9:25	0.167	3.172	10.252
	9:30	0.182	3.281	10.456
	9:35	0.197	3.390	10.659
	9:40	0.212	3.499	10.861
	9:45	0.229	3.609	11.062
	9:50	0.246	3.720	11.262
	9:55	0.264	3.831	11.461
	10:00	0.282	3.943	11.657
	10:05	0.302	4.054	11.852
	10:10	0.322	4.166	12.045
	10:15	0.343	4.278	12.236
	10:20	0.364	4.389	12.425
	10:25	0.387	4.501	12.612
	10:30	0.409	4.612	12.796
	10:35	0.433	4.722	12.977
	10:40	0.457	4.831	13.154
	10:45	0.482	4.940	13.328
	10:50	0.507	5.048	13.499
	10:55	0.533	5.154	13.666
	11:00	0.560	5.260	13.830
	11:05	0.586	5.364	13.989
	11:10	0.614	5.466	14.142
	11:15	0.641	5.565	14.291
	11:20	0.669	5.663	14.435
	11:25	0.697	5.759	14.574
	11:30	0.725	5.853	14.707
	11:35	0.754	5.943	14.835
	11:40	0.782	6.032	14.956
	11:45	0.811	6.117	15.071
	11:50	0.839	6.199	15.179
	11:55	0.867	6.278	15.281

Bakin Kogi Hydrographs

Day	Time	100-Year	1000-Year	10000-Year
Day 1	12:00	50.087	78.547	113.086
	12:05	53.510	83.506	119.748
	12:10	57.118	88.720	126.743
	12:15	60.836	94.088	133.936
	12:20	64.654	99.597	141.315
	12:25	68.575	105.250	148.882
	12:30	72.602	111.052	156.644
	12:35	76.735	117.002	164.597
	12:40	80.973	123.099	172.741
	12:45	85.314	129.339	181.070
	12:50	89.771	135.741	189.608
	12:55	94.379	142.355	198.420
	13:00	99.261	149.344	207.712
	13:05	104.281	156.524	217.249
	13:10	109.419	163.867	226.995
	13:15	114.679	171.376	236.954
	13:20	120.060	179.055	247.131
	13:25	125.560	186.897	257.514
	13:30	131.174	194.894	268.096
	13:35	136.898	203.043	278.871
	13:40	142.741	211.355	289.852
	13:45	148.738	219.877	301.101
	13:50	155.007	228.771	312.821
	13:55	161.494	237.958	324.913
	14:00	168.104	247.312	337.214
	14:05	174.832	256.825	349.713
	14:10	181.677	266.494	362.408
	14:15	188.632	276.310	375.287
	14:20	195.686	286.257	388.327
	14:25	202.832	296.326	401.518
	14:30	210.068	306.512	414.853
	14:35	217.401	316.827	428.347
	14:40	224.887	327.344	442.090
	14:45	232.572	338.125	456.164
	14:50	240.337	349.007	470.359
	14:55	248.166	359.972	484.653
	15:00	256.054	371.014	499.040
	15:05	263.989	382.112	513.493
	15:10	271.953	393.244	527.983
	15:15	279.934	404.392	542.486
	15:20	287.928	415.553	557.002
	15:25	295.918	426.705	571.500
	15:30	303.865	437.792	585.911
	15:35	311.647	448.654	600.031
	15:40	319.384	459.451	614.068
	15:45	327.087	470.203	628.047
	15:50	334.753	480.905	641.961
	15:55	342.377	491.550	655.803
	16:00	349.946	502.121	669.551
	16:05	357.460	512.619	683.205
	16:10	364.921	523.046	696.769
	16:15	372.319	533.390	710.230
	16:20	379.610	543.591	723.510
	16:25	386.651	553.455	736.365
	16:30	393.493	563.055	748.887
	16:35	400.258	572.558	761.291
	16:40	406.954	581.974	773.591
	16:45	413.583	591.309	785.795
	16:50	420.140	600.555	797.895
	16:55	426.641	609.739	809.923
	17:00	433.097	618.872	821.899
	17:05	439.514	627.966	833.835
	17:10	445.868	636.987	845.688
	17:15	452.077	645.824	857.319
	17:20	458.053	654.360	868.581
	17:25	464.019	662.903	879.868
	17:30	470.014	671.505	891.246
	17:35	476.063	680.203	902.765
	17:40	482.183	689.018	914.450
	17:45	488.417	698.008	926.375
	17:50	494.900	707.360	938.777
	17:55	502.070	717.661	952.400
	18:00	509.458	728.274	966.431
	18:05	516.995	739.102	980.746
	18:10	524.507	749.908	995.044
	18:15	532.244	761.037	1009.764
	18:20	540.466	772.840	1025.354
	18:25	549.212	785.367	1041.874
	18:30	558.309	798.382	1059.022
	18:35	567.944	812.134	1077.111
	18:40	577.931	826.369	1095.815
	18:45	588.273	841.090	1115.140
	18:50	599.112	856.491	1135.333
	18:55	610.270	872.328	1156.080
	19:00	621.650	888.469	1177.213
	19:05	633.263	904.926	1198.748
	19:10	645.221	921.852	1220.877
	19:15	657.739	939.540	1243.973
	19:20	670.848	958.027	1268.079
	19:25	684.291	976.963	1292.750
	19:30	698.058	996.332	1317.965
	19:35	712.150	1016.136	1343.725
	19:40	726.626	1036.454	1370.130
	19:45	741.712	1057.591	1397.563
	19:50	757.189	1079.242	1425.636
	19:55	772.908	1101.208	1454.095
	20:00	788.992	1123.653	1483.146
	20:05	805.395	1146.517	1512.713
	20:10	822.171	1169.869	1542.884
	20:15	839.492	1193.941	1573.952
	20:20	857.080	1218.351	1605.425
	20:25	874.904	1243.056	1637.249
	20:30	892.975	1268.071	1669.445
	20:35	911.371	1293.500	1702.140
	20:40	929.859	1319.025	1734.929
	20:45	948.266	1344.412	1767.520
	20:50	966.762	1369.898	1800.213
	20:55	985.393	1395.545	1833.091
	21:00	1004.323	1421.571	1866.426
	21:05	1023.242	1447.551	1899.673
	21:10	1041.694	1472.868	1932.052
	21:15	1060.190	1498.220	1964.453
	21:20	1078.789	1523.689	1996.979
	21:25	1097.350	1549.078	2029.380
	21:30	1115.777	1574.258	2061.488
	21:35	1133.828	1598.901	2092.891
	21:40	1151.578	1623.112	2123.724
	21:45	1169.364	1647.349	2154.570
	21:50	1186.997	1671.355	2185.099
	21:55	1204.334	1694.932	2215.060
	22:00	1221.211	1717.860	2244.171
	22:05	1237.408	1739.842	2272.063
	22:10	1253.214	1761.277	2299.242
	22:15	1268.745	1782.320	2325.909
	22:20	1284.016	1802.994	2352.090
	22:25	1299.110	1823.410	2377.925
	22:30	1313.756	1843.195	2402.941
	22:35	1327.797	1862.140	2426.872
	22:40	1341.253	1880.278	2449.763
	22:45	1354.366	1897.938	2472.038
	22:50	1367.132	1915.118	2493.695
	22:55	1379.474	1931.712	2514.596
	23:00	1391.129	1947.362	2534.289
	23:05	1402.410	1962.499	2553.322
	23:10	1413.499	1977.366	2572.007
	23:15	1424.191	1991.687	2589.989
	23:20	1434.193	2005.066	2606.769
	23:25	1443.843	2017.963	2622.935
	23:30	1453.134	2030.373	2638.479
	23:35	1462.158	2042.417	2653.557
	23:40	1470.957	2054.150	2668.234
	23:45	1479.647	2065.733	2682.716
	23:50	1488.447	2077.457	2697.371
	23:55	1497.010	2088.849	2711.591

Bakin Kogi Hydrographs

Day	Time	100-Year	1000-Year	10000-Year
Day 2	0:00	1504.995	2099.443	2724.790
	0:05	1512.782	2109.765	2737.636
	0:10	1520.469	2119.944	2750.294
	0:15	1528.027	2129.936	2762.706
	0:20	1535.355	2139.604	2774.693
	0:25	1542.335	2148.786	2786.050
	0:30	1549.273	2157.896	2797.304
	0:35	1556.148	2166.907	2808.417
	0:40	1562.746	2175.525	2819.016
	0:45	1569.091	2183.783	2829.144
	0:50	1575.105	2191.577	2838.669
	0:55	1580.726	2198.825	2847.486
	1:00	1586.145	2205.784	2855.926
	1:05	1591.451	2212.575	2864.138
	1:10	1596.437	2218.912	2871.755
	1:15	1600.915	2224.543	2878.462
	1:20	1604.971	2229.588	2884.411
	1:25	1608.735	2234.223	2889.828
	1:30	1612.219	2238.468	2894.739
	1:35	1615.415	2242.308	2899.125
	1:40	1618.360	2245.796	2903.053
	1:45	1621.151	2249.063	2906.687
	1:50	1623.906	2252.263	2910.221
	1:55	1626.134	2254.726	2912.801
	2:00	1627.843	2256.469	2914.451
	2:05	1629.203	2257.724	2915.469
	2:10	1630.259	2258.555	2915.937
	2:15	1631.066	2259.035	2915.949
	2:20	1631.612	2259.148	2915.481
	2:25	1631.870	2258.855	2914.486
	2:30	1631.807	2258.113	2912.907
	2:35	1631.270	2256.711	2910.478
	2:40	1630.034	2254.348	2906.816
	2:45	1628.468	2251.531	2902.571
	2:50	1626.578	2248.267	2897.752
	2:55	1624.318	2244.492	2892.279
	3:00	1621.705	2240.233	2886.182
	3:05	1618.772	2235.532	2879.520
	3:10	1615.585	2230.479	2872.405
	3:15	1612.065	2224.966	2864.698
	3:20	1607.784	2218.412	2855.660
	3:25	1602.853	2210.970	2845.494
	3:30	1597.520	2202.985	2834.636
	3:35	1591.827	2194.513	2823.162
	3:40	1585.842	2185.645	2811.187
	3:45	1579.509	2176.305	2798.611
	3:50	1572.843	2166.513	2785.461
	3:55	1565.839	2156.261	2771.725
	4:00	1558.389	2145.402	2757.219
	4:05	1550.402	2133.817	2741.790
	4:10	1542.100	2121.808	2725.828
	4:15	1533.479	2109.369	2709.323
	4:20	1524.554	2096.520	2692.299
	4:25	1515.344	2083.291	2674.796
	4:30	1505.875	2069.713	2656.855
	4:35	1496.159	2055.805	2638.501
	4:40	1486.163	2041.522	2619.672
	4:45	1475.664	2026.560	2599.985
	4:50	1464.722	2011.005	2579.551
	4:55	1453.527	1995.115	2558.702
	5:00	1442.146	1978.985	2537.556
	5:05	1430.672	1962.736	2516.268
	5:10	1419.025	1946.262	2494.702
	5:15	1407.240	1929.610	2472.916
	5:20	1395.385	1912.872	2451.031
	5:25	1383.576	1896.206	2429.245
	5:30	1371.593	1879.309	2407.170
	5:35	1359.474	1862.235	2384.877
	5:40	1347.253	1845.029	2362.422
	5:45	1334.941	1827.706	2339.825
	5:50	1322.548	1810.277	2317.099
	5:55	1310.083	1792.758	2294.264
	6:00	1297.600	1775.222	2271.413
	6:05	1285.094	1757.660	2248.537
	6:10	1272.436	1739.901	2225.416
	6:15	1259.657	1721.983	2202.101
	6:20	1246.799	1703.965	2178.665
	6:25	1233.861	1685.847	2155.110
	6:30	1220.847	1667.632	2131.438
	6:35	1207.757	1649.321	2107.652
	6:40	1194.608	1630.938	2083.782
	6:45	1181.434	1612.530	2059.887
	6:50	1168.127	1593.948	2035.778
	6:55	1154.657	1575.154	2011.408
	7:00	1141.112	1556.267	1986.930
	7:05	1127.546	1537.361	1962.436
	7:10	1113.935	1518.403	1937.884
	7:15	1100.265	1499.376	1913.255
	7:20	1086.570	1480.325	1888.605
	7:25	1072.911	1461.336	1864.045
	7:30	1059.220	1442.313	1839.453
	7:35	1045.342	1423.048	1814.563
	7:40	1031.373	1403.672	1789.545
	7:45	1017.395	1384.297	1764.539
	7:50	1003.452	1364.984	1739.628
	7:55	989.552	1345.743	1714.819
	8:00	975.694	1326.575	1690.116
	8:05	961.891	1307.496	1665.540
	8:10	948.175	1288.550	1641.148
	8:15	934.635	1269.859	1617.094
	8:20	921.314	1251.480	1593.448
	8:25	908.118	1233.282	1570.046
	8:30	895.037	1215.256	1546.873
	8:35	882.097	1197.433	1523.970
	8:40	869.320	1179.842	1501.374
	8:45	856.733	1162.523	1479.133
	8:50	844.366	1145.512	1457.293
	8:55	832.214	1128.804	1435.849
	9:00	820.475	1112.667	1415.137
	9:05	808.989	1096.880	1394.877
	9:10	797.677	1081.334	1374.929
	9:15	786.538	1066.029	1355.293
	9:20	775.561	1050.950	1335.949
	9:25	764.743	1036.091	1316.890
	9:30	754.069	1021.434	1298.093
	9:35	743.547	1006.991	1279.573
	9:40	733.227	992.827	1261.415
	9:45	723.120	978.958	1243.636
	9:50	713.169	965.307	1226.139
	9:55	703.370	951.865	1208.913
	10:00	693.719	938.630	1191.953
	10:05	684.237	925.629	1175.296
	10:10	674.942	912.887	1158.973
	10:15	665.788	900.341	1142.903
	10:20	656.789	888.009	1127.109
	10:25	648.012	875.984	1111.710
	10:30	639.407	864.194	1096.612
	10:35	630.960	852.623	1081.795
	10:40	622.668	841.265	1067.250
	10:45	614.518	830.101	1052.956
	10:50	606.504	819.123	1038.900
	10:55	598.619	808.323	1025.072
	11:00	590.877	797.720	1011.497
	11:05	583.338	787.396	998.279
	11:10	576.002	777.349	985.415
	11:15	568.806	767.494	972.797
	11:20	561.731	757.804	960.390
	11:25	554.779	748.283	948.199
	11:30	547.974	738.962	936.264
	11:35	541.288	729.803	924.536
	11:40	534.702	720.782	912.984
	11:45	528.211	711.891	901.600
	11:50	521.812	703.126	890.376
	11:55	515.503	694.484	879.311

Bakin Kogi Hydrographs

Day	Time	100-Year	1000-Year	10000-Year
Day 2	12:00	509.272	685.951	868.385
	12:05	503.115	677.520	857.593
	12:10	497.031	669.191	846.931
	12:15	491.029	660.975	836.416
	12:20	485.105	652.868	826.041
	12:25	479.263	644.873	815.812
	12:30	473.538	637.040	805.790
	12:35	467.920	629.355	795.959
	12:40	462.381	621.778	786.266
	12:45	456.914	614.301	776.702
	12:50	451.537	606.947	767.295
	12:55	446.233	599.694	758.018
	13:00	440.993	592.530	748.857
	13:05	435.814	585.451	739.805
	13:10	430.694	578.453	730.858
	13:15	425.631	571.535	722.015
	13:20	420.625	564.696	713.274
	13:25	415.675	557.935	704.635
	13:30	410.781	551.253	696.098
	13:35	405.943	544.650	687.664
	13:40	401.160	538.123	679.329
	13:45	396.433	531.676	671.098
	13:50	391.778	525.328	662.995
	13:55	387.247	519.152	655.112
	14:00	382.838	513.143	647.444
	14:05	378.504	507.238	639.909
	14:10	374.245	501.435	632.506
	14:15	370.056	495.728	625.224
	14:20	365.925	490.100	618.045
	14:25	361.848	484.546	610.960
	14:30	357.818	479.058	603.960
	14:35	353.834	473.633	597.041
	14:40	349.894	468.268	590.200
	14:45	345.997	462.964	583.437
	14:50	342.147	457.724	576.756
	14:55	338.339	452.542	570.152
	15:00	334.571	447.418	563.620
	15:05	330.843	442.348	557.160
	15:10	327.156	437.334	550.772
	15:15	323.516	432.386	544.469
	15:20	319.949	427.540	538.297
	15:25	316.450	422.785	532.243
	15:30	313.002	418.102	526.280
	15:35	309.604	413.487	520.405
	15:40	306.250	408.932	514.607
	15:45	302.942	404.441	508.891
	15:50	299.671	400.002	503.240
	15:55	296.436	395.610	497.652
	16:00	293.235	391.266	492.125
	16:05	290.066	386.967	486.656
	16:10	286.932	382.715	481.247
	16:15	283.831	378.510	475.899
	16:20	280.763	374.351	470.611
	16:25	277.730	370.240	465.384
	16:30	274.730	366.175	460.217
	16:35	271.766	362.158	455.112
	16:40	268.842	358.198	450.081
	16:45	265.983	354.327	445.164
	16:50	263.181	350.536	440.348
	16:55	260.428	346.809	435.615
	17:00	257.709	343.131	430.944
	17:05	255.026	339.502	426.337
	17:10	252.388	335.934	421.807
	17:15	249.783	332.410	417.335
	17:20	247.209	328.931	412.919
	17:25	244.670	325.498	408.563
	17:30	242.162	322.110	404.264
	17:35	239.685	318.762	400.016
	17:40	237.237	315.456	395.822
	17:45	234.819	312.190	391.680
	17:50	232.431	308.964	387.589
	17:55	230.068	305.774	383.545
	18:00	227.732	302.621	379.548
	18:05	225.429	299.514	375.609
	18:10	223.181	296.482	371.768
	18:15	220.982	293.517	368.012
	18:20	218.814	290.594	364.308
	18:25	216.671	287.705	360.649
	18:30	214.553	284.850	357.033
	18:35	212.458	282.027	353.458
	18:40	210.385	279.234	349.922
	18:45	208.332	276.469	346.421
	18:50	206.298	273.730	342.954
	18:55	204.283	271.017	339.521
	19:00	202.288	268.332	336.122
	19:05	200.313	265.675	332.761
	19:10	198.363	263.051	329.442
	19:15	196.432	260.454	326.158
	19:20	194.518	257.880	322.903
	19:25	192.621	255.330	319.680
	19:30	190.746	252.811	316.496
	19:35	188.910	250.345	313.379
	19:40	187.102	247.916	310.311
	19:45	185.310	245.510	307.272
	19:50	183.533	243.125	304.258
	19:55	181.770	240.759	301.271
	20:00	180.022	238.413	298.309
	20:05	178.287	236.086	295.370
	20:10	176.563	233.774	292.453
	20:15	174.851	231.478	289.554
	20:20	173.148	229.196	286.675
	20:25	171.456	226.929	283.814
	20:30	169.775	224.677	280.974
	20:35	168.104	222.439	278.152
	20:40	166.443	220.214	275.347
	20:45	164.792	218.005	272.562
	20:50	163.154	215.813	269.800
	20:55	161.536	213.650	267.075
	21:00	159.944	211.522	264.394
	21:05	158.367	209.414	261.740
	21:10	156.801	207.321	259.105
	21:15	155.244	205.241	256.486
	21:20	153.695	203.172	253.882
	21:25	152.153	201.113	251.291
	21:30	150.618	199.064	248.712
	21:35	149.090	197.025	246.146
	21:40	147.569	194.995	243.593
	21:45	146.054	192.973	241.049
	21:50	144.544	190.959	238.516
	21:55	143.040	188.953	235.994
	22:00	141.541	186.954	233.481
	22:05	140.049	184.965	230.980
	22:10	138.562	182.984	228.491
	22:15	137.083	181.012	226.013
	22:20	135.612	179.052	223.550
	22:25	134.155	177.112	221.113
	22:30	132.707	175.185	218.692
	22:35	131.265	173.266	216.282
	22:40	129.830	171.356	213.884
	22:45	128.402	169.455	211.498
	22:50	126.980	167.564	209.123
	22:55	125.565	165.681	206.760
	23:00	124.156	163.808	204.409
	23:05	122.755	161.944	202.070
	23:10	121.359	160.088	199.742
	23:15	119.969	158.241	197.424
	23:20	118.587	156.404	195.121
	23:25	117.213	154.578	192.831
	23:30	115.847	152.763	190.555
	23:35	114.489	150.959	188.292
	23:40	113.138	149.165	186.044
	23:45	111.798	147.386	183.813
	23:50	110.473	145.627	181.609
	23:55	109.157	143.881	179.422

Bakin Kogi Hydrographs

	Time	100-Year	1000-Year	10000-Year
Day 3	0:00	107.848	142.145	177.246
	0:05	106.547	140.418	175.083
	0:10	105.252	138.701	172.933
	0:15	103.965	136.994	170.794
	0:20	102.685	135.297	168.669
	0:25	101.412	133.609	166.555
	0:30	100.145	131.929	164.452
	0:35	98.883	130.256	162.358
	0:40	97.627	128.591	160.274
	0:45	96.376	126.934	158.200
	0:50	95.131	125.285	156.136
	0:55	93.893	123.645	154.083
	1:00	92.660	122.012	152.041
	1:05	91.432	120.387	150.008
	1:10	90.213	118.774	147.989
	1:15	89.009	117.179	145.996
	1:20	87.813	115.598	144.018
	1:25	86.625	114.025	142.052
	1:30	85.443	112.463	140.098
	1:35	84.269	110.909	138.156
	1:40	83.101	109.364	136.224
	1:45	81.939	107.827	134.303
	1:50	80.781	106.298	132.390
	1:55	79.630	104.773	130.486
	2:00	78.485	103.259	128.593
	2:05	77.346	101.754	126.712
	2:10	76.214	100.257	124.841
	2:15	75.087	98.767	122.979
	2:20	73.966	97.285	121.127
	2:25	72.850	95.810	119.284
	2:30	71.740	94.342	117.450
	2:35	70.635	92.882	115.625
	2:40	69.538	91.432	113.813
	2:45	68.448	89.991	112.013
	2:50	67.365	88.560	110.225
	2:55	66.288	87.137	108.448
	3:00	65.219	85.724	106.684
	3:05	64.156	84.321	104.931
	3:10	63.101	82.927	103.189
	3:15	62.052	81.542	101.460
	3:20	61.012	80.168	99.744
	3:25	59.981	78.807	98.045
	3:30	58.960	77.459	96.362
	3:35	57.949	76.124	94.696
	3:40	56.952	74.809	93.053
	3:45	55.969	73.511	91.435
	3:50	54.996	72.228	89.834
	3:55	54.034	70.958	88.249
	4:00	53.081	69.701	86.681
	4:05	52.139	68.459	85.130
	4:10	51.208	67.230	83.597
	4:15	50.286	66.014	82.080
	4:20	49.374	64.811	80.580
	4:25	48.472	63.622	79.095
	4:30	47.580	62.445	77.627
	4:35	46.697	61.281	76.176
	4:40	45.825	60.131	74.741
	4:45	44.964	58.996	73.325
	4:50	44.116	57.877	71.930
	4:55	43.279	56.773	70.554
	5:00	42.453	55.685	69.196
	5:05	41.638	54.611	67.857
	5:10	40.835	53.552	66.537
	5:15	40.043	52.508	65.235
	5:20	39.262	51.479	63.951
	5:25	38.492	50.465	62.687
	5:30	37.738	49.471	61.448
	5:35	36.995	48.493	60.230
	5:40	36.264	47.530	59.030
	5:45	35.544	46.582	57.848
	5:50	34.834	45.647	56.683
	5:55	34.135	44.726	55.535
	6:00	33.445	43.818	54.404
	6:05	32.766	42.923	53.289
	6:10	32.095	42.041	52.190
	6:15	31.435	41.172	51.107
	6:20	30.784	40.315	50.039
	6:25	30.143	39.471	48.988
	6:30	29.512	38.640	47.952
	6:35	28.890	37.821	46.932
	6:40	28.276	37.013	45.927
	6:45	27.672	36.218	44.936
	6:50	27.076	35.434	43.960
	6:55	26.490	34.663	42.999
	7:00	25.913	33.904	42.054
	7:05	25.346	33.157	41.124
	7:10	24.788	32.423	40.209
	7:15	24.239	31.700	39.310
	7:20	23.699	30.991	38.427
	7:25	23.169	30.294	37.559
	7:30	22.648	29.609	36.707
	7:35	22.138	28.938	35.872
	7:40	21.637	28.281	35.054
	7:45	21.148	27.637	34.254
	7:50	20.669	27.009	33.472
	7:55	20.201	26.395	32.709
	8:00	19.745	25.796	31.964
	8:05	19.300	25.211	31.238
	8:10	18.866	24.643	30.533
	8:15	18.448	24.096	29.853
	8:20	18.048	23.572	29.203
	8:25	17.661	23.065	28.574
	8:30	17.284	22.572	27.963
	8:35	16.918	22.094	27.370
	8:40	16.563	21.629	26.794
	8:45	16.217	21.177	26.234
	8:50	15.881	20.738	25.689
	8:55	15.554	20.310	25.159
	9:00	15.235	19.893	24.642
	9:05	14.923	19.485	24.137
	9:10	14.619	19.087	23.644
	9:15	14.321	18.699	23.162
	9:20	14.030	18.319	22.691
	9:25	13.745	17.947	22.230
	9:30	13.467	17.584	21.780
	9:35	13.195	17.228	21.340
	9:40	12.929	16.881	20.910
	9:45	12.669	16.541	20.489
	9:50	12.415	16.209	20.077
	9:55	12.166	15.884	19.674
	10:00	11.922	15.566	19.280
	10:05	11.684	15.255	18.895
	10:10	11.451	14.951	18.518
	10:15	11.224	14.653	18.150
	10:20	11.001	14.363	17.789
	10:25	10.783	14.078	17.437
	10:30	10.570	13.799	17.092
	10:35	10.361	13.527	16.754
	10:40	10.157	13.260	16.423
	10:45	9.956	12.999	16.099
	10:50	9.761	12.743	15.783
	10:55	9.569	12.493	15.473
	11:00	9.382	12.249	15.171
	11:05	9.199	12.009	14.874
	11:10	9.020	11.775	14.584
	11:15	8.844	11.546	14.300
	11:20	8.671	11.320	14.021
	11:25	8.502	11.099	13.746
	11:30	8.335	10.881	13.477
	11:35	8.172	10.668	13.213
	11:40	8.011	10.459	12.953
	11:45	7.853	10.252	12.698
	11:50	7.699	10.050	12.448
	11:55	7.547	9.852	12.202

Bakin Kogi Hydrographs

	Time	100-Year	1000-Year	10000-Year
Day 3	12:00	7.398	9.658	11.961
	12:05	7.252	9.467	11.725
	12:10	7.109	9.280	11.494
	12:15	6.968	9.097	11.267
	12:20	6.831	8.917	11.044
	12:25	6.696	8.741	10.826
	12:30	6.563	8.568	10.612
	12:35	6.434	8.399	10.402
	12:40	6.306	8.232	10.196
	12:45	6.181	8.069	9.994
	12:50	6.058	7.909	9.795
	12:55	5.938	7.751	9.600
	13:00	5.820	7.597	9.409
	13:05	5.704	7.446	9.221
	13:10	5.590	7.297	9.038
	13:15	5.478	7.152	8.857
	13:20	5.369	7.009	8.680
	13:25	5.262	6.869	8.507
	13:30	5.157	6.732	8.338
	13:35	5.054	6.598	8.172
	13:40	4.954	6.467	8.009
	13:45	4.856	6.338	7.850
	13:50	4.759	6.213	7.694
	13:55	4.665	6.090	7.542
	14:00	4.572	5.969	7.392
	14:05	4.481	5.850	7.245
	14:10	4.392	5.733	7.101
	14:15	4.304	5.619	6.959
	14:20	4.218	5.506	6.819
	14:25	4.134	5.396	6.682
	14:30	4.050	5.287	6.548
	14:35	3.969	5.181	6.416
	14:40	3.889	5.076	6.287
	14:45	3.811	4.974	6.160
	14:50	3.734	4.874	6.036
	14:55	3.658	4.775	5.914
	15:00	3.585	4.679	5.795
	15:05	3.512	4.585	5.678
	15:10	3.441	4.492	5.563
	15:15	3.372	4.402	5.451
	15:20	3.304	4.313	5.341
	15:25	3.237	4.226	5.234
	15:30	3.172	4.141	5.128
	15:35	3.108	4.057	5.024
	15:40	3.045	3.974	4.922
	15:45	2.983	3.894	4.822
	15:50	2.922	3.814	4.724
	15:55	2.863	3.737	4.628
	16:00	2.804	3.661	4.533
	16:05	2.747	3.586	4.441
	16:10	2.691	3.513	4.350
	16:15	2.636	3.441	4.261
	16:20	2.582	3.371	4.174
	16:25	2.530	3.302	4.089
	16:30	2.478	3.234	4.006
	16:35	2.428	3.169	3.924
	16:40	2.378	3.104	3.844
	16:45	2.330	3.041	3.766
	16:50	2.282	2.979	3.689
	16:55	2.236	2.918	3.614
	17:00	2.190	2.859	3.540
	17:05	2.145	2.800	3.468
	17:10	2.102	2.743	3.397
	17:15	2.058	2.687	3.327
	17:20	2.016	2.632	3.259
	17:25	1.975	2.578	3.192
	17:30	1.934	2.524	3.126
	17:35	1.894	2.473	3.062
	17:40	1.855	2.422	2.999
	17:45	1.817	2.372	2.937
	17:50	1.780	2.323	2.877
	17:55	1.743	2.275	2.817
	18:00	1.707	2.228	2.759
	18:05	1.672	2.182	2.703
	18:10	1.638	2.138	2.647
	18:15	1.604	2.093	2.592
	18:20	1.571	2.050	2.539
	18:25	1.538	2.008	2.486
	18:30	1.506	1.966	2.434
	18:35	1.475	1.925	2.384
	18:40	1.444	1.885	2.334
	18:45	1.414	1.845	2.285
	18:50	1.384	1.807	2.237
	18:55	1.355	1.769	2.190
	19:00	1.327	1.731	2.144
	19:05	1.299	1.695	2.099
	19:10	1.271	1.659	2.055
	19:15	1.245	1.624	2.012
	19:20	1.218	1.590	1.969
	19:25	1.193	1.557	1.928
	19:30	1.168	1.524	1.887
	19:35	1.143	1.492	1.847
	19:40	1.119	1.460	1.808
	19:45	1.095	1.429	1.769
	19:50	1.071	1.398	1.731
	19:55	1.048	1.368	1.694
	20:00	1.026	1.339	1.658
	20:05	1.004	1.310	1.622
	20:10	0.982	1.282	1.587
	20:15	0.961	1.254	1.553
	20:20	0.940	1.227	1.519
	20:25	0.919	1.200	1.486
	20:30	0.899	1.174	1.453
	20:35	0.880	1.148	1.421
	20:40	0.860	1.123	1.390
	20:45	0.841	1.098	1.360
	20:50	0.823	1.074	1.330
	20:55	0.805	1.050	1.301
	21:00	0.787	1.027	1.272
	21:05	0.770	1.004	1.244
	21:10	0.752	0.982	1.216
	21:15	0.735	0.960	1.189
	21:20	0.719	0.938	1.162
	21:25	0.703	0.917	1.135
	21:30	0.687	0.896	1.109
	21:35	0.671	0.875	1.084
	21:40	0.655	0.855	1.059
	21:45	0.640	0.835	1.034
	21:50	0.625	0.816	1.010
	21:55	0.611	0.797	0.987
	22:00	0.596	0.778	0.964
	22:05	0.582	0.760	0.941
	22:10	0.568	0.742	0.919
	22:15	0.555	0.724	0.897
	22:20	0.542	0.707	0.875
	22:25	0.529	0.690	0.854
	22:30	0.516	0.673	0.834
	22:35	0.504	0.657	0.814
	22:40	0.491	0.641	0.794
	22:45	0.479	0.625	0.774
	22:50	0.467	0.610	0.755
	22:55	0.456	0.595	0.736
	23:00	0.444	0.580	0.718
	23:05	0.433	0.565	0.700
	23:10	0.422	0.551	0.682
	23:15	0.412	0.537	0.665
	23:20	0.401	0.523	0.648
	23:25	0.391	0.510	0.631
	23:30	0.381	0.497	0.615
	23:35	0.371	0.484	0.599
	23:40	0.361	0.472	0.584
	23:45	0.352	0.459	0.569
	23:50	0.343	0.447	0.554
	23:55	0.334	0.435	0.539

Bakin Kogi Hydrographs

	Time	100-Year	1000-Year	10000-Year
Day 4	0:00	0.325	0.424	0.525
	0:05	0.316	0.413	0.511
	0:10	0.308	0.401	0.497
	0:15	0.299	0.391	0.484
	0:20	0.291	0.380	0.470
	0:25	0.283	0.369	0.457
	0:30	0.275	0.359	0.445
	0:35	0.268	0.349	0.432
	0:40	0.260	0.339	0.420
	0:45	0.253	0.330	0.408
	0:50	0.245	0.320	0.397
	0:55	0.238	0.311	0.385
	1:00	0.231	0.302	0.374
	1:05	0.225	0.293	0.363
	1:10	0.218	0.285	0.352
	1:15	0.212	0.276	0.342
	1:20	0.205	0.268	0.332
	1:25	0.199	0.260	0.322
	1:30	0.193	0.252	0.312
	1:35	0.187	0.244	0.302
	1:40	0.181	0.236	0.293
	1:45	0.175	0.229	0.284
	1:50	0.170	0.222	0.274
	1:55	0.164	0.214	0.266
	2:00	0.159	0.207	0.257
	2:05	0.154	0.200	0.248
	2:10	0.148	0.194	0.240
	2:15	0.143	0.187	0.232
	2:20	0.138	0.181	0.224
	2:25	0.134	0.174	0.216
	2:30	0.129	0.168	0.208
	2:35	0.124	0.162	0.201
	2:40	0.120	0.156	0.194
	2:45	0.115	0.151	0.186
	2:50	0.111	0.145	0.180
	2:55	0.107	0.140	0.173
	3:00	0.103	0.134	0.166
	3:05	0.099	0.129	0.160
	3:10	0.095	0.124	0.154
	3:15	0.091	0.119	0.148
	3:20	0.088	0.114	0.142
	3:25	0.084	0.110	0.136
	3:30	0.081	0.105	0.131
	3:35	0.078	0.101	0.125
	3:40	0.074	0.097	0.120
	3:45	0.071	0.093	0.115
	3:50	0.068	0.089	0.110
	3:55	0.065	0.085	0.105
	4:00	0.062	0.081	0.101
	4:05	0.060	0.078	0.096
	4:10	0.057	0.074	0.092
	4:15	0.054	0.071	0.088
	4:20	0.052	0.067	0.083
	4:25	0.049	0.064	0.080
	4:30	0.047	0.061	0.076
	4:35	0.045	0.058	0.072
	4:40	0.042	0.055	0.068
	4:45	0.040	0.052	0.065
	4:50	0.038	0.050	0.062
	4:55	0.036	0.047	0.058
	5:00	0.034	0.045	0.055
	5:05	0.032	0.042	0.052
	5:10	0.030	0.040	0.049
	5:15	0.029	0.038	0.046
	5:20	0.027	0.035	0.044
	5:25	0.026	0.033	0.041
	5:30	0.024	0.031	0.039
	5:35	0.023	0.029	0.036
	5:40	0.021	0.028	0.034
	5:45	0.020	0.026	0.032
	5:50	0.018	0.024	0.030
	5:55	0.017	0.022	0.028
	6:00	0.016	0.021	0.026
	6:05	0.015	0.019	0.024
	6:10	0.013	0.018	0.022
	6:15	0.012	0.016	0.020
	6:20	0.011	0.015	0.018
	6:25	0.010	0.014	0.017
	6:30	0.009	0.012	0.015
	6:35	0.008	0.011	0.014
	6:40	0.008	0.010	0.012
	6:45	0.007	0.009	0.011
	6:50	0.006	0.008	0.010
	6:55	0.005	0.007	0.009
	7:00	0.005	0.006	0.008
	7:05	0.004	0.005	0.007
	7:10	0.003	0.004	0.006
	7:15	0.003	0.004	0.005
	7:20	0.002	0.003	0.004
	7:25	0.002	0.003	0.003
	7:30	0.002	0.002	0.003
	7:35	0.001	0.002	0.002
	7:40	0.001	0.001	0.001
	7:45	0.001	0.001	0.001
	7:50	0.000	0.001	0.001
	7:55	0.000	0.000	0.000