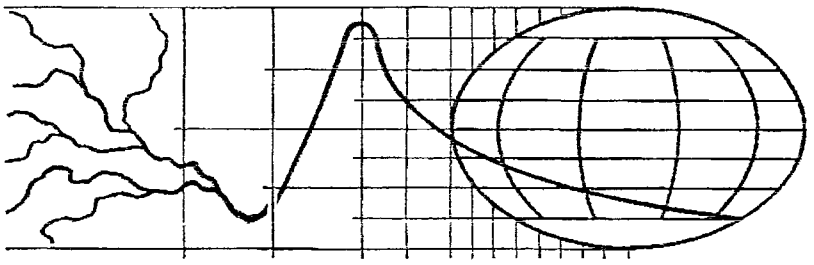
Weltdatenbank Abfluß
Bundesanstalt für Gewässerkunde
Koblenz, Deutschland

Global Runoff Data Centre
Federal Institute of Hydrology
Koblenz, Germany

Report No. 5

Hydrological Regimes of the 20 Largest Rivers of the World
- A Compilation of the GRDC Database -



GRDC

November 1994

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Contents

11. Presentation of GRDC-data of the 20 largest rivers of the world

1. Foreword

An international data base of hydrological data is considered necessary for the validation of Global Circulation Models (GCM's), the detection of regional and global changes in the hydrological regimes and various aspects of water resources development and management.

The Global Runoff Data Centre (GRDC) operates under auspices of the World Meteorological Organization (WMO) and is implemented at the Federal Institute of Hydrology in Koblenz, Germany. The frame for the operation of the GRDC is laid out in the Project A.5 of the World Climate Programme - Water (WCP-Water) of the WMO. An International Steering Committee guides and advises on the activities of the GRDC.

The GRDC contributes to the WCP-Water Project A.8 " Detecting Global and Regional Runoff Trends by Monitoring Discharges of Selected Rivers". The background for this project is the expectation, that changes in climate will affect the river runoff regime. Therefore it is important to monitor time series of discharge for selected rivers on a routine basis (WCP-Water 6th Planning Meeting, 1993; WMO, 1994). One criteria for the selection of rivers is to monitor the discharge for the largest rivers of the world. In this report, the 20 largest rivers with regard to discharge and basin size have been selected and the entire GRDC data base for these rivers has been compiled and graphically displayed in their geographical context. This sets the starting point for a series of update reports which are then based on the update of the data base by the national hydrological services and the response of data users. As for several stations of the 20 largest rivers of the world long-term records are available, this report contributes also to the WCP-Water Project A.2 "Analyzing Long Time Series of Hydrological Data and Indices with Respect to Climate Variability and Change".

The compilation of a report like this is a collaborative effort of the national hydrological services, international organizations and projects and the inputs of the community of data users. The GRDC therefore calls for the support of its activities through the continued data supply to the Centre, the contribution of data through international and bilateral projects and suggestions and comments by the data users in the various fields. Errors or inaccuracies in this report should also be reported to the Centre.

Next to data supply, there exists the urgent need to complement the database with information about the history of hydrological stations as wells as river regulations and abstractions, hydropower generation and water use which affect the natural flow of the rivers.

Further information of the GRDC database and user support can be obtained from:

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Koblenz, November 1994

2. Background

In this GRDC report 20 rivers have been compiled, including the 15 largest rivers of the world in terms of mean monthly discharge as well as the 15 largest rivers in terms of drainage basin size (MARCINEK, ROSENKRANZ, 1989).

The objective of the report is the presentation of the entire GRDC data base for these rivers as of June 1994 and the visualization of general regime characteristics for the rivers and major tributaries. For the first time, the location of the GRDC - stations are shown in maps of the drainage basin for each river.

The report is in a way a follow-up of three previous reports, namely the UNESCO Technical Document "Hydrological characteristics of Selected Rivers of the World" (McMAHON, 1982), the IIASA Collaborative Paper "On the Occurrence of Climate Variability and Change within Hydrological Time Series" (MITOSEK, 1992) and the Report No. 100 by the Max-Planck-Institute for Meteorology and the GRDC (DÜMENIL et al, 1993) where the attempt has been made to characterize selected rivers and to present the data base available at that time.

3. Data situation

For many rivers, daily as well as monthly discharge data are available. The responsibility for the quality of the data rests with the hydrological services who compile and process discharge data. At present, the GRDC does not have the facilities to carry out a full data screening procedure. However, the data were checked for most obvious errors and when detected in a few cases, these errors were rectified or the data in question were omitted from further processing. Gaps in the time series were not filled by statistical methods.

The difficulty to work with global data sets for a successive number of years becomes apparent from Table 4: The time series for the stations close to the mouth of the oceans were compiled and show, that only for a few rivers time series are common for a number of successive years. The GRDC endevours to close the time gaps and update the database with the active participation of the national hydrological services concerned.

4. Presentation of rivers

The presentation of each river in this report follows the following scheme:

The tables for each river indicate the available GRDC-data for each river in terms of stations and time series.

The numbers in column 1 of these tables refer to the station numbers for each river as plotted in the maps of the drainage basins.

The maps display the geographical situation and location of the GRDC gauging stations. The drainage basin maps have been imported from the UNEP - GEMS/WATER software RAISON.

The figures following the drainage basin maps display for selected stations the graphs of the mean monthly runoff, the mean yearly discharge and the linear trend line of the runoff. The trend calculation is omitted in those cases, where a significant interruption in the time series occurs. It must be noted, that the linear trend calculation is a very simple tool to show "what has happened" to basin runoff over a number of years. It cannot substitute more sophisticated analysis methods (MITOSEK, 1992; CAVADIAS, 1992). The trend graph indicates, whether the discharge at a given station has been changing over the years. The causes for an observed trend are difficult to find out, as most rivers are influenced by anthropogenic factors (dams, irrigation etc.) and the discharge data at least at the downstream stations do not necessarily reflect the natural flow of these rivers. An obvious example is the hydrological regime of the Nile river after the begin of the operation of the Assuan dam. Small changes may be masked by measurement errors. A possible climate "signal" can only be confirmed, if for a number of stations of different rivers additional data on the station history (consistency of the data series) and anthropogenic influences are available. The GRDC at present does not have this information. However, MITOSEK (1992) after statistical analysis of 150 time series of the GRDC data base using MANN's test suggested, that a climate change has occured within the considered time series.

Next to the figures of the mean monthly runoff, the mean yearly discharge and the linear trend line of the runoff follow graphs of the range of discharge for selected stations. In most cases, the stations selected are the same than for the runoff and discharge figures. In a few cases, also stations with shorter time series have been added to make better use of the information base. The range of discharge has been plotted over the mean monthly discharge. The presentation of the actual range of discharge has been given preference to the presentation of the standard deviation for practical purposes: It can be seen, that the range between the mean monthly runoff (averaged over the available time series) and the maximum and minimum mean monthly discharge, respectively, are not equal in many cases. These graphs are particularly useful to determine, for which rivers changes in the hydrological regime, e.g. because of a climate change, may have a serious impact.

In general, for rivers with a large natural range of discharge, change "signals" are likely to be masked and real changes are unlikely to produce a discharge regime significantly different from the present one. On the contrary, hydrological regimes of rivers with a low range of discharge between maximum and minimum mean monthly discharge can be severely affected by climatic or otherwise induced changes with all subsequent ecological and socio-economic consequences. It should be noted here, that the minimum average monthly discharge is a good indicator for the assessment of minimum availability of water which is important for water resource planning and management.

5. Selection of stations

The selection of stations of the rivers displayed in the figures followed the idea to allow a first-glance characterization of the hydrological regime of the river and its major tributaries. As the report would have become unwieldy if all stations had been graphically presented, the additional selection criteria were:

- The station hydrographs should give examples for the flow regimes of the upper, middle and lower course of each river and/or important tributaries.

- The largest drainage basins for the stations were given preference to represent an area as large as possible.

- Of a number of available stations for the main streams and/or important tributaries, those with the longest available time series were selected or those with the longest un-interrupted time series.

6. Summary of river data

In Table 1, the 20 largest rivers of the world with respect to drainage basin size discharge and runoff are listed.

The stations listed refer to the GRDC gauging stations nearest to the mouth of each river. In some cases, the stations are indeed close to the river mouth into the oceans. In several cases the station nearest to the mouth may be in reality far away from the actual river mouth. This is due either because there is no station nearer to the mouth of the river (e.g. the station Obidos at the Amazone river, approx. 600 km inland of the mouth), or because there is no GRDC data available for the nearest station. The latter is the case at the Niger river, where information from the Niger river in Nigeria is completely lacking as of now.

The drainage basin size is station-oriented and therefore differs from the total drainage basin size for the respective rivers given in other sources.

The numbers in column 1 of Table 1 refer to the order number of the river in the report and do not indicate a ranking of the rivers.

7. Source of data and methods of computation

The data compiled is drawn exclusively from the GRDC database and may therefore differ from other sources.

All values have been calculated from mean monthly discharges for the available time series. The maximum and minimum discharges are actual maximum and minimum mean monthly discharges of the respective river. The mean monthly runoff is calculated from the mean monthly discharge over all available monthly values.

The values in Table 2 have been calculated in the following manner: The gauging stations of Table 1 with the associated basin sizes and time series are the base figures for the calculation of the values of Table 2. The Mean Annual Discharge has been calculated from the time series with complete calender years (In Table 1 the mean discharge has been calculated for all available months). In case of missing months in a given calendar year, this leads to slight deviations of the mean values calculated for Table 1 and Table 2.

Likewise, the minimum and maximum annual discharge has been calculated from the discharge sum of all available complete calender years. This allows the allocation of minimum and maximum annual discharges to specific years of occurrence, while the mean annual discharge can be allocated to the year which comes closest to the arithmetic mean annual discharge.

The mean volume of discharge per year in km^3 is calculated from the mean annual discharge values for each river.

To supplement the information of the 20 largest rivers with some statistical characteristics, Table 3 has been compiled from the study of McMAHON (1982). Only those stations were selected which are in common for this report and the McMAHON study. For a detailed description of the statistics used, reference is made to McMAHON (1982). From several remarkable hydrological characteristics, the value of the coefficient of variation C_V is dependant on the regional climate of the river basin. McMAHON concludes, that "rivers in tropical and cold regions are 25% less variable than those in semi-arid and temperate regions". This result coincides with the observations from the figures of the range of discharge of the rivers presented in this report. With respect to climate modelling, the computation of the persistence r_1 as the lag-one serial correlation coefficient is of special importance. For unregulated rivers or rivers with negligable storage processes in the basin (e.g. lakes) r_1 would be close to zero. The large effects of internal storage become evident e.g. in the case of the Niger river: The station with the highest persistence index is located just below the inner delta of the Niger; the Dire station is located just upstream of the inner delta and the Koulikoro station is inside the inner delta. On the opposite, rivers like the Lena, Yenisei, Parana and Mekong show little persistence.

8. Availability of data

The base data for the compilation of this report are available on a 1.4 MB 3.5'' diskette from the GRDC. The diskette is delivered free of charge on the following conditions: The request must reach the Centre in writing and the data user is obliged to outline in a summary the intended use of the data. The user also agrees to make available to the Centre results of the research/studies undertaken with the data set. This information is required as a feed back to the hydrological services which transmit data to the GRDC and to build up an information basis about the research/studies undertaken with the GRDC data. This information base helps to network researchers to inform about other research activities in the same field.

The diskette contains the following information:

The full text and tables of the printed report, the river catalogue, the data (mean monthly discharge for all rivers and tributaries which are listed in the river tables of this report) and a text file which explains the format of the data. Tables 5 and 6 show the organization of the river catalogue and the data format. Customized data products may be produced on special request.

9. Acknowledgements

The compilation of this report had not been possible without the active support of the GRDC by the national hydrological services of the world who maintain hydrological networks often under most adverse conditions. Their contribution cannot be overestimated.

The discussions and contributions of **Dr. K. Wilke**, Head of Section "Water Balance Computations, Forecast Models" at the Federal Institute of Hydrology, Koblenz, Germany helped greatly in the conception of the report. Thanks go also to **Dr. E. Ongley**, Director, and **D. Kay**, GEMS-Water Collaborating Centre, National Water Research Institute, Burlington, Canada, for their assistance with the RAISON GIS-software and the permission to use digitized drainage basins in this report.

10. References

T.A. McMahon (1982) — Hydrological Characteristics of Selected Rivers of the World, UNESCO, Paris.

J. Marcinek, E. Rosenkranz (1989) — Das Wasser der Erde. Lehrbuch der geographischen Meeres- und Gewässerkunde. Publ. Deutsch, Thun.

G. S. Cavadias (1992) — A survey of current approaches to modelling of hydrological time-series with repsect to climate variability and change. WCASP-23, WMO/TD-No.534, Geneva.

H. T. Mitosek (1992) — Occurence of Climate Variability and Change within the Hydrological Time Series. A Statistical Approach. IIASA Collaborative Paper No. CP-92-05, Laxenburg.

L.Dümenil, K. Isele, H.-J. Liebscher, U. Schröder, M. Schumacher, K. Wilke (1993) — Discharge Data from 50 Selected Rivers for GCM Validation. MPI-Report No. 100, Max-Planck-Institut für Meteorologie & GRDC.

WMO - World Meteorological Organization (1994) — Sixth Planning Meeting on World Climate Programme - Water. WCASP-29, WMO/TD-No. 609, Geneva.

Note

Maps produced by the GRDC are not to be taken as necessarily representing the view of the GRDC on boundaries or the political status.

No.	River	Drainage Basin (km^2)	Monthly discharge in m^3/s			Mean monthly Runoff (mm)	Time series
			Mean	Max.	Min.		
1	Amazone at Obidos	4.640.300	155.702	246.000	144.000	87	1928-1983
2	Amur at Komsomolsk	1.730.000	9.739	33.100	374	15	1933-1984
3	Brahmaputra at Bahadurabad	636.130	18.648	56.190	3.314	76	1969-1975
4	Ganges at Farakka	935.000	12.037	65.072	1.181	33	1949-1973
5	Irrawaddy at Sagaing	117.900	8.137	25.608	1.423	179	1978-1988
6	Lena at Kusur	1.430.000	16.622	96.600	429	30	1935-1984
7	Mackenzie at Norman Wells	1.570.000	9.505	24.742	2.132	16	1943-1990
8	Mekong at Pakse	545.000	9.514	34.647	1.482	45	1980-1990
9	Mississippi at Tarbert Landing	3.923.799	14.737	38.900	4.670	10	1965-1984
10	Niger at Malanville	1.000.000	1.144	2.817	19	3	1952-1991
11	Nile at El Ekhsase	?	1.251	1.877	735	---	1973-1984
12	Ob at Salekhard	2.949.998	12.504	43.423	2.120	97	1930-1984
13	Orinoko at Puente Angostura	836.000	31.157	85.964	3.512	22	1923-1989
14	Rio de la Plata (Parana at Corrientes)	1.950.000	16.595	54.000	4.092	22	1904-1983
15	St. Lawrence at Cornwall, Ontario	774.410	7.944	9.910	6.020	27	1973-1984
16	Volga at Volgograd Power Plant	1.360.000	8.087	39.400	1.140	15	1879-1984
17	Yangtse at Datong	1.705.383	25.032	54.500	7.220	38	1976-1979
18	Yenisei at Igarka	2.440.000	17.683	112.000	3.120	19	1936-1984
19	Zaire/Congo at Kinshasa	3.475.000	40.250	80.833	22.352	30	1903-1983
20	Zambesi at Matundo-Cais	940.000	3.309	12.382	540	9	1976-1979

Table 1: The 20 largest rivers of the world; general characteristics and time series of data.

River	Mean annual discharge (m^3/s)	Mean annual runoff (mm)	Minimum annual discharge (m^3/s)	Minimum annual runoff (mm)	Maximum annual discharge (m^3/s)	Maximum annual runoff (mm)	Mean volume of discharge per year (km^3/a)	Year of occurrence (Mean/Min/Max annual discharge)
Amazone	155.432	1.056	133.267	906	176.067	1.197	4.901	1935/1936/1975
Amur	9.739	178	6.087	111	14.228	259	307	1935/1979/1956
Brahmaputra	19.674	975	18.147	900	21.753	1.078	620	1969/1973/1974
Ganges	12.037	406	7.732	261	17.217	581	380	1953/1972/1955
Irrawaddy	8.173	2.176	6.926	1.853	9.993	2.673	258	1980/1986/1988
Lena	16.622	367	13.234	292	19.978	441	524	1937/1954/1961
Mackenzie	8.463	170	7190	144	9.884	199	267	1990/1970/1988
Mekong	9.334	540	7.707	446	11.356	657	294	1983/1987/1990
Mississippi	14.703	118	10.203	82	20.421	164	464	1966/1976/1973
Niger	1.121	35	698	22	1.620	51	35	1960/1973/1955
Nile	1.251	--	1.131	--	1.390	--	39	1981/1973/1978
Ob	12.501	134	8.791	94	17.812	190	394	1943/1967/1979
Orinoko	31.061	1.172	21.540	813	37.593	1.418	980	1978/1926/1954
Rio de la Plata (Parana)	16.358	265	9.413	152	25.583	414	516	1907/1944/1905
St.Lawrence	7.931	323	7.328	298	8.727	355	250	1975/1977/1973
Volga	8.087	188	5.181	120	12.355	286	255	1913/1921/1926
Yangtse	25.032	463	21.377	395	28.882	534	789	1979/1978/1977
Yenisei	17.683	229	11.584	150	20.966	271	558	1981/1983/1974
Zaire	40.250	365	32.873	298	54.963	499	1.269	1921/1919/1962
Zambesi	3.337	112	2.322	78	5.758	193	105	1977/1976/1978

Table 2: Discharge and runoff characteristics of the 20 largest rivers of the world at GRDC-stations close to the mouth of the rivers into the oceans (explanations see text).

River	Station	MAR	C_V	C_s	r_1	$\bar{q}$	I_V	g	$\frac{\bar{q}_{100}}{\bar{q}}$
Amazone	Obidos	1010	0.06	0.03	-0.09	22.22	0.02	> 3	n.a.
Amur	Komsomolsk	184	0.19	-0.10	0.34	66.66	0.10	0.51	1.8
Lena	Kusur	214	0.11	0.27	0.16	17.54	0.09	0.34	1.7
Mekong	Mukdahar	671	0.12	-0.10	0.29	n.a.	n.a.	n.a.	n.a.
Mississippi	Alton	187	0.28	0.03	0.29	58.82	0.14	-0.47	1.8
Niger	Dire	109	0.18	0.24	0.72	142.9	0.04	> 3	n.a.
Niger	Koulikoro	409	0.21	0.33	0.52	19.23	0.09	1.14	1.8
Niger	Mopti	139	0.11	0.54	0.48	100.0	0.02	< - 3	n.a.
Ob	Salekhard	158	0.15	0.51	0.47	10.42	0.04	> 3	n.a.
Parana	Guaira	328	0.21	0.38	0.10	45.45	0.09	1.17	1.9
St. Lawrence	Ogdensburg	279	0.09	-0.23	0.71	100.0	0.05	-0.32	1.2
Volga	Volgograd	197	0.18	0.10	0.42	38.46	0.10	-0.69	1.5
Yenisei	Igaraka	229	0.07	-0.10	0.01	22.73	0.16	< - 3	n.a.

MAR: Mean annual runoff in mm; C_V: Coefficient of variation;
C_s: Skewness; r_1: Lag-one serial correlation coefficient (persistence);
$\bar{q}$: Specific mean peak discharge related to MAR; I_V: Index of variability of peak annual discharge;
g : Coefficient of skewness of peak annual discharges in log-domain
$\frac{\bar{q}_{100}}{\bar{q}}$: Estimated peak 100-year discharge; n.a. : not available

Table 3: Statistical characteristics of selected rivers
(compiled after McMAHON, 1982)

River	Time series	1880	1885	1890	1895	1900	1905	1910	1915	1920	1925	1930	1935	1940	1945	1950	1955	1960	1965	1970	1975	1980	1985	1990	1995
Amazone at Obidos	1928-1983																								
Amur at Komsomolsk	1933-1984																								
Brahmaputra at Bahadurabad	1969-1975																								
Ganges at Farakka	1949-1973																								
Irrawaddy at Sagaing	1978-1988																								
Lena at Kusur	1935-1984																								
Mackenzie at Norman Wells	1943-1990																								
Mekong at Pakse	1980-1990																								
Mississippi at Tarbert Landing	1965-1984																								
Niger at Malanville	1952-1991																								
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Volga at Volgograd Power Plant	1879-1984																								
Yangtse at Datong	1976-1979																								
Yenisei at Igarka	1936-1984																								
Zaire/Congo at Kinshasa	1903-1983																								
Zambesi at Matundo-Cais	1976-1979																								

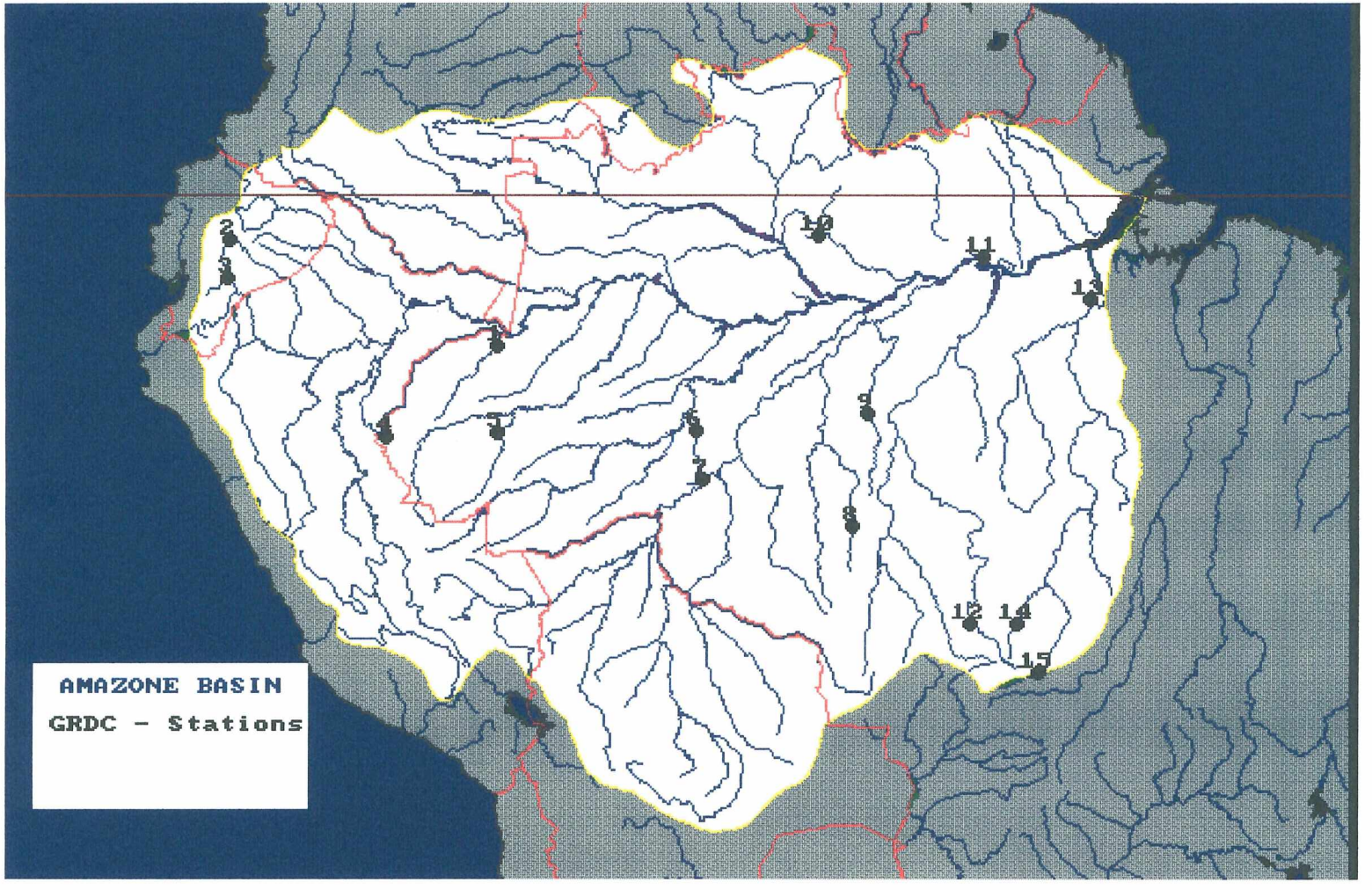
Table 4: Overview of overlapping time series of GRDC-stations close to the mouth of the rivers

```
EXPLANATION OF MONTHLY RUNOFF DATAFILES


A                                          B
AMAZONAS                                   OBIDOS
C   D
1928111000138000181000206000217000214000198000169000011700085300.85500.90200.
1929104000128000142000182000209000215000199000172000013700090900.80100.93900.
1930114000144000171000194000204000201000192000174000013800010100089800.93500.
1931110000133000163000190000201000194000174000140000097600.81500.86400.94000.
1932119000162000188000205000211000208000196000170000013100093500.85800.93000.
1933111000140000166000189000208000207000200000168000010700076900.80500.91400.
1934110000146000182000202000220000216000210000183000149000119000118000129000
1935143000160000180000203000221000216000197000167000012900091200.75700.79800.
1936 9999.142000162000176000193000181000162000135000919000.87100.81900.82300.

 COMMENTS:
A = Name of river (= 40 characters)
B = Name of station (= 40 characters max.)
C = Year
D = data (January - December)

Each value = 6 characters (there maybe leading blanks!)
The values are in m3/s or l/s (see remark in the station-catalog)
Missing values =' 9999.' (see January 1936)
Each data-row = 76 characters (not including line-feed)

Example:  ' March, 1935 = 180000 m3/s
```

Table 5: File format of mean monthly data files

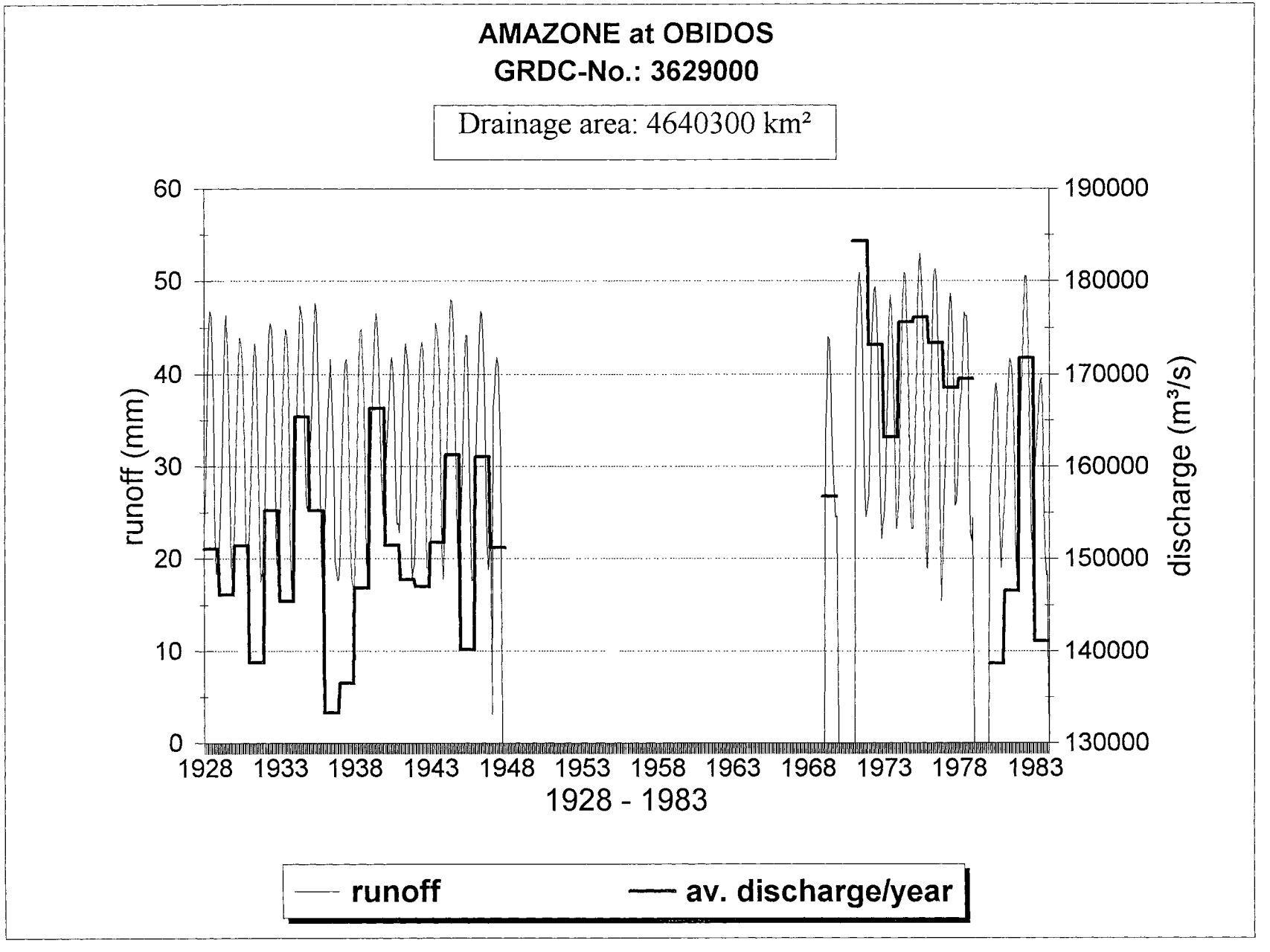
```
GLOBAL RUNOFF DATA CENTRE (GRDC)
--------------------------------

I.   Africa
01   Medjerda
1201100 Medjerda    Ghardımaou      TS 3627N   843E    1480  1 1976 12 1979 M 1
1201150 Mellegue    K13             TS 3612N   850E    9000  1 1976 12 1979 M 1
1201500 Medjerda    Sloughia        TS 3658N   952E   20895  1 1976 12 1979 M 1
02   Chott Melhir, Chott Rharsa
03   Chott Djerid
04   Mediterranean Sea Coast (Western Part)
1104150 Cheliff     Sıdi Belatar    AL 3602N   027E   43750  1 1976  8 1978 M 1
1104200 Mina        Oued El-Abtal   AL 3550N   068E    6635  1 1976  8 1978 M 1
1104500 Isser       Lakhdaria       AL 3662N   358E    4149  1 1976  8 1979 M 1
1104530 Sebaou      Baghlia         AL 3680N   387E    2501  1 1976 12 1979 M 1
1104600 Bouselam    Sidı Yahia      AL 3642N   460E    4309  1 1976  8 1978 M 1
1104700 Rhumel      Oued Athmania   AL 3623N   630E    1220  1 1976  8 1978 M 1
1104800 Melah       Bouchegouf      AL 3645N   772E     552  1 1976  8 1978 M 1
1204900 Joumine     Djebel Antra    TS 3695N   947E     235  1 1976 12 1979 M 1
1304100 Emsa        Emsa            MC 3552N   530W     110 4  1971 2  1988 D 1
1304800 Kert        Dar Driouch     MC 3490N   329W    1353 6  1969 9  1987 D 1
A       B           C               D  E       F      G       H       I       J K

COMMENT:
    A = GRDC-Code     B = Name of river     C = Name of station
    D = Code of country     E = Latitude     F = Longitude     G = Catchment area in km²
    H = first available record in database     I = last available record in database
    J = Daily/Monthly data     K = Code of measurement (1 = runoff in m3/s)

GRDC-Code (for example 1304800):
    1       = WMO-Region (1 = Africa)
     3      = GRDC-Country code (3 = Morocco)
      04    = GRDC-Subregion; main river basin (04 = Mediterranean Sea Coast)
        800= GRDC-Station code

Length of data-row, max  133 characters (incl. line-feed)
To E and F:
    To get the real values you have to divide the named value by 100. So for
    example 3627N means 36.27 degrees North.
```

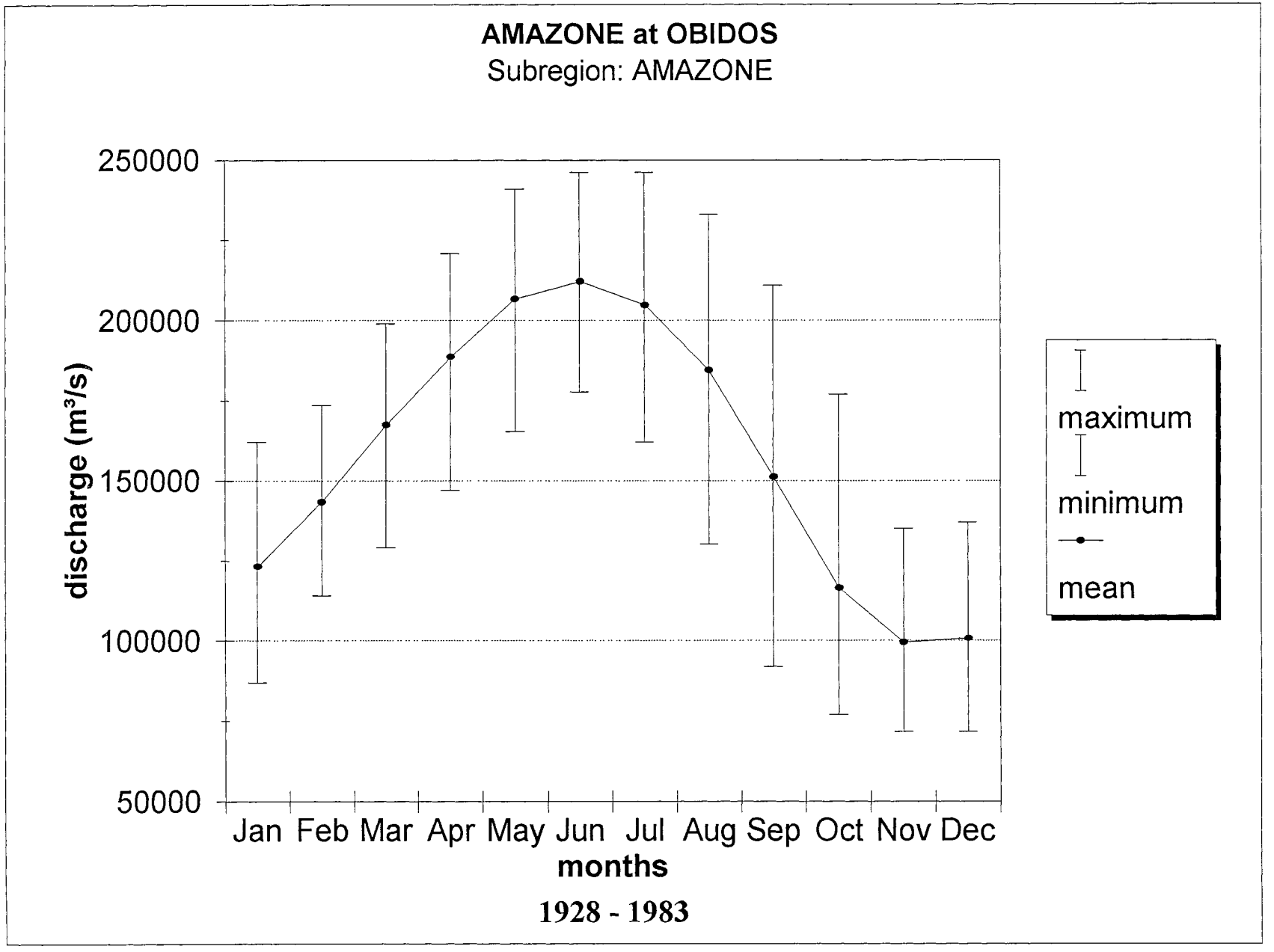
Table 6: File format of GRDC station catalog file

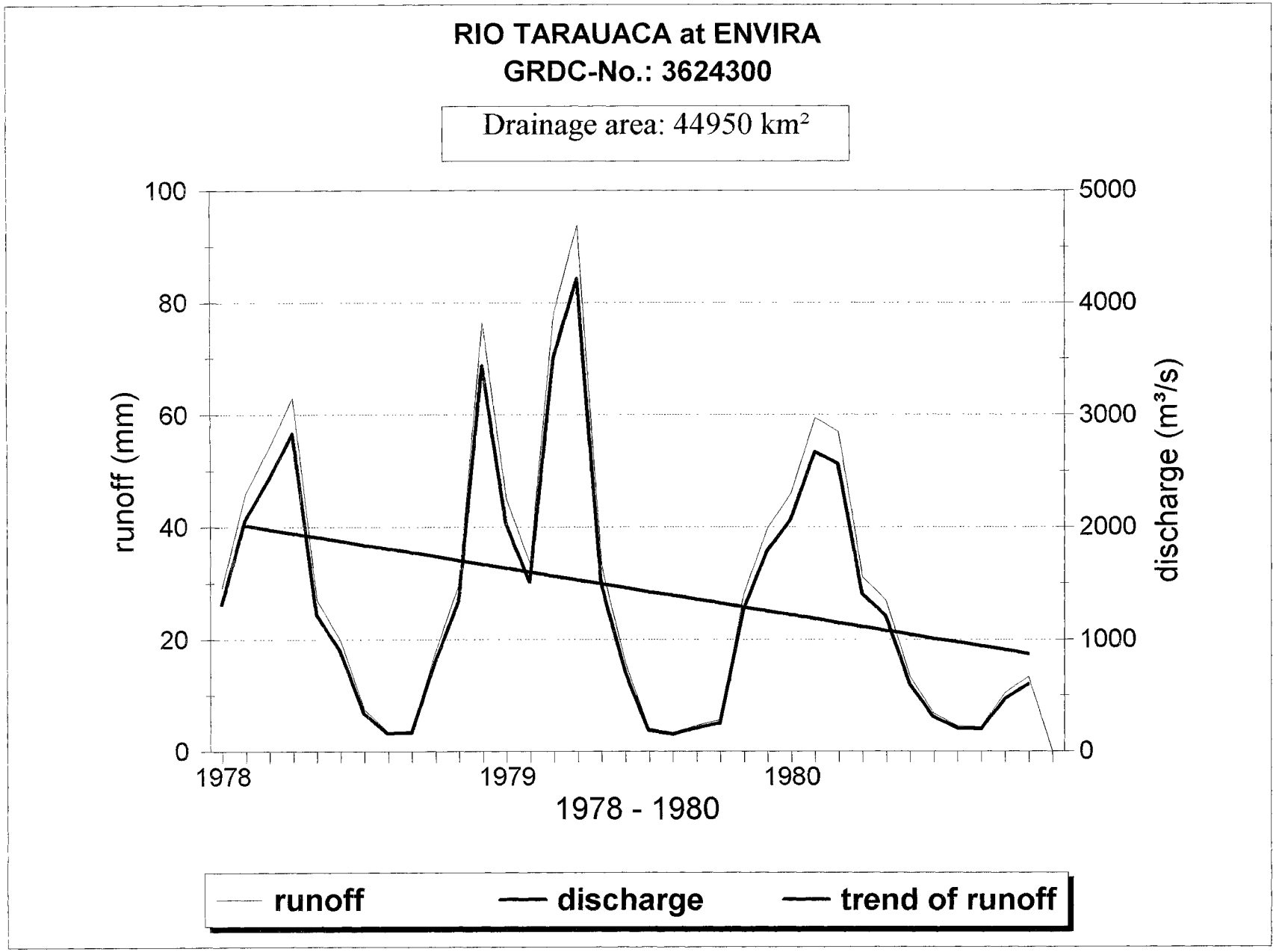

AMAZONE BASIN
GRDC - Stations
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

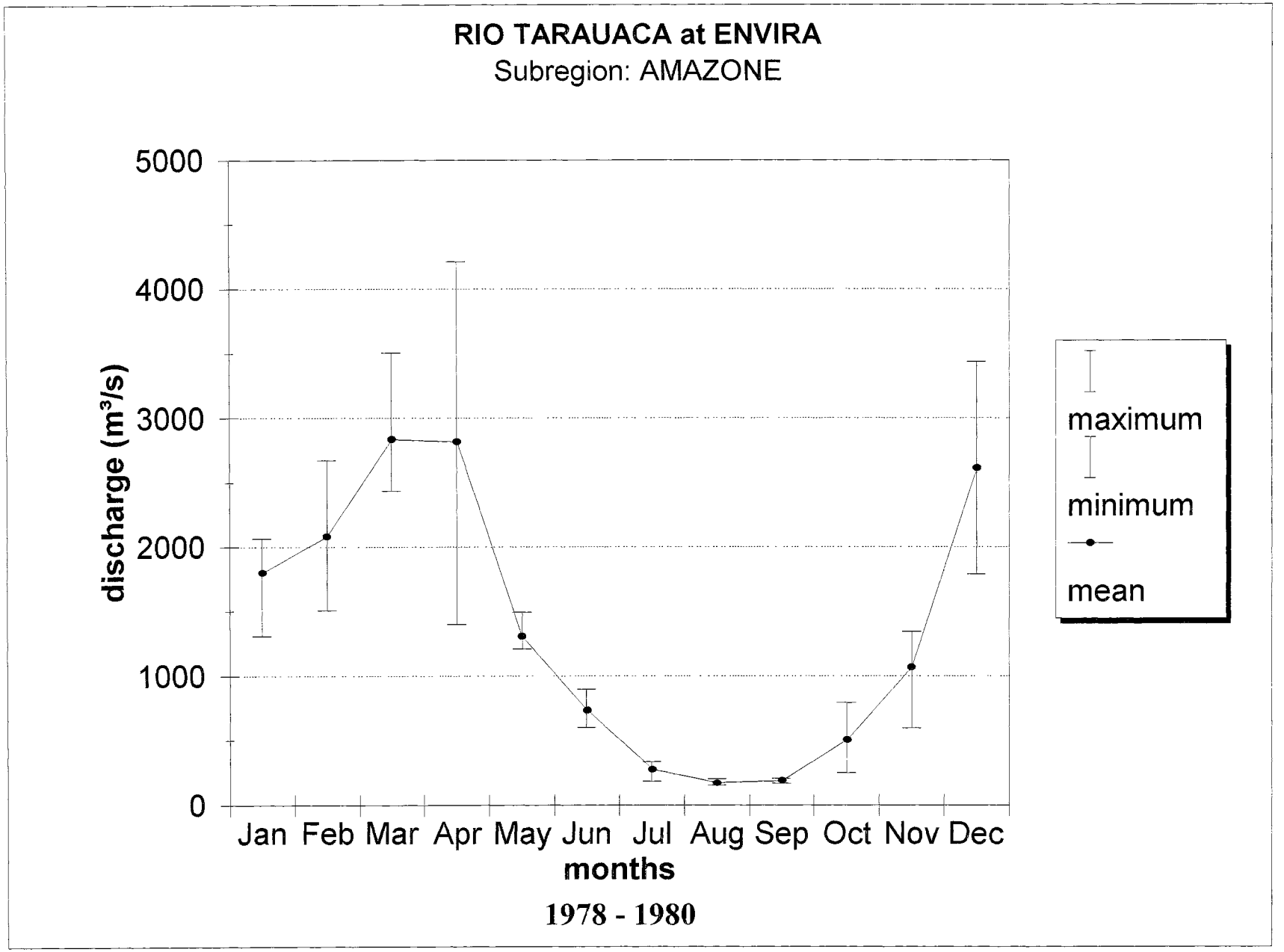
GLOBAL RUNOFF DATA CENTRE (GRDC)
20 LARGEST RIVERS

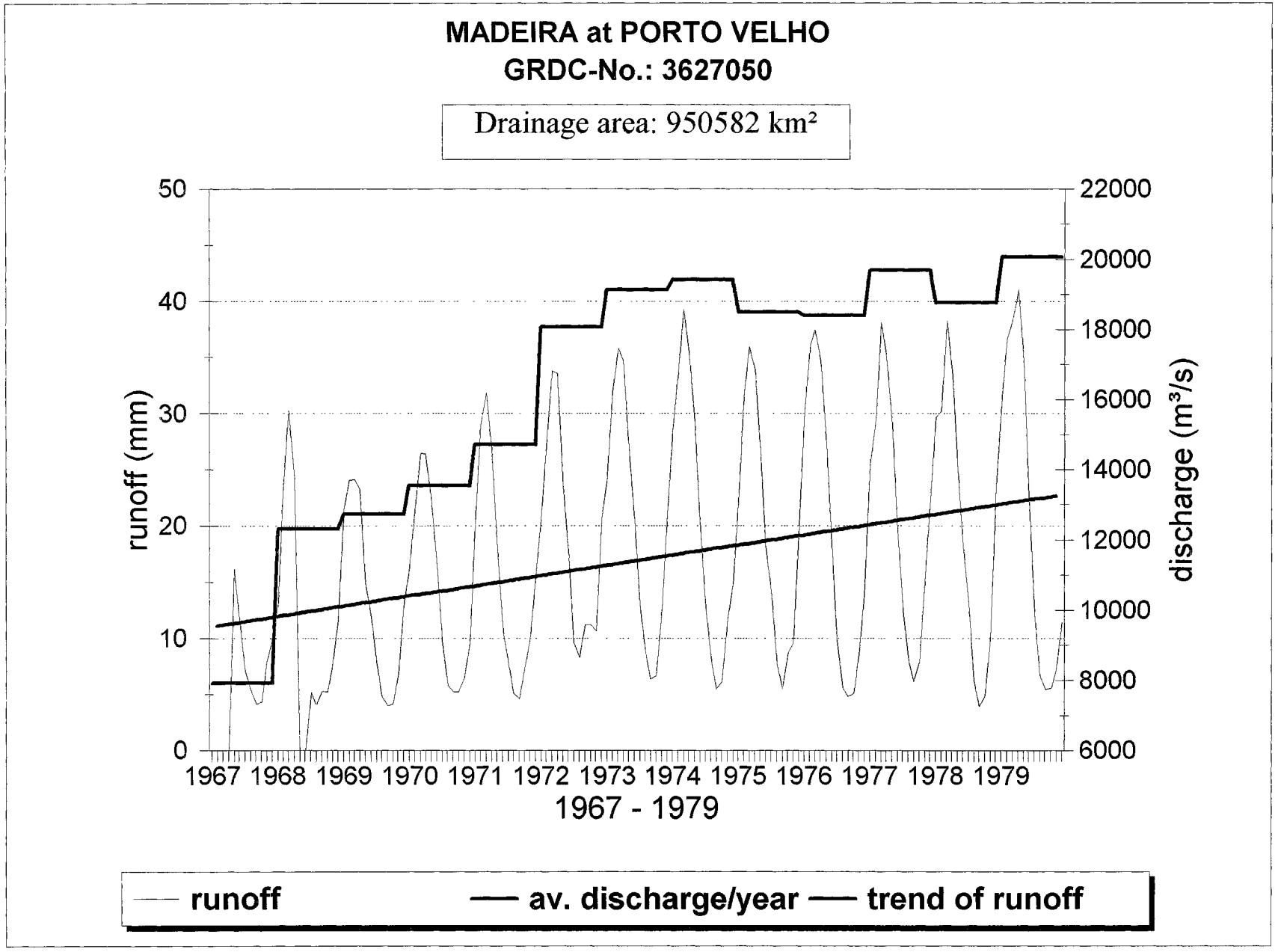
	AMAZONE							table: 1
No.	**River**	**Station**	**Area (km²)**	**Latitude**	**Longitude**	**first rec.**	**last rec.**	**day/month**
1	Rio Itacuai	Ladario	9140	473S	7030W	2 1979	12 1980	D
2	Pastaza	Banos	7694	138S	7842W	1 1979	12 1979	D
2	Pastaza	Banos	7694	138S	7842W	1 1966	12 1977	M
3	Paute	D.J.Palmira	5162	257S	7857W	1 1979	12 1979	D
3	Paute	D.J.Palmira	5162	257S	7857W	1 1976	12 1978	M
4	Rio Moa	Serra do Moa	1074	745S	7366W	1 1978	12 1980	D
5	Rio Tarauaca	Envira	44950	731S	7025W	1 1978	11 1980	D
6	Rio Mucuim	Cristo	6482	725S	6423W	1 1978	12 1978	D
7	Madeira	Porto Velho	950582	877S	6392W	5 1967	12 1979	M
8	Rio Aripuana	Humboldt	6653	1016S	5940W	5 1979	12 1980	D
9	Rio Sucunduri	Santarem	14597	675S	5893W	1 1978	12 1980	D
10	Rio Santo Antonio do Abonari	Posto Funai	2605	126S	6040W	1 1978	12 1979	D
11	**Amazone**	**Obidos**	**4640300**	**190S**	**5550W**	**1 1928**	**11 1983**	**M**
12	Rio Verde	Lucas	4116	1315S	5593W	1 1978	12 1980	D
13	Xingu	Altamira	446570	320S	5222W	1 1976	12 1979	M
14	Rio Ronuro	Fazenda Itaguacu	3550	1315S	5448W	1 1978	3 1979	D
15	Rio Culuene	Passagem Da Br-309	1317	1465S	5386W	1 1978	1 1979	D

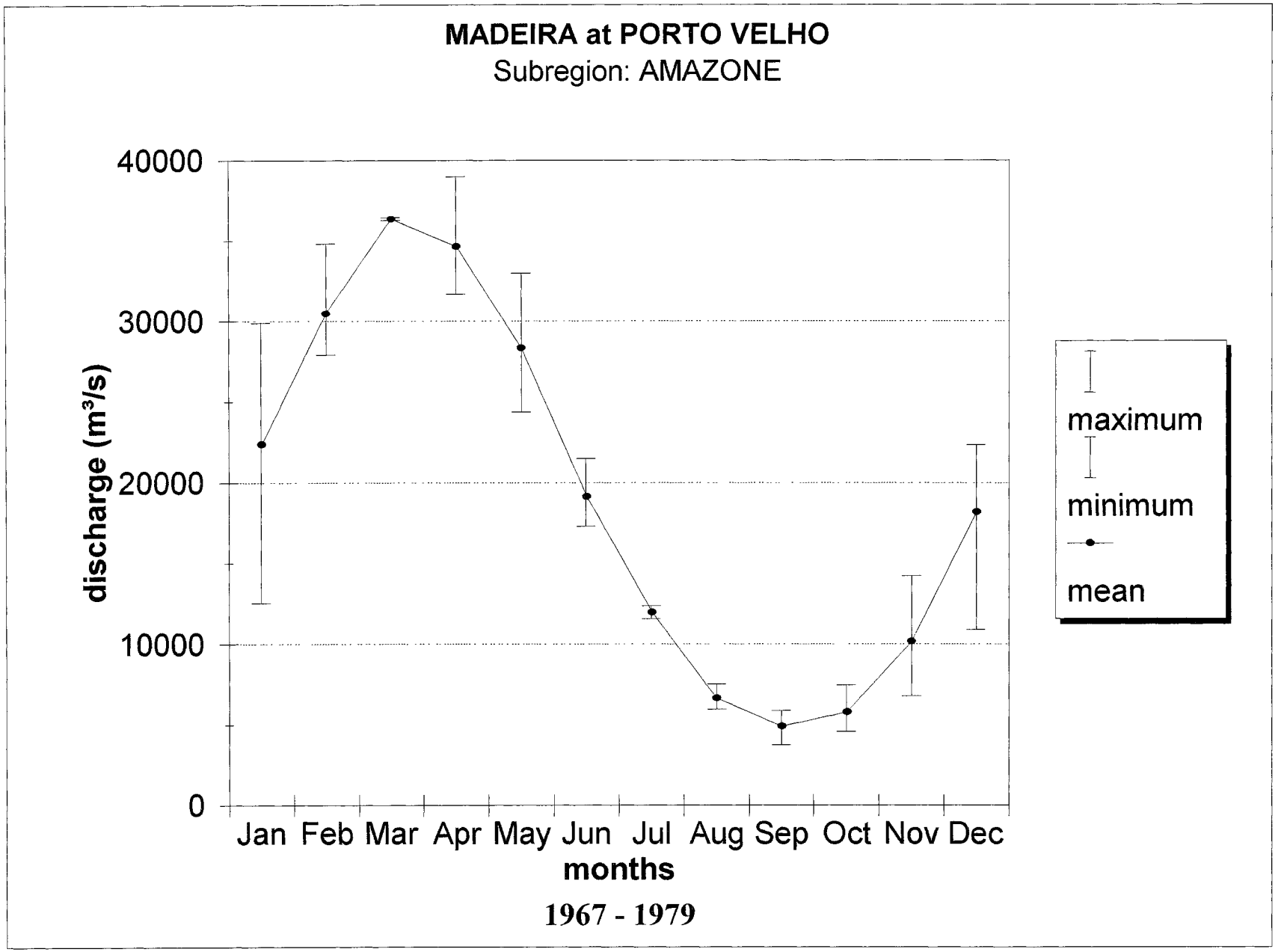

AMAZONE at OBIDOS
GRDC-No.: 3629000
Drainage area: 4640300 km²
runoff (mm)
discharge (m³/s)
60
50
40
30
20
10
0
190000
180000
170000
160000
150000
140000
130000
1928 1933 1938 1943 1948 1953 1958 1963 1968 1973 1978 1983
1928 - 1983
runoff
av. discharge/year

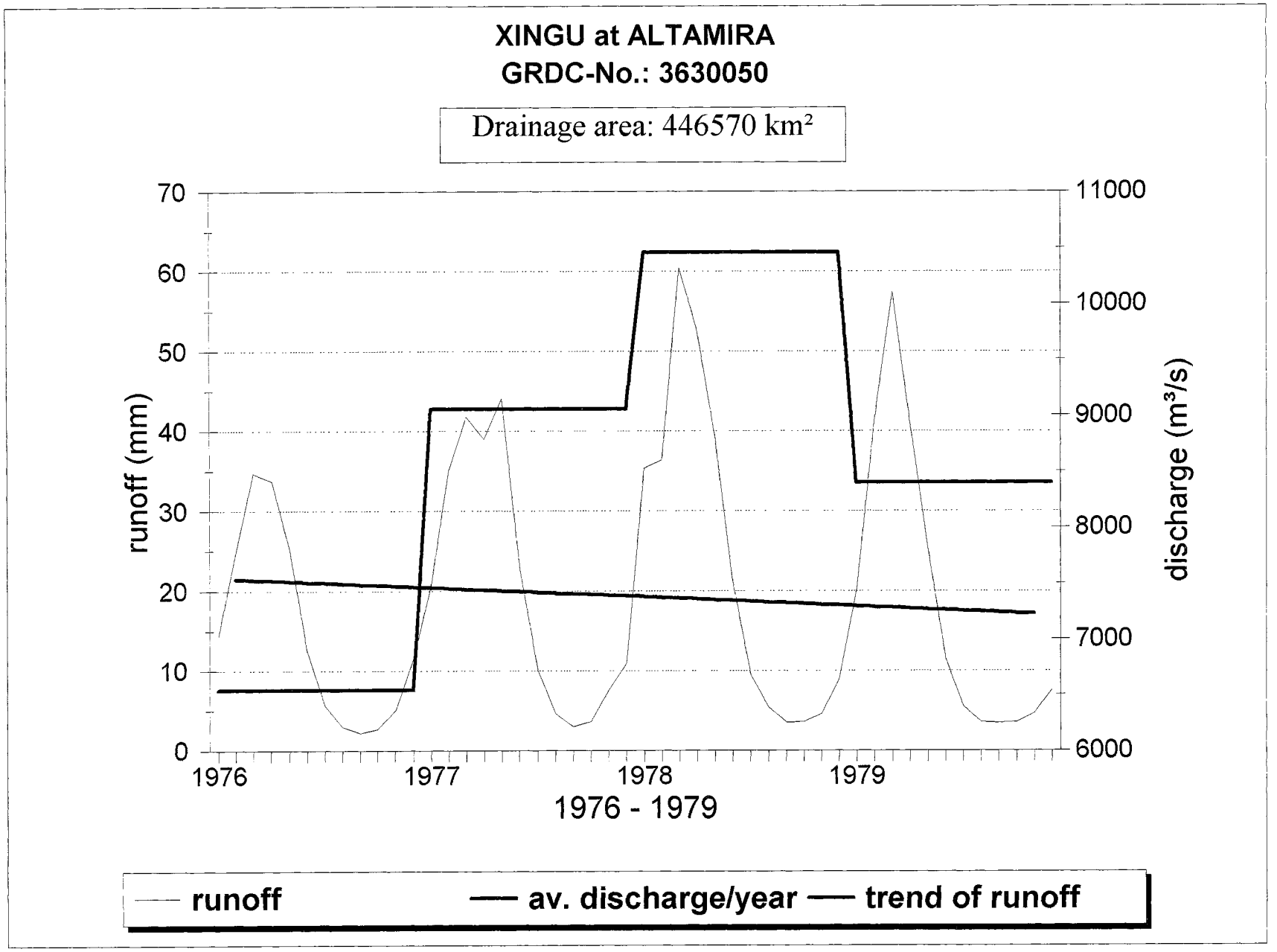

AMAZONE at OBIDOS
Subregion: AMAZONE
250000
200000
150000
100000
50000
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
maximum
minimum
mean
1928 - 1983

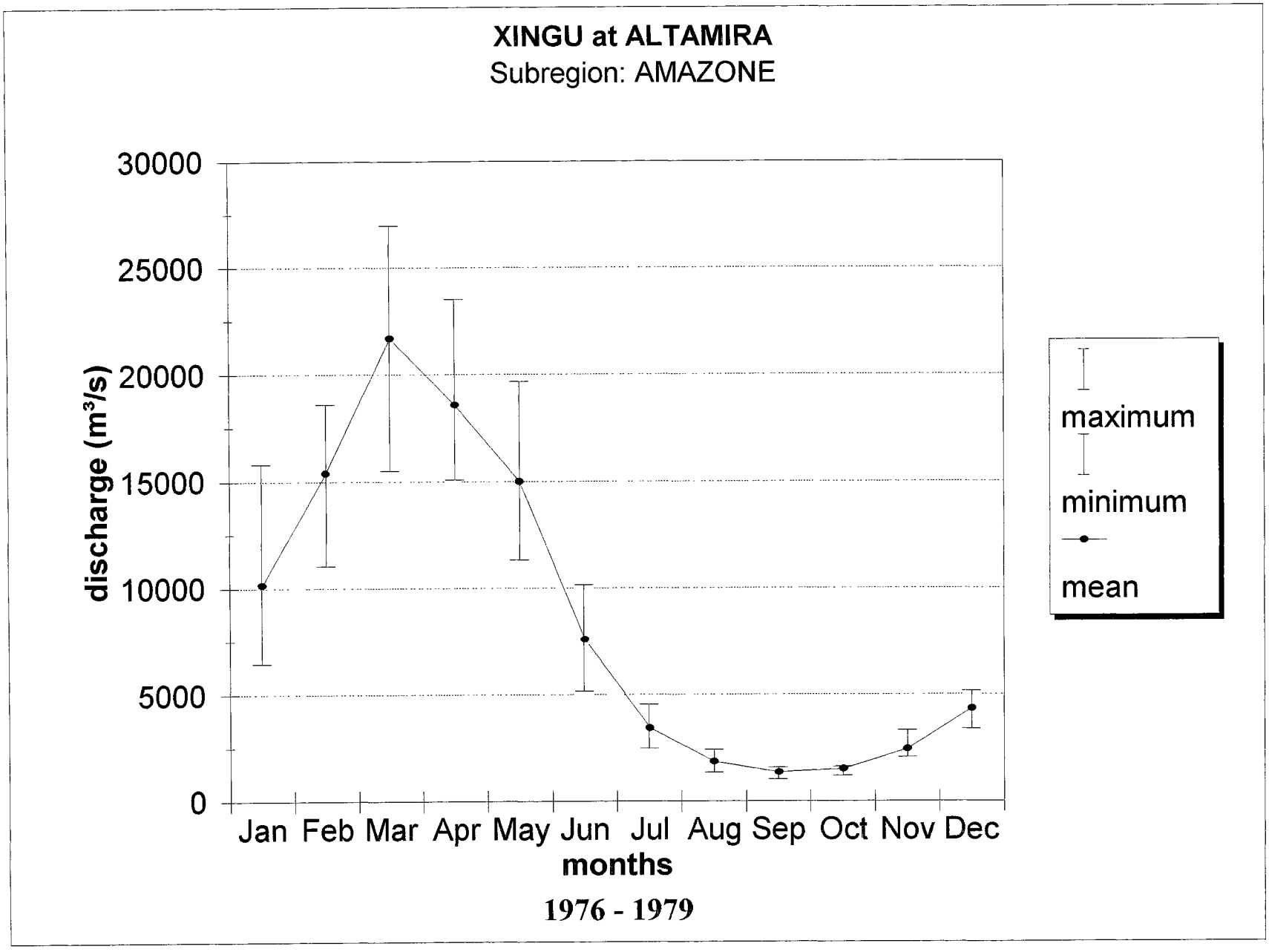

RIO TARAUACA at ENVIRA
GRDC-No.: 3624300
Drainage area: 44950 km²
runoff (mm)
discharge (m³/s)
100
80
60
40
20
0
5000
4000
3000
2000
1000
0
1978
1979
1980
1978 - 1980
runoff
discharge
trend of runoff

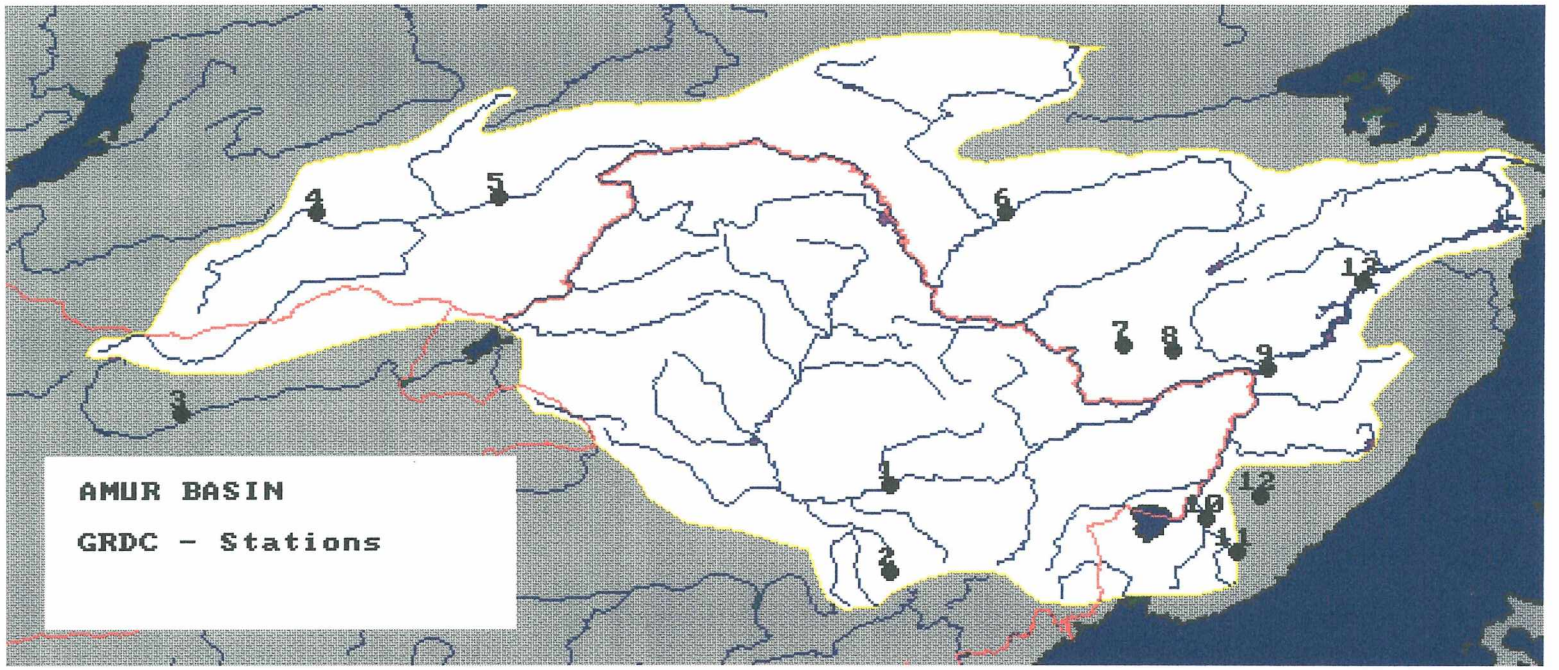

RIO TARAUACA at ENVIRA
Subregion: AMAZONE
5000
4000
3000
2000
1000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1978 - 1980
maximum
minimum
mean


MADEIRA at PORTO VELHO
GRDC-No.: 3627050
Drainage area: 950582 km²
runoff (mm)
discharge (m³/s)
0
10
20
30
40
50
6000
8000
10000
12000
14000
16000
18000
20000
22000
1967 1968 1969 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
1967 - 1979
runoff
av. discharge/year
trend of runoff


MADEIRA at PORTO VELHO
Subregion: AMAZONE
40000
30000
20000
10000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1967 - 1979
maximum
minimum
mean

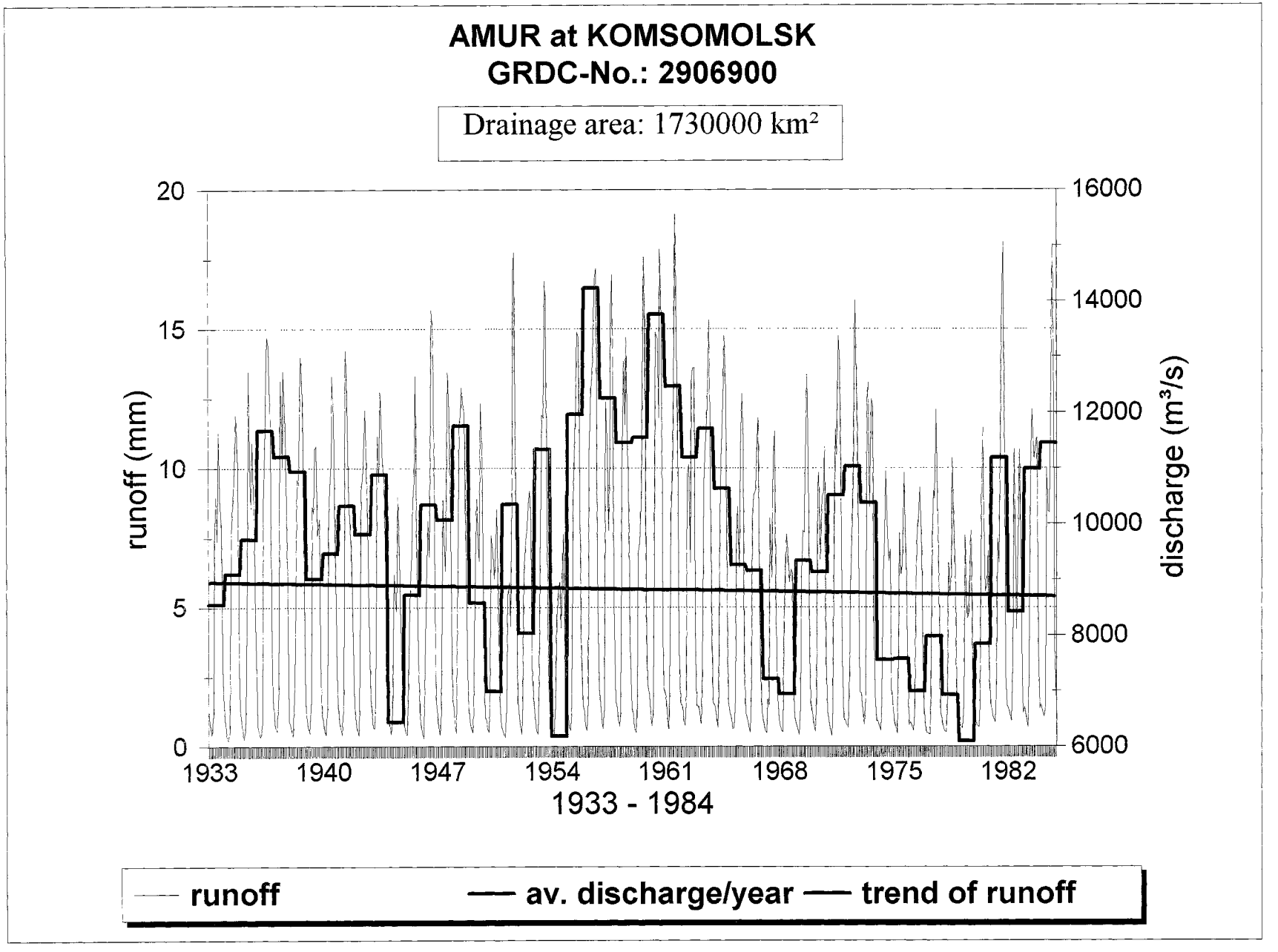

XINGU at ALTAMIRA
GRDC-No.: 3630050
Drainage area: 446570 km²
runoff (mm)
discharge (m³/s)
70
60
50
40
30
20
10
0
11000
10000
9000
8000
7000
6000
1976
1977
1978
1979
1976 - 1979
runoff
av. discharge/year
trend of runoff

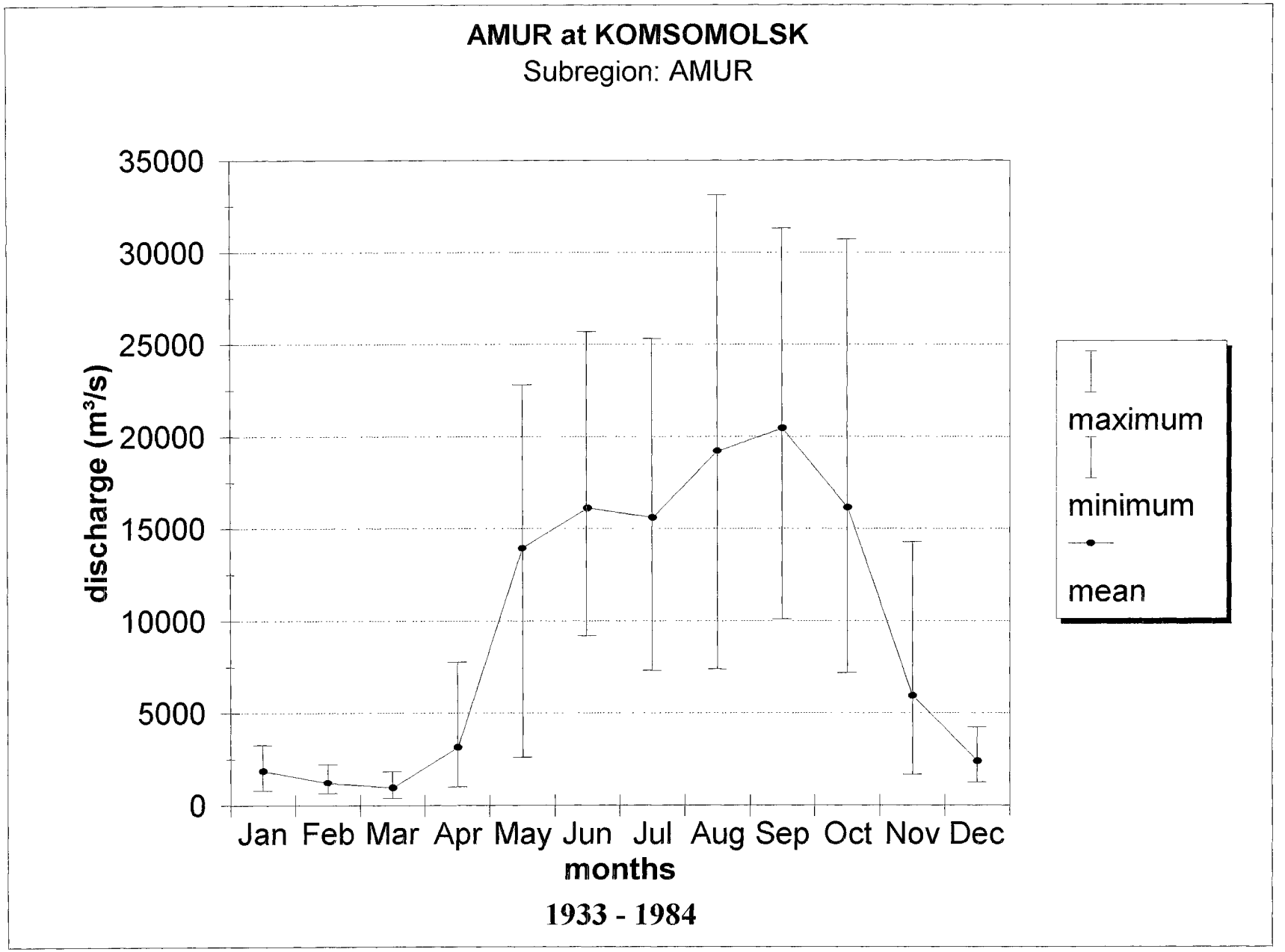

XINGU at ALTAMIRA
Subregion: AMAZONE
30000
25000
20000
15000
10000
5000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
maximum
minimum
mean
1976 - 1979

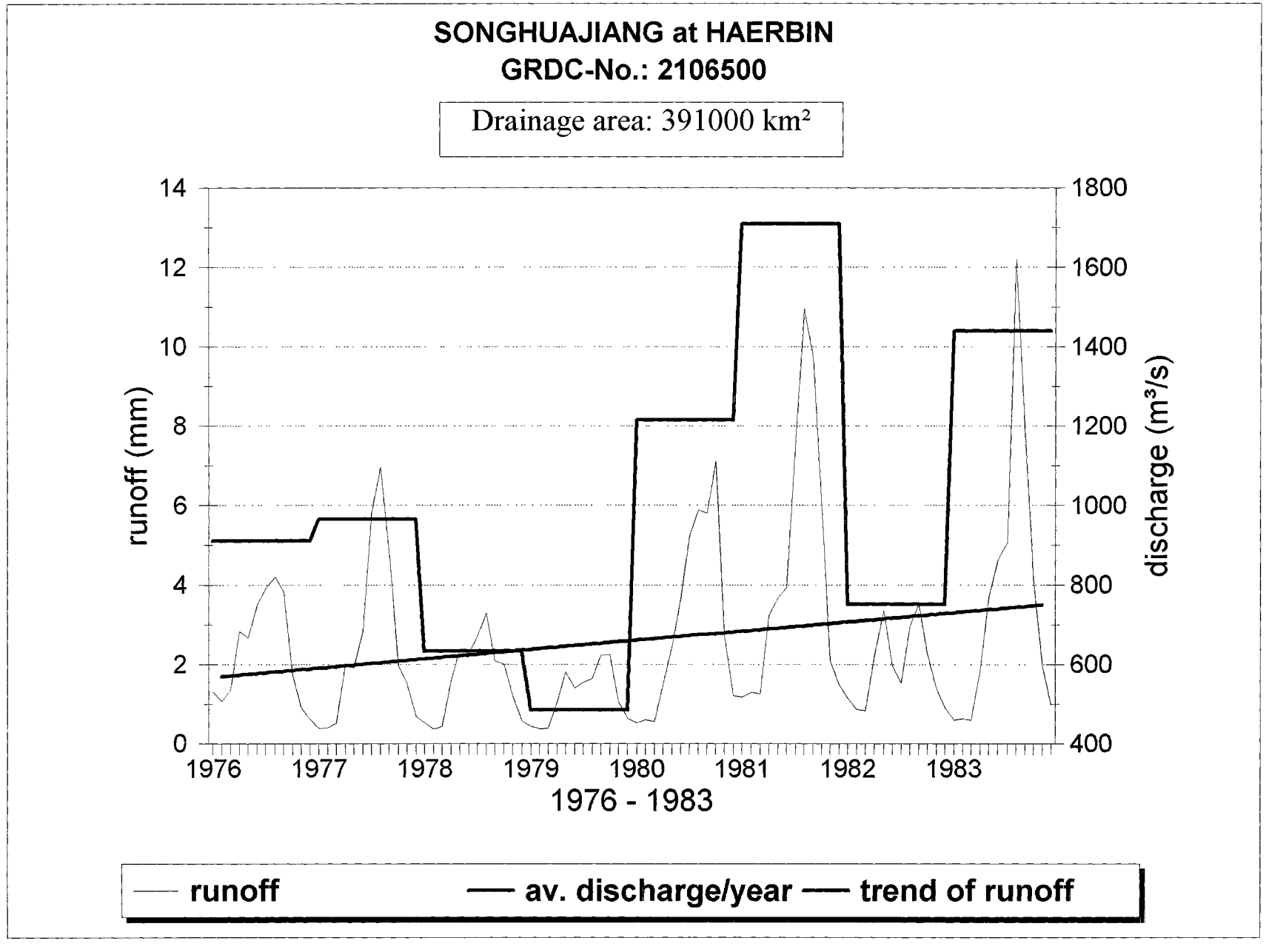

AMUR BASIN
GRDC - Stations
1
2
3
4
5
6
7
8
9
10
11
12
13

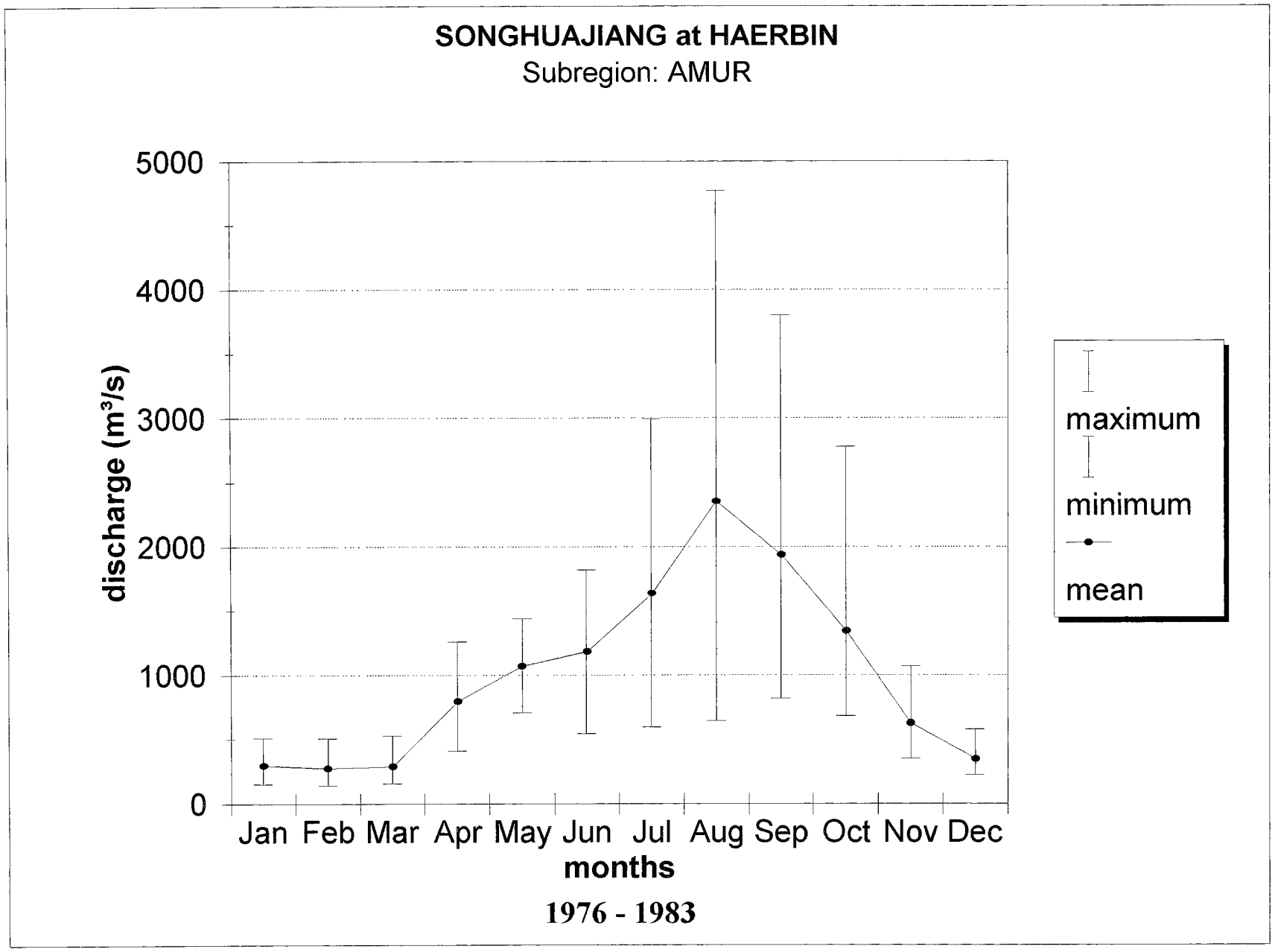
GLOBAL RUNOFF DATA CENTRE (GRDC)
20 LARGEST RIVERS

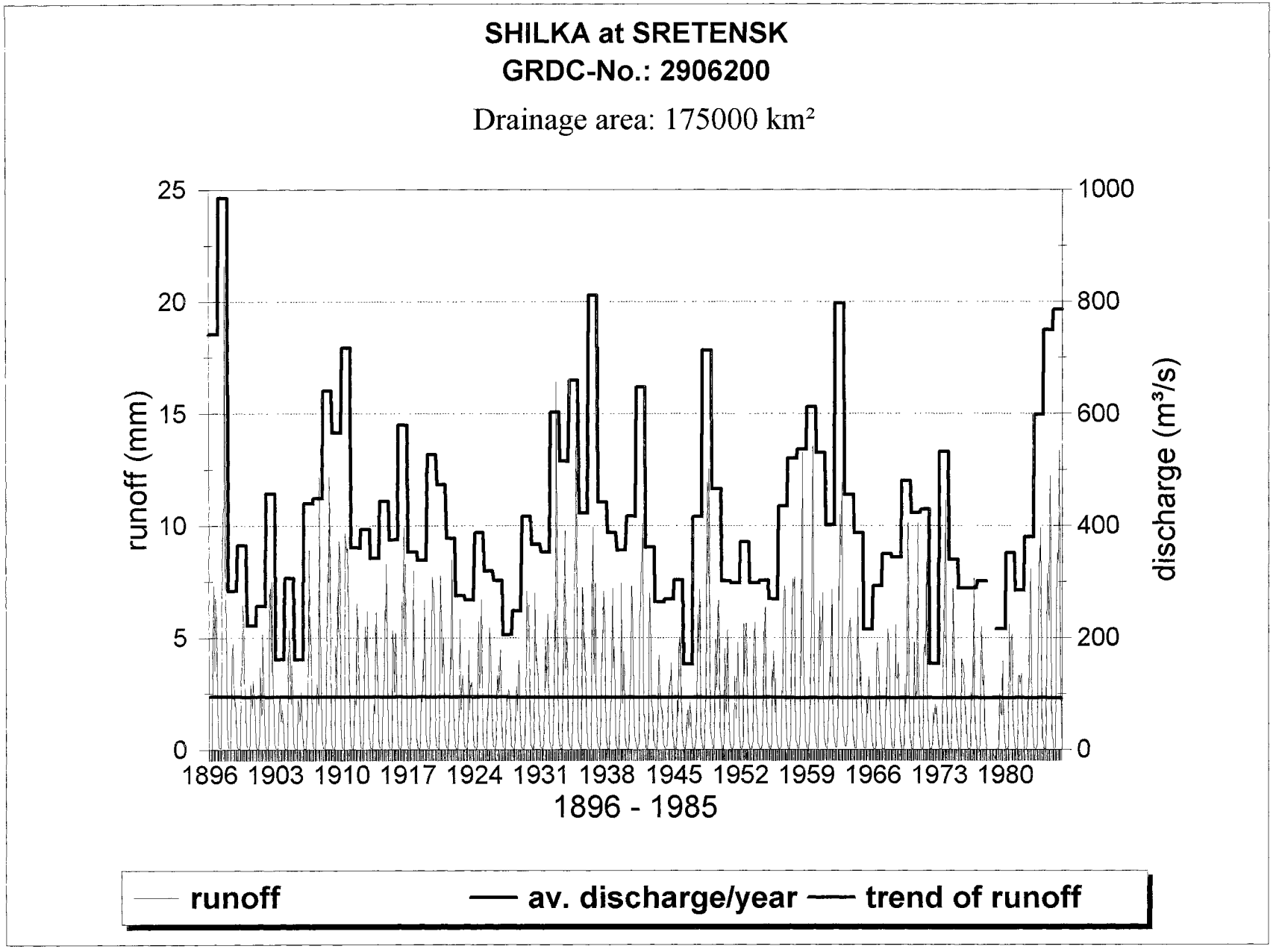
	AMUR							
No.	River	Station	Area (km²)	Latitude	Longitude	first rec.	last rec.	day/month
1	Songhuajiang	Haerbin	391000	4577N	12658E	1 1976	12 1983	M
2	Songhuajiang	Jilin	44100	4388N	12653E	1 1980	12 1983	M
3	Kerulen	Undurkham	39400	4732N	11067E	1 1976	12 1984	M
4	Nikishikha	Atamanovka	575	5193N	11368E	1 1978	12 1987	D
5	Shilka	Sretensk	175000	5225N	11772E	5 1896	12 1985	M
6	Selemdhza	Ust-Ulma	67000	5195N	12912E	1 1965	12 1984	M
7	Bolshaya Bira	Birakan	2910	4893N	13180E	1 1978	12 1987	D
8	Ikura	Birobidzhan	155	4881N	13289E	1 1978	12 1987	D
9	Amur	Khabarovsk	1630000	4843N	13505E	5 1896	12 1985	M
10	Ussuri	Kirovsky	24400	4502N	13365E	1 1965	12 1984	M
11	Pavlovka	Uborka	3350	4431N	13426E	1 1978	12 1987	D
12	Malinovka	Rakitnoe	4730	4556N	13481E	1 1978	12 1987	D
13	**Amur**	**Komsomolsk**	**1730000**	**5063N**	**13712E**	**1 1933**	**12 1984**	M

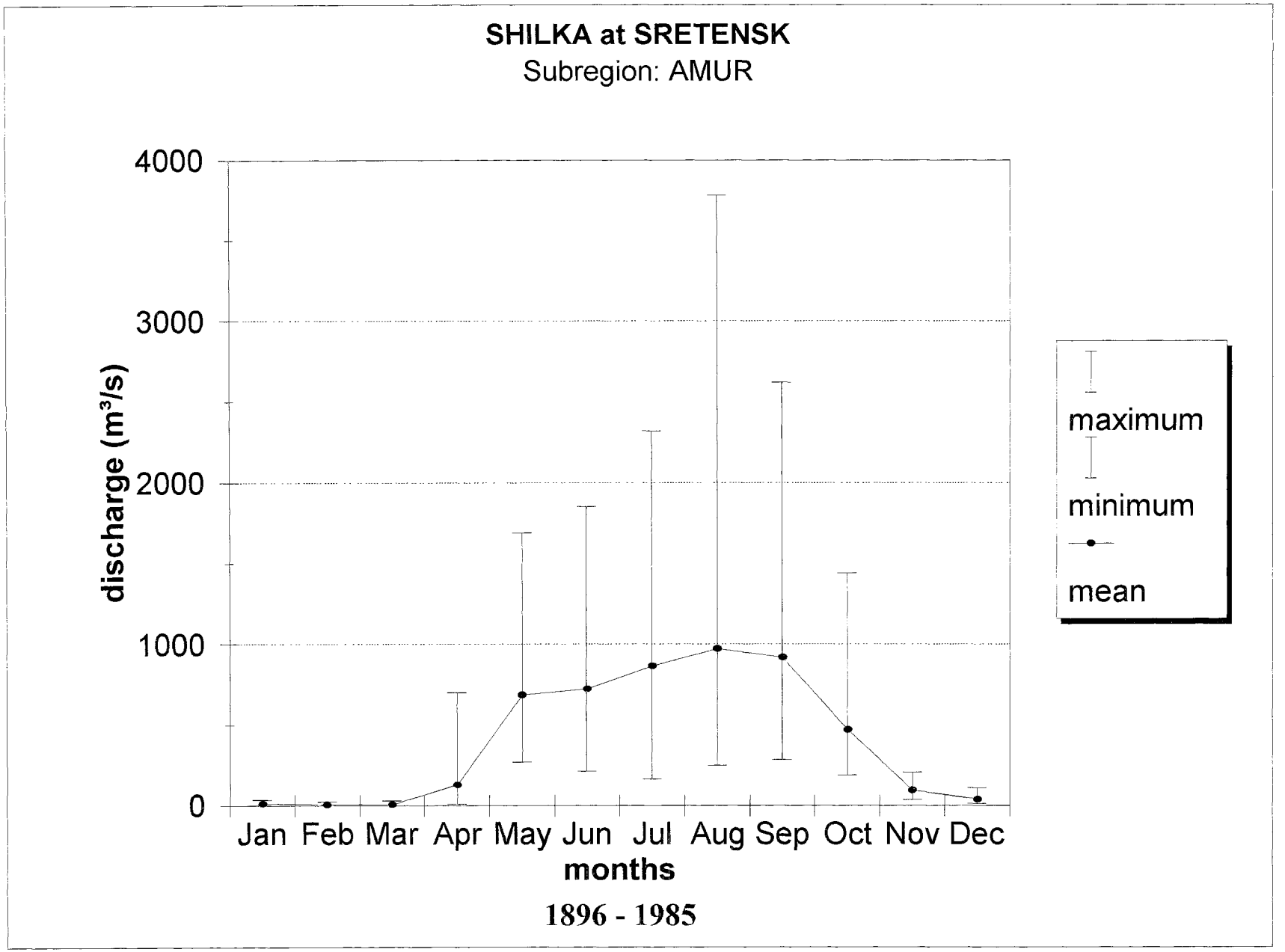

AMUR at KOMSOMOLSK
GRDC-No.: 2906900
Drainage area: 1730000 km²
runoff (mm)
discharge (m³/s)
20
15
10
5
0
16000
14000
12000
10000
8000
6000
1933
1940
1947
1954
1961
1968
1975
1982
1933 - 1984
runoff
av. discharge/year
trend of runoff

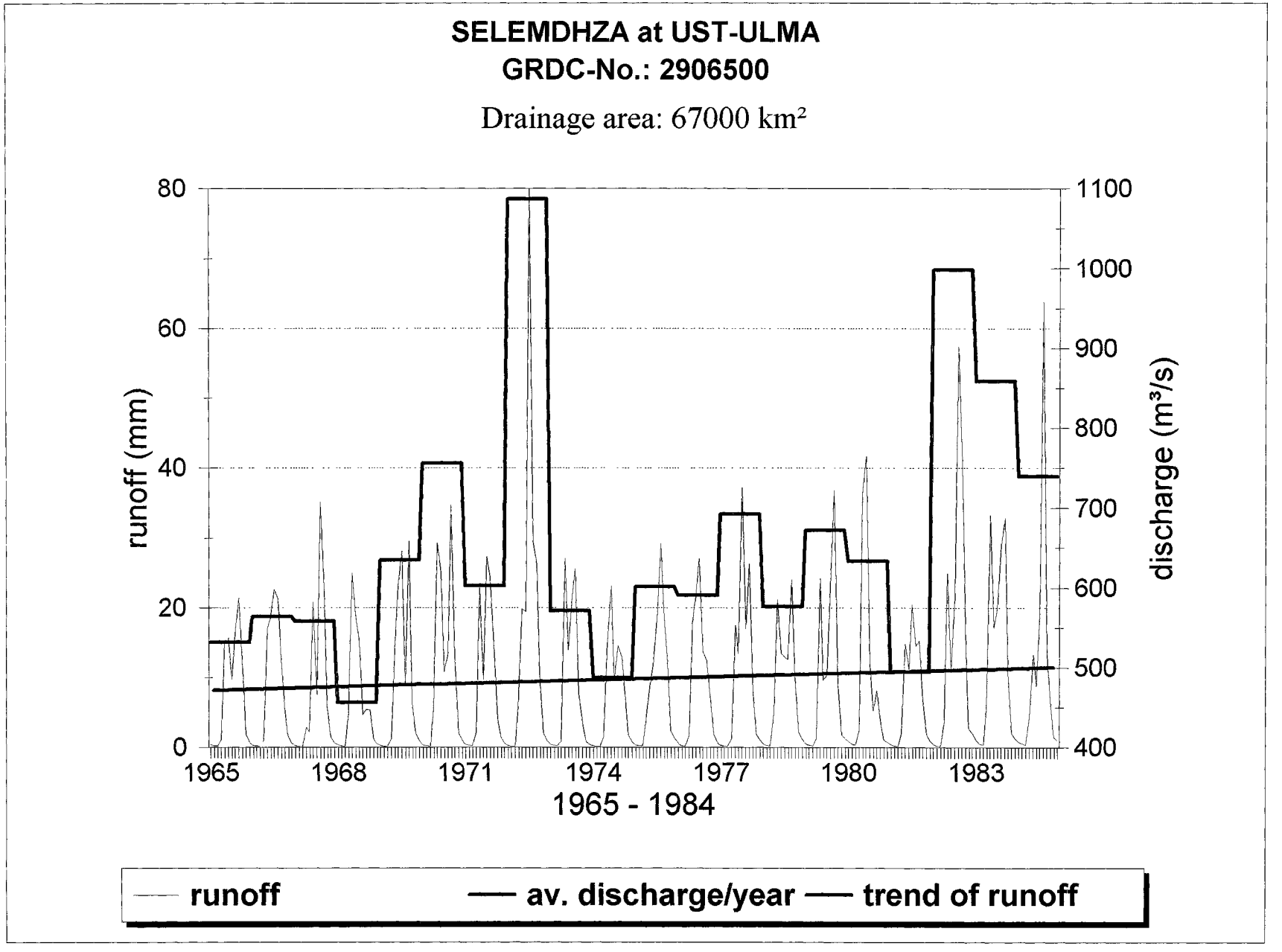

AMUR at KOMSOMOLSK
Subregion: AMUR
35000
30000
25000
20000
15000
10000
5000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1933 - 1984
maximum
minimum
mean

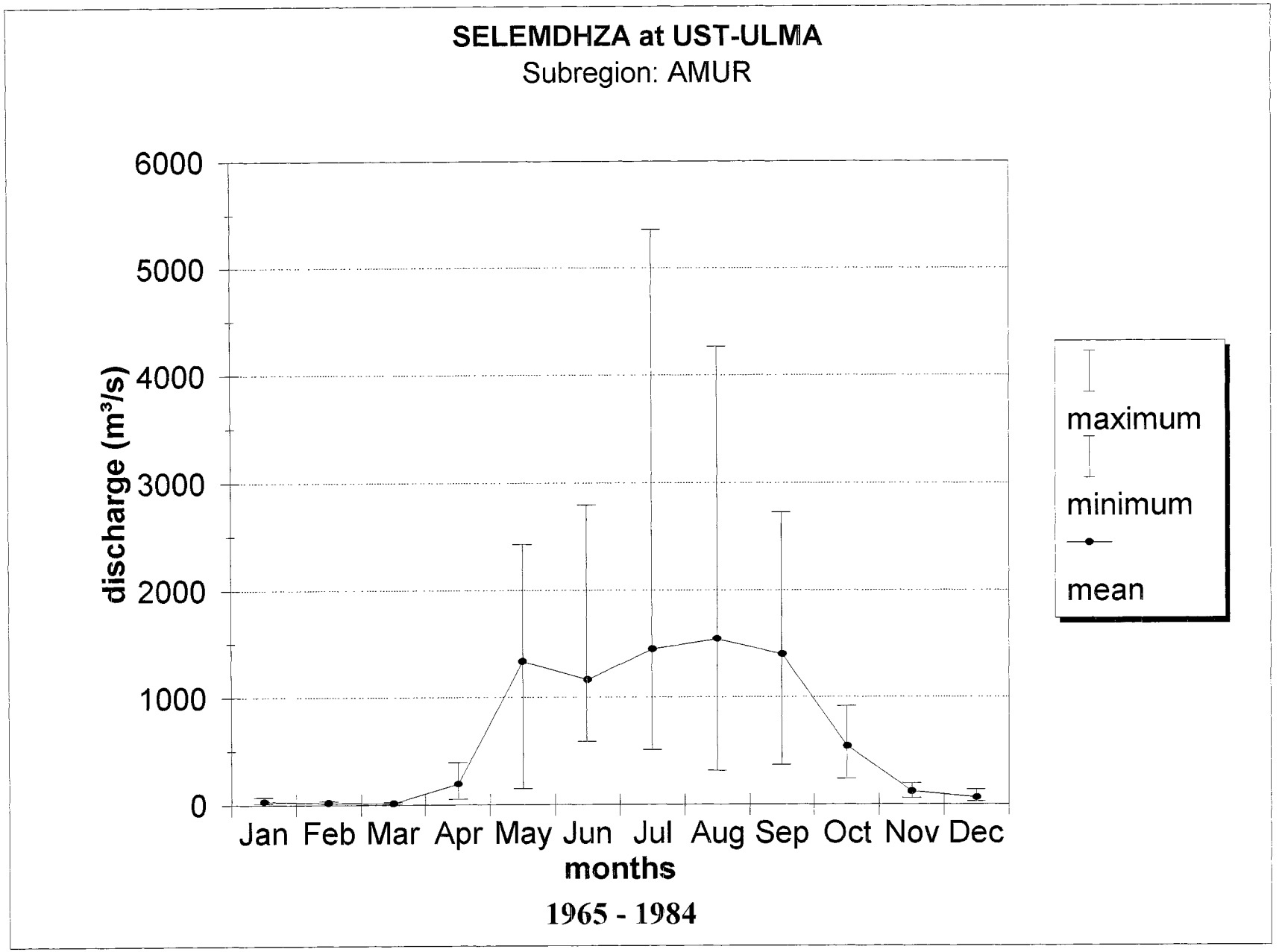

SONGHUAJIANG at HAERBIN
GRDC-No.: 2106500
Drainage area: 391000 km²
runoff (mm)
discharge (m³/s)
0
2
4
6
8
10
12
14
400
600
800
1000
1200
1400
1600
1800
1976
1977
1978
1979
1980
1981
1982
1983
1976 - 1983
runoff
av. discharge/year
trend of runoff

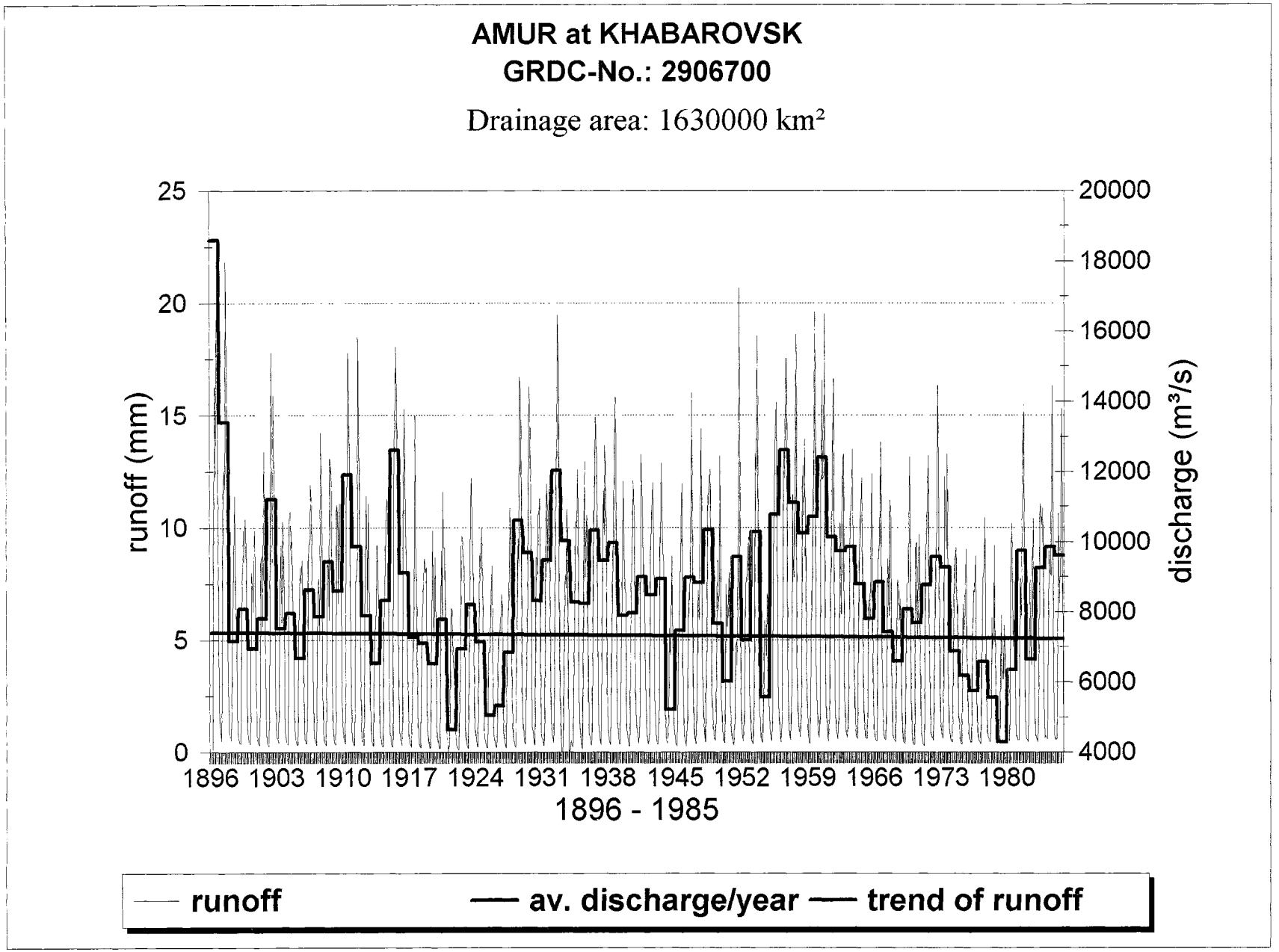

SONGHUAJIANG at HAERBIN
Subregion: AMUR
5000
4000
3000
2000
1000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
maximum
minimum
mean
1976 - 1983

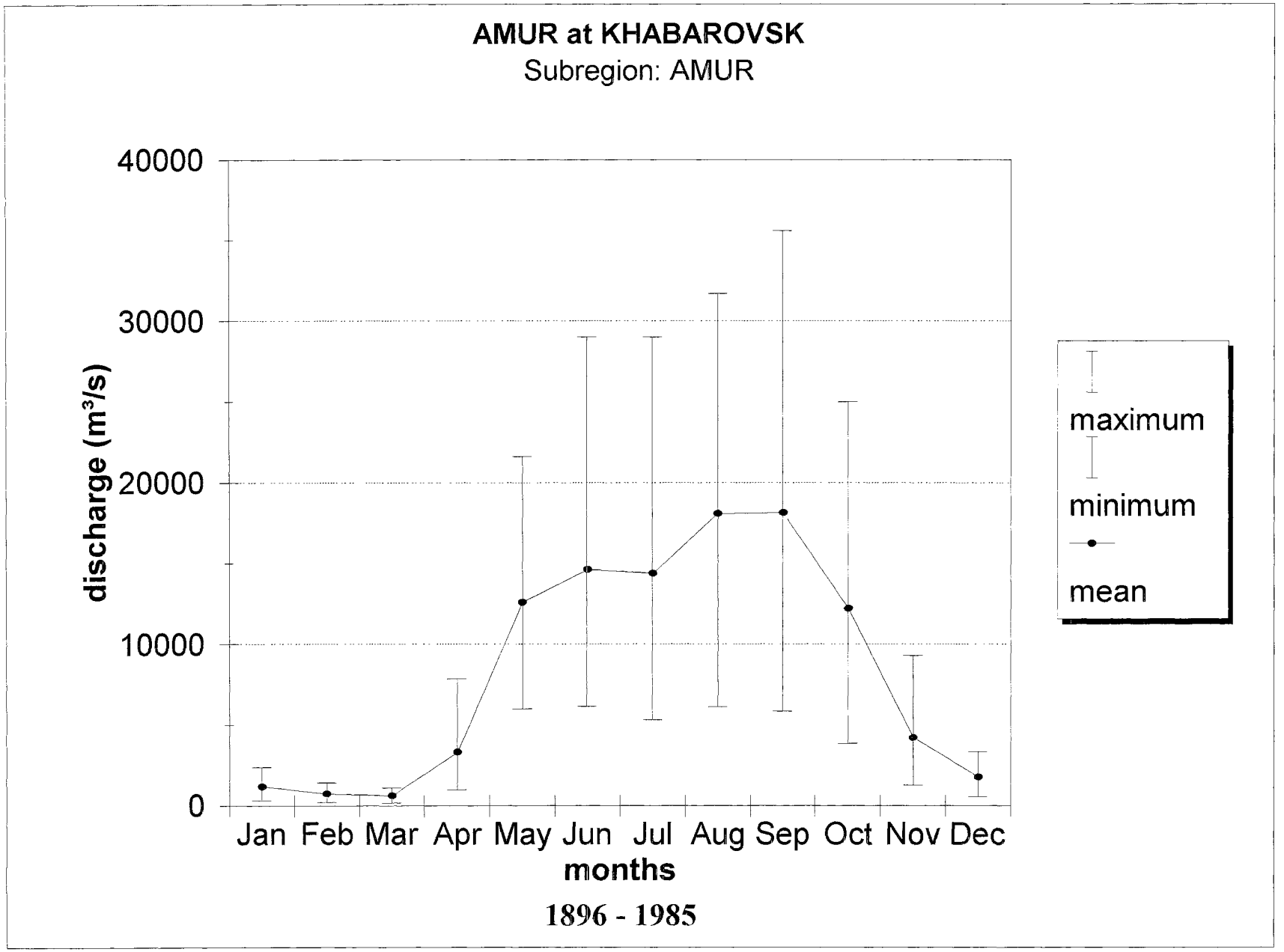

SHILKA at SRETENSK
GRDC-No.: 2906200
Drainage area: 175000 km²
runoff (mm)
discharge (m³/s)
0
5
10
15
20
25
0
200
400
600
800
1000
1896 1903 1910 1917 1924 1931 1938 1945 1952 1959 1966 1973 1980
1896 - 1985
runoff
av. discharge/year
trend of runoff

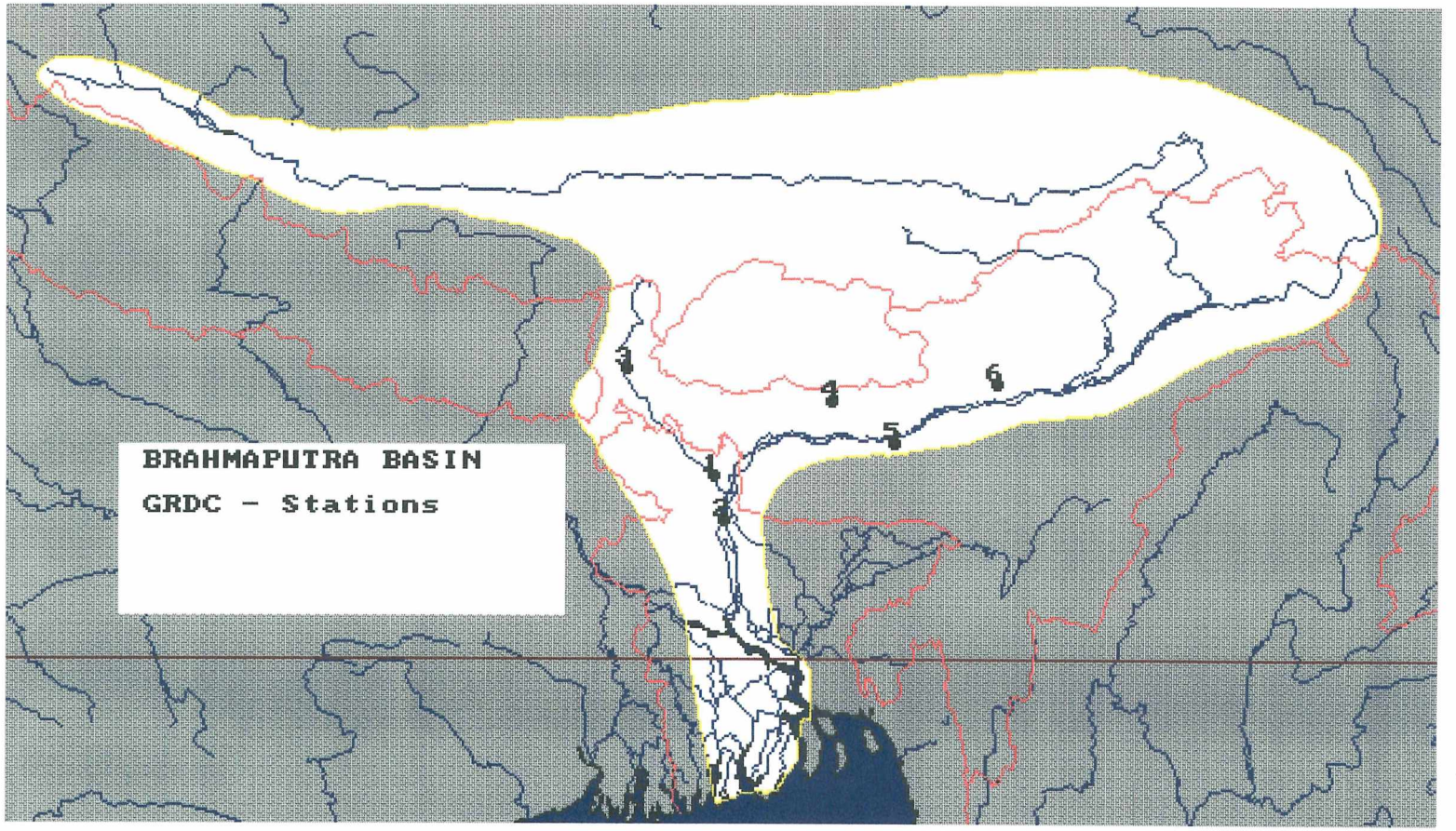

SHILKA at SRETENSK
Subregion: AMUR
4000
3000
2000
1000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
maximum
minimum
mean
1896 - 1985


SELEMDHZA at UST-ULMA
GRDC-No.: 2906500
Drainage area: 67000 km²
runoff (mm)
discharge (m³/s)
0
20
40
60
80
400
500
600
700
800
900
1000
1100
1965
1968
1971
1974
1977
1980
1983
1965 - 1984
runoff
av. discharge/year
trend of runoff


SELEMDHZA at UST-ULMA
Subregion: AMUR
6000
5000
4000
3000
2000
1000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1965 - 1984
maximum
minimum
mean

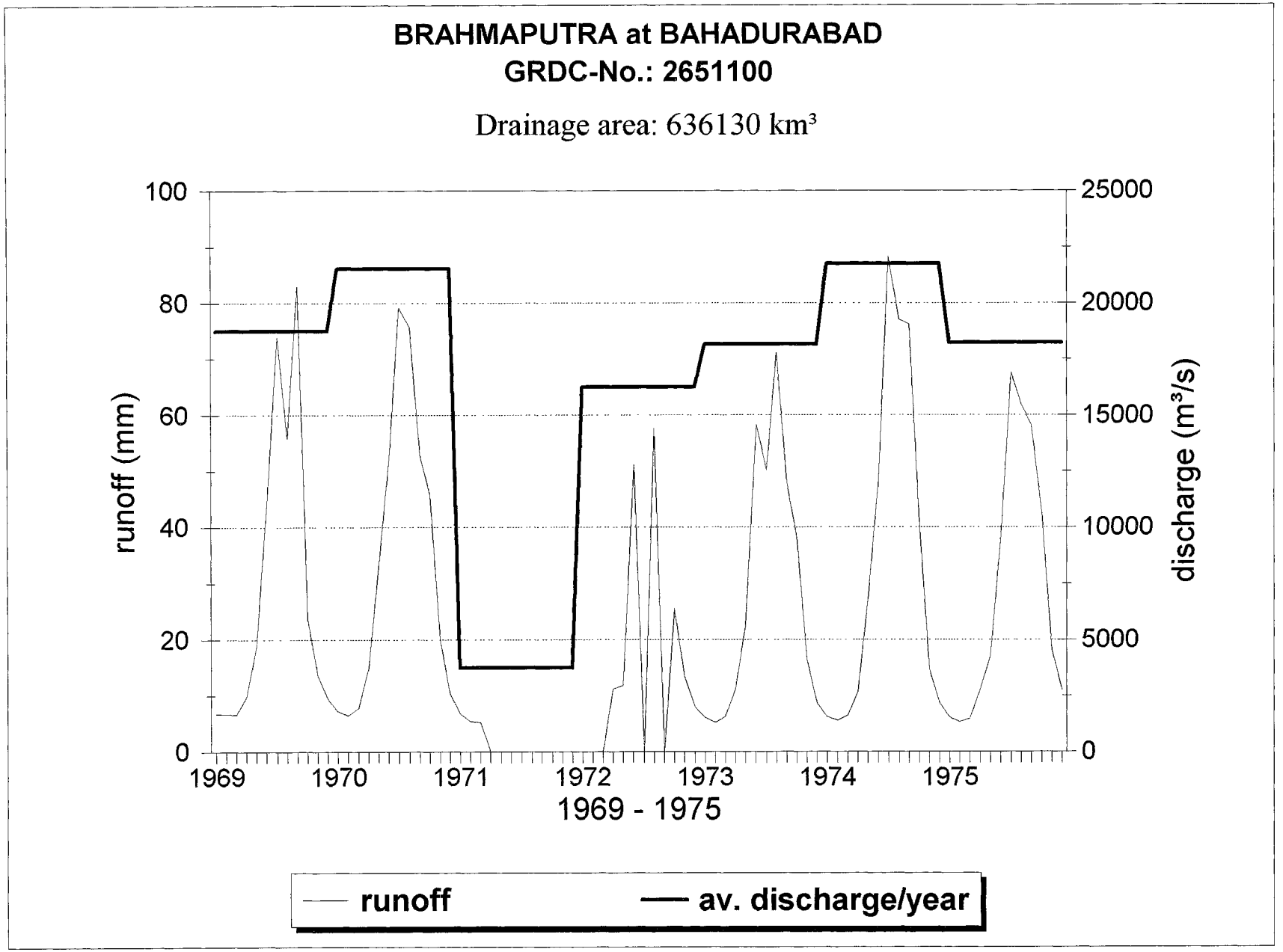

AMUR at KHABAROVSK
GRDC-No.: 2906700
Drainage area: 1630000 km²
runoff (mm)
discharge (m³/s)
25
20
15
10
5
0
20000
18000
16000
14000
12000
10000
8000
6000
4000
1896 1903 1910 1917 1924 1931 1938 1945 1952 1959 1966 1973 1980
1896 - 1985
runoff
av. discharge/year
trend of runoff

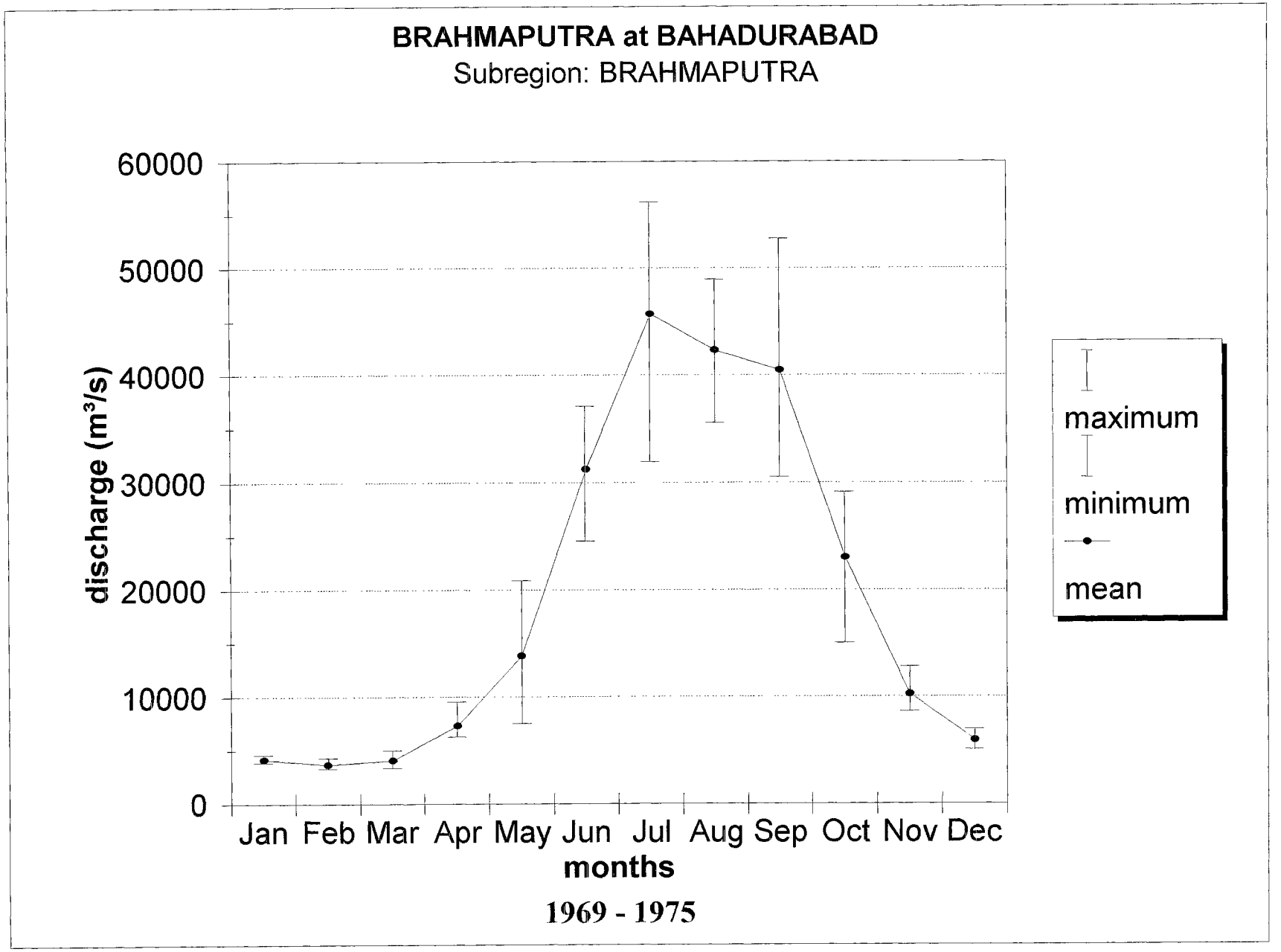

AMUR at KHABAROVSK
Subregion: AMUR
40000
30000
20000
10000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
maximum
minimum
mean
1896 - 1985

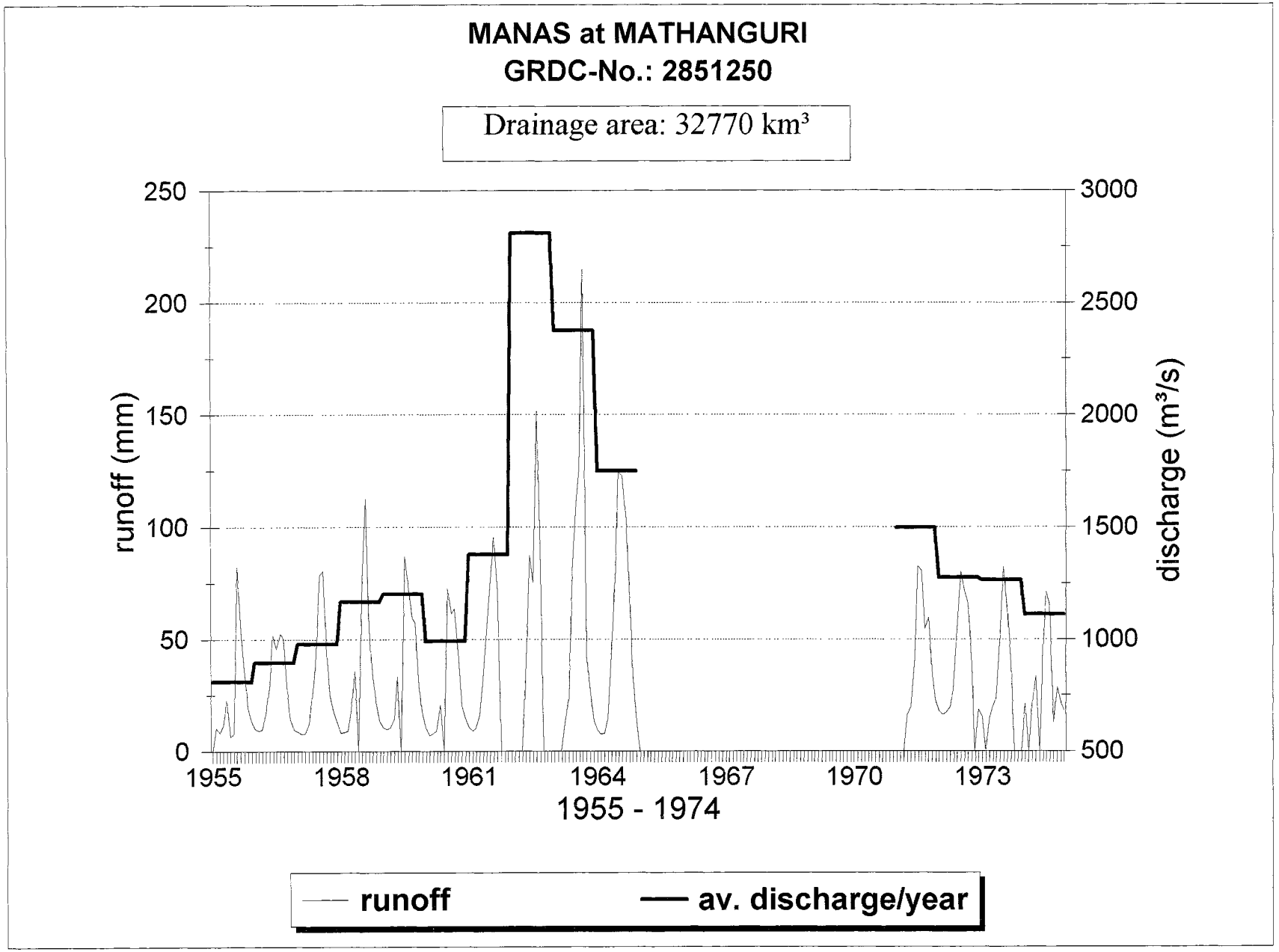

BRAHMAPUTRA BASIN
GRDC - Stations
1
2
3
4
5
6

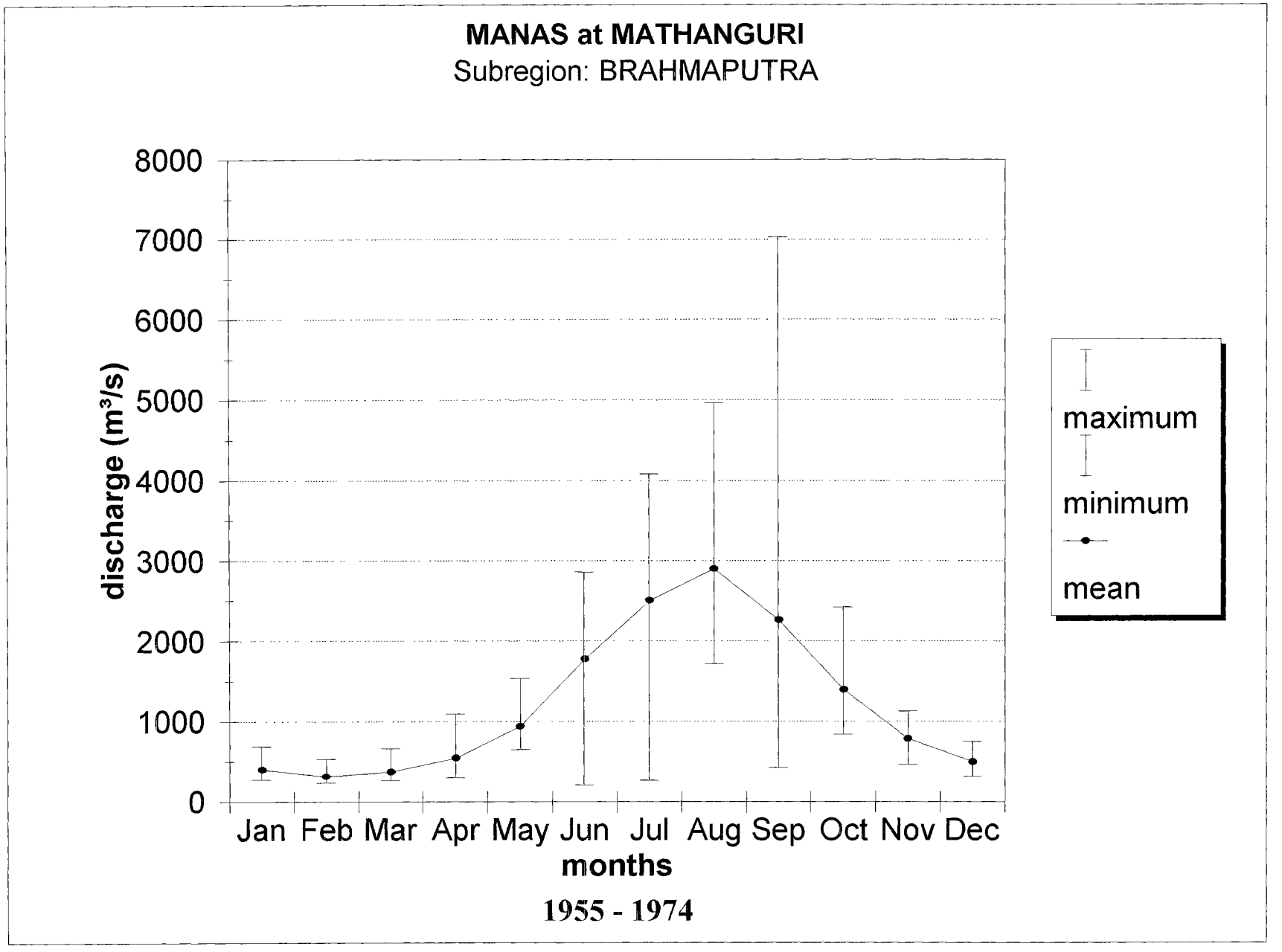
GLOBAL RUNOFF DATA CENTRE (GRDC)
20 LARGEST RIVERS

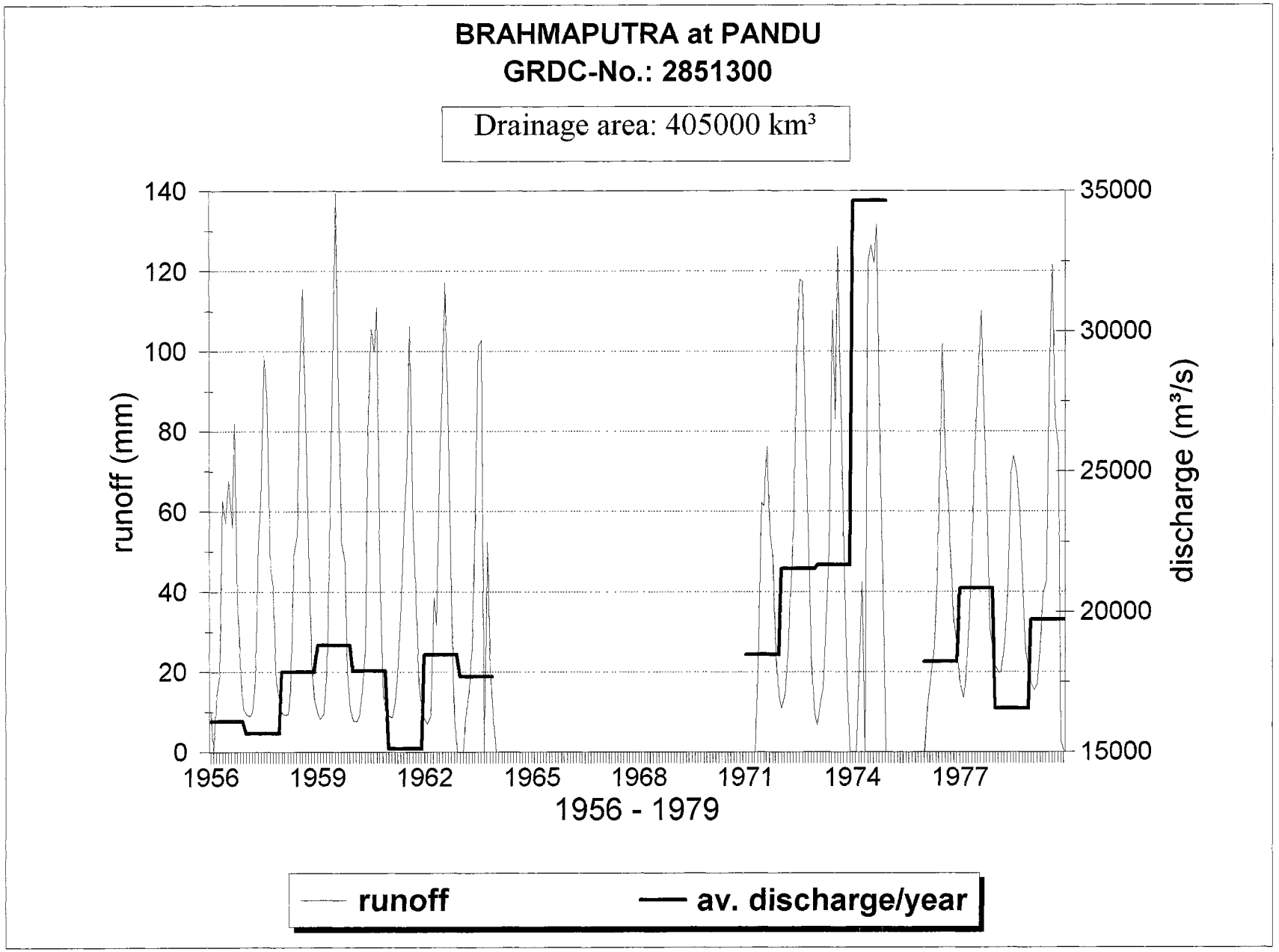
	BRAHMAPUTRA							
No.	River	Station	Area (km²)	Latitude	Longitude	first rec.	last rec.	day/month
1	Tista	Kaunia		2575N	8950E	1 1969	12 1975	M
2	**Brahmaputra**	**Bahadurabad**	**636130**	**2518N**	**8967E**	**1 1969**	**12 1975**	M
3	Tista	Anderson Br.		2700N	8800E	1 1965	12 1971	M
4	Manas	Mathanguri	32770	2665N	9095E	2 1955	12 1974	M
5	Brahmaputra	Pandu	405000	2613N	9170E	1 1956	11 1979	M
6	Jia Bhorelli	N.T. Road Crossing	10820	2683N	9292E	1 1958	12 1979	M

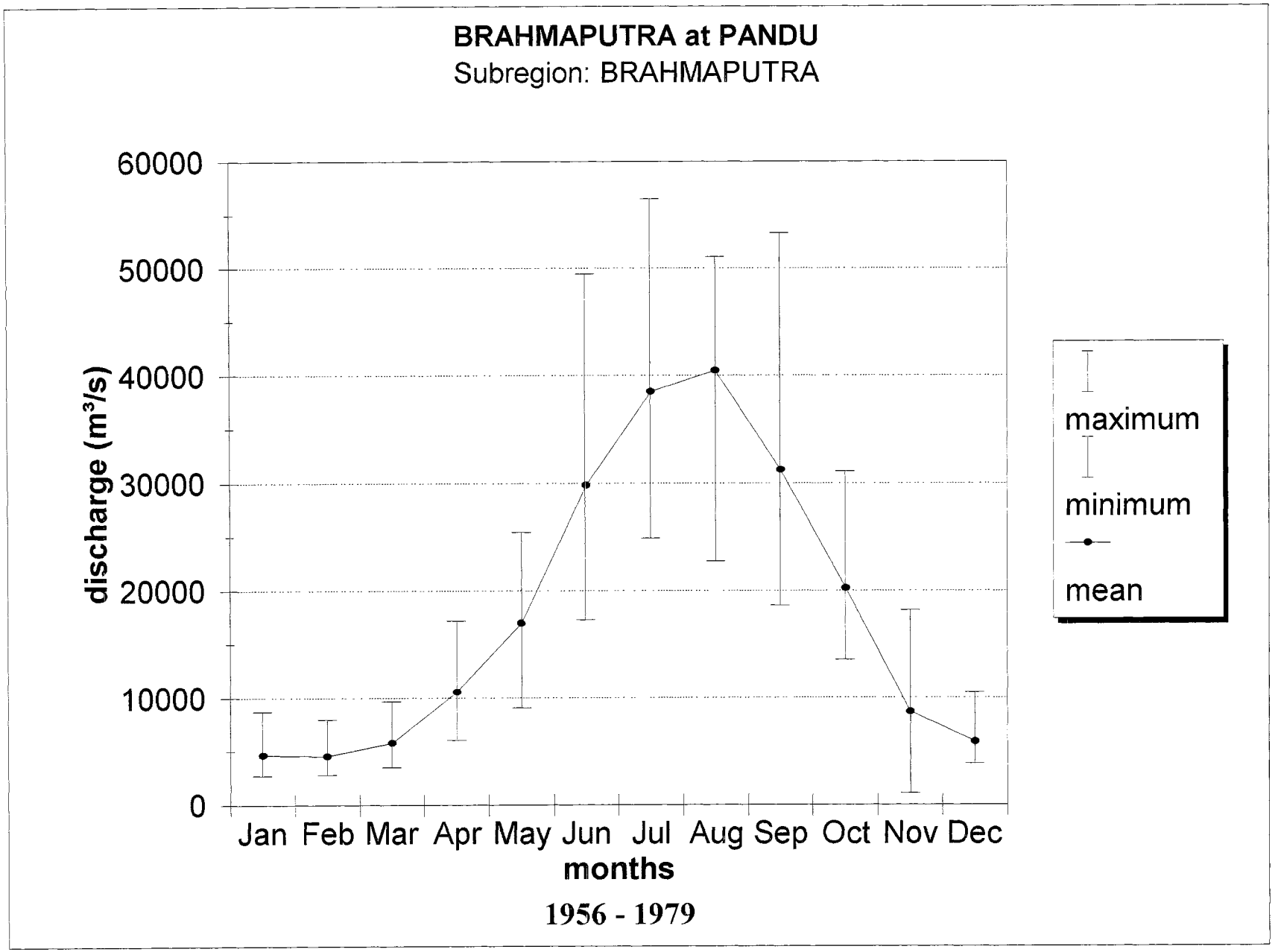

BRAHMAPUTRA at BAHADURABAD
GRDC-No.: 2651100
Drainage area: 636130 km³
runoff (mm)
discharge (m³/s)
100
80
60
40
20
0
25000
20000
15000
10000
5000
0
1969
1970
1971
1972
1973
1974
1975
1969 - 1975
runoff
av. discharge/year

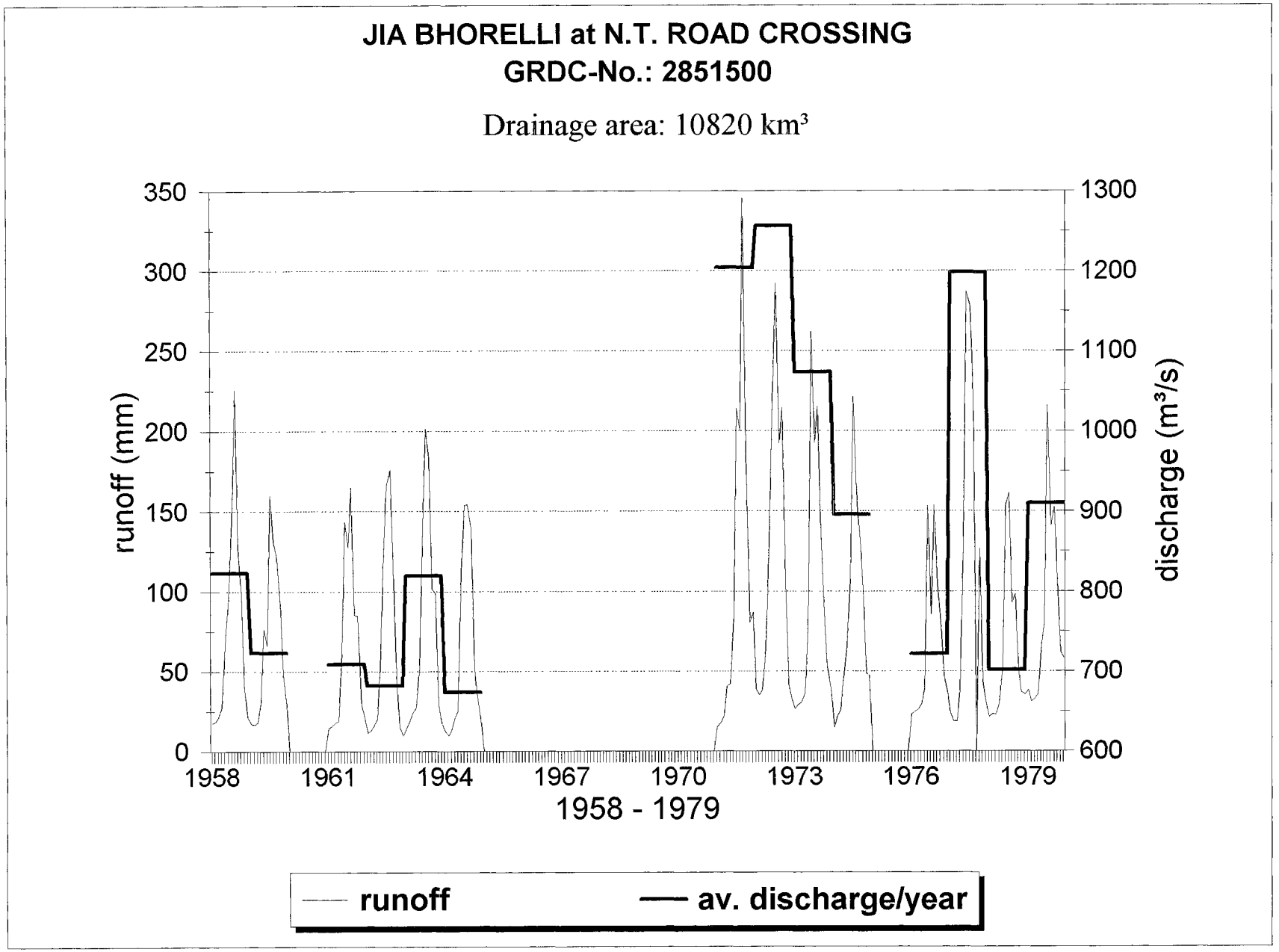

BRAHMAPUTRA at BAHADURABAD
Subregion: BRAHMAPUTRA
60000
50000
40000
30000
20000
10000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
maximum
minimum
mean
1969 - 1975

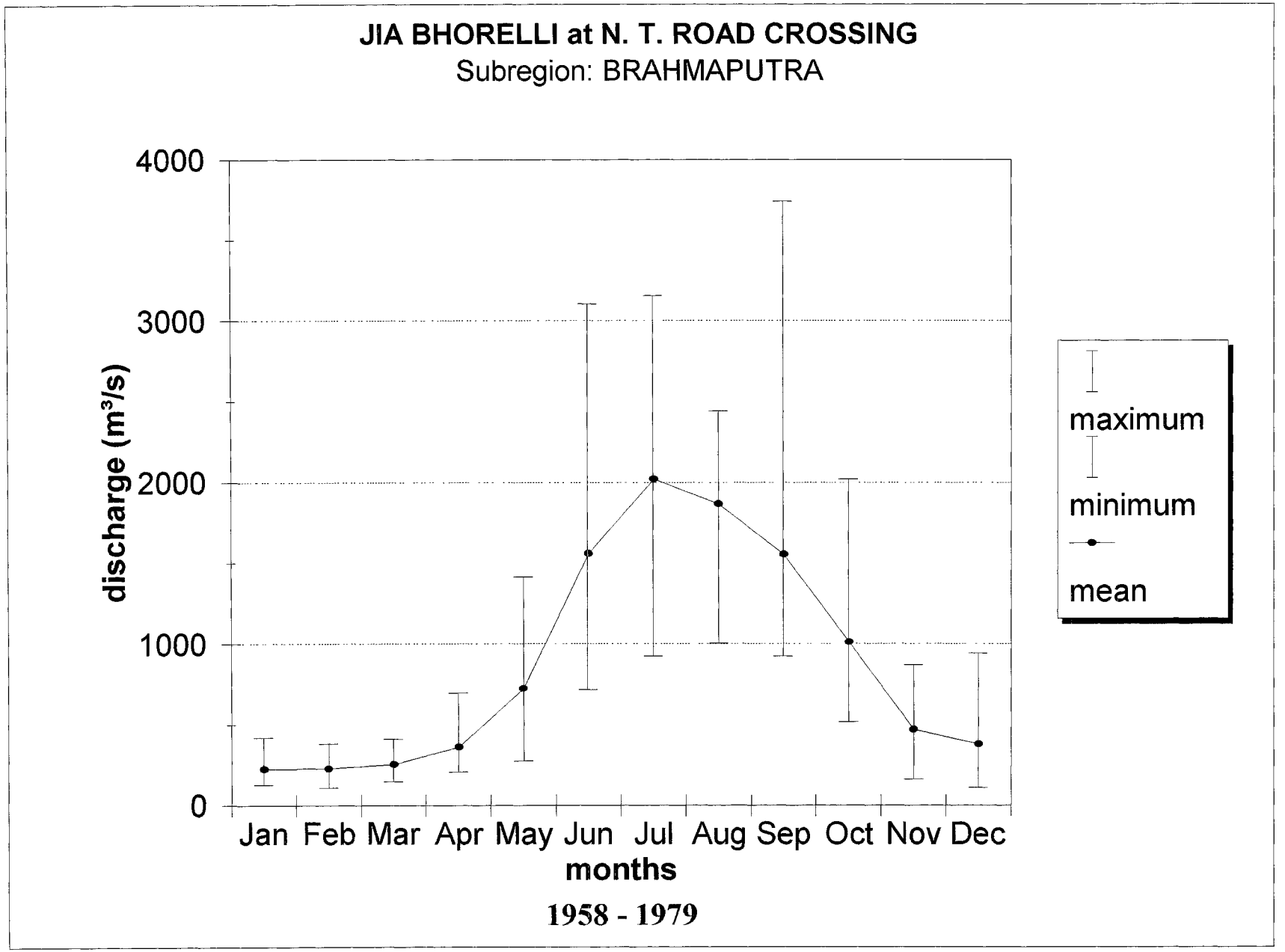

MANAS at MATHANGURI
GRDC-No.: 2851250
Drainage area: 32770 km³
runoff (mm)
discharge (m³/s)
250
200
150
100
50
0
3000
2500
2000
1500
1000
500
1955
1958
1961
1964
1967
1970
1973
1955 - 1974
runoff
av. discharge/year


MANAS at MATHANGURI
Subregion: BRAHMAPUTRA
discharge (m³/s)
8000
7000
6000
5000
4000
3000
2000
1000
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1955 - 1974
maximum
minimum
mean


BRAHMAPUTRA at PANDU
GRDC-No.: 2851300
Drainage area: 405000 km³
runoff (mm)
discharge (m³/s)
140
120
100
80
60
40
20
0
35000
30000
25000
20000
15000
1956
1959
1962
1965
1968
1971
1974
1977
1956 - 1979
runoff
av. discharge/year


BRAHMAPUTRA at PANDU
Subregion: BRAHMAPUTRA
60000
50000
40000
30000
20000
10000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
maximum
minimum
mean
1956 - 1979

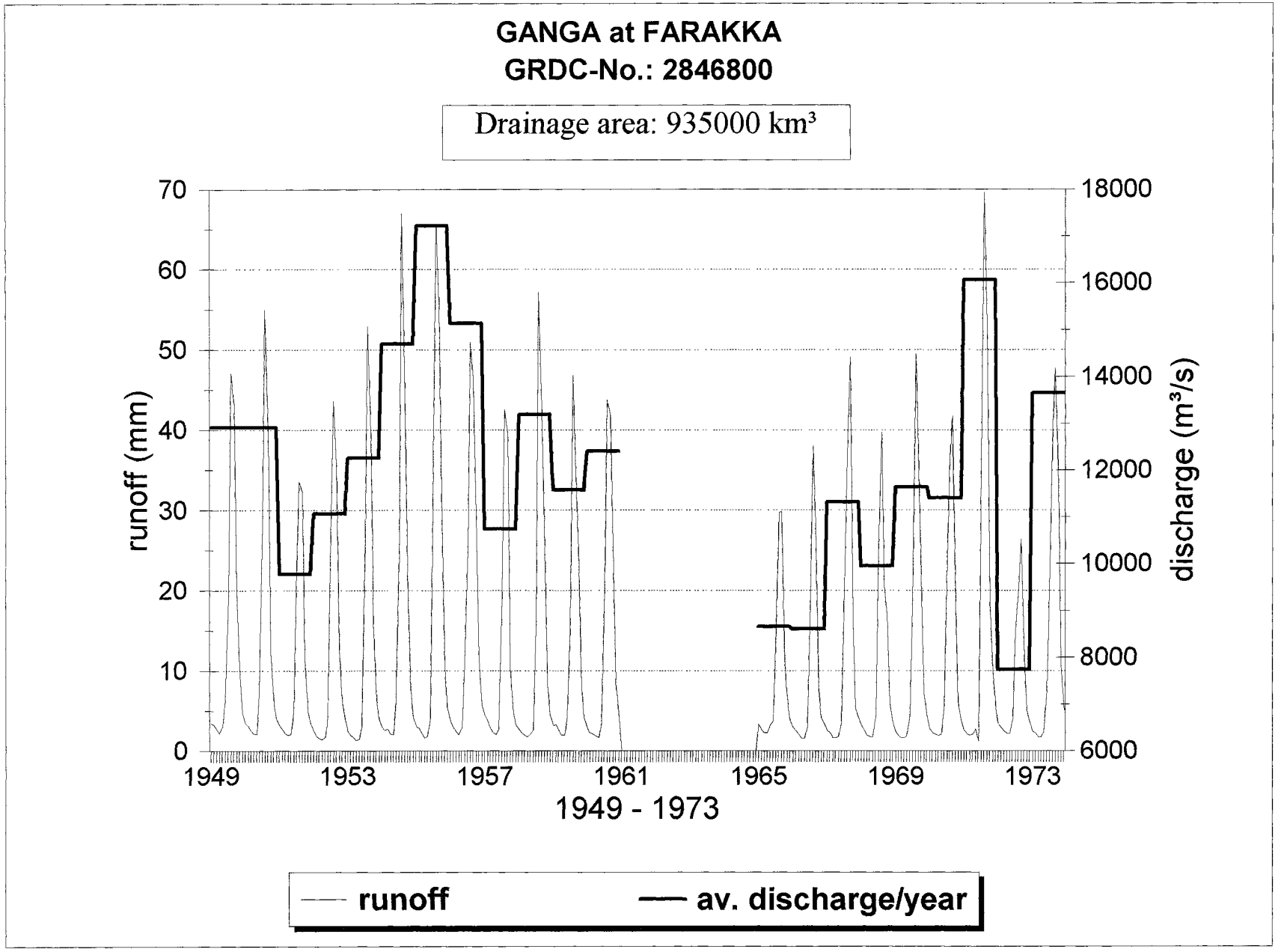

JIA BHORELLI at N.T. ROAD CROSSING
GRDC-No.: 2851500
Drainage area: 10820 km³
runoff (mm)
discharge (m³/s)
350
300
250
200
150
100
50
0
1300
1200
1100
1000
900
800
700
600
1958
1961
1964
1967
1970
1973
1976
1979
1958 - 1979
runoff
av. discharge/year

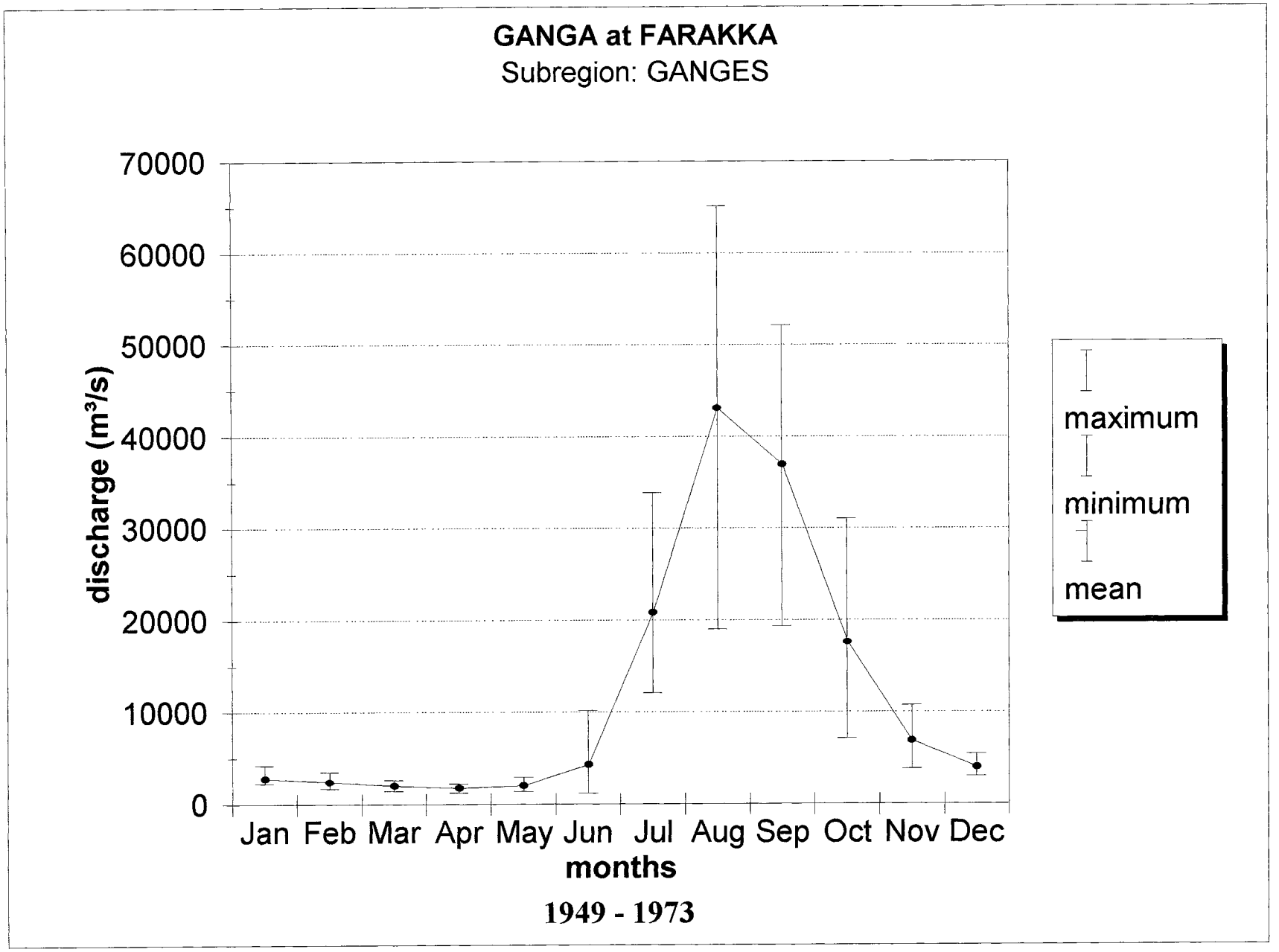

JIA BHORELLI at N. T. ROAD CROSSING
Subregion: BRAHMAPUTRA
4000
3000
2000
1000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1958 - 1979
maximum
minimum
mean

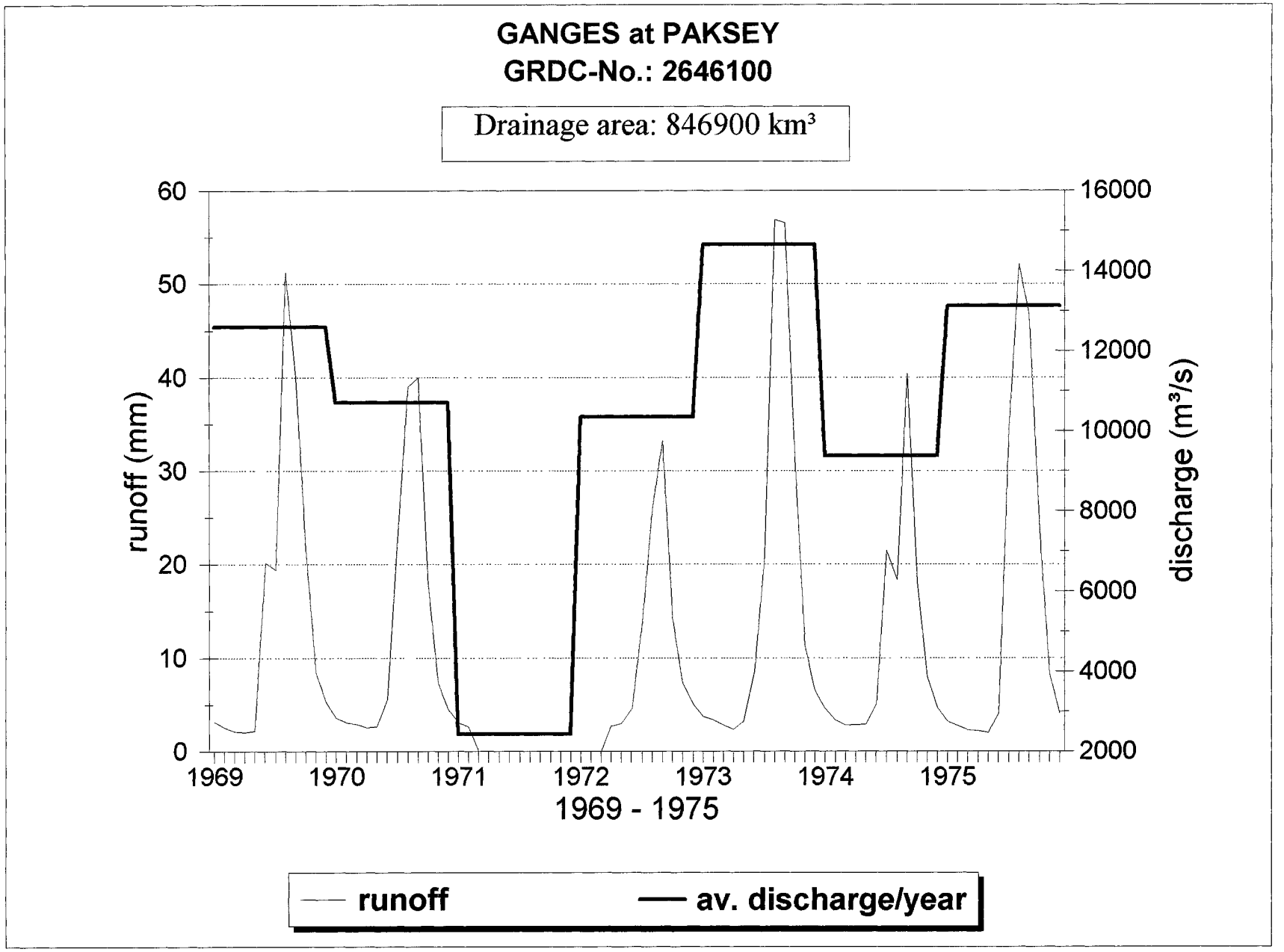
GANGES BASIN
GRDC - Stations
1
2
3
4
5
6
7
8
9
10

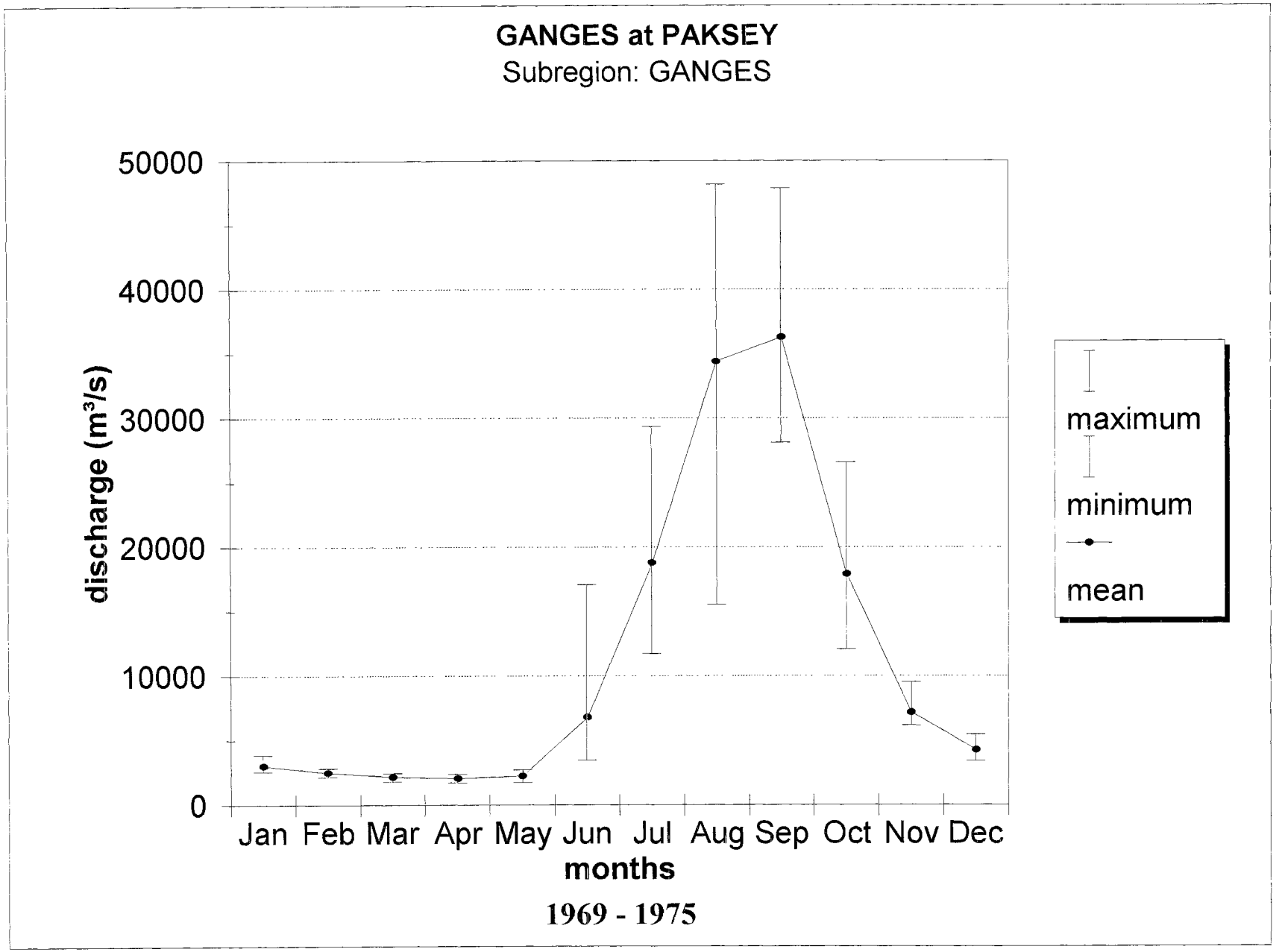
GLOBAL RUNOFF DATA CENTRE (GRDC)
20 LARGEST RIVERS

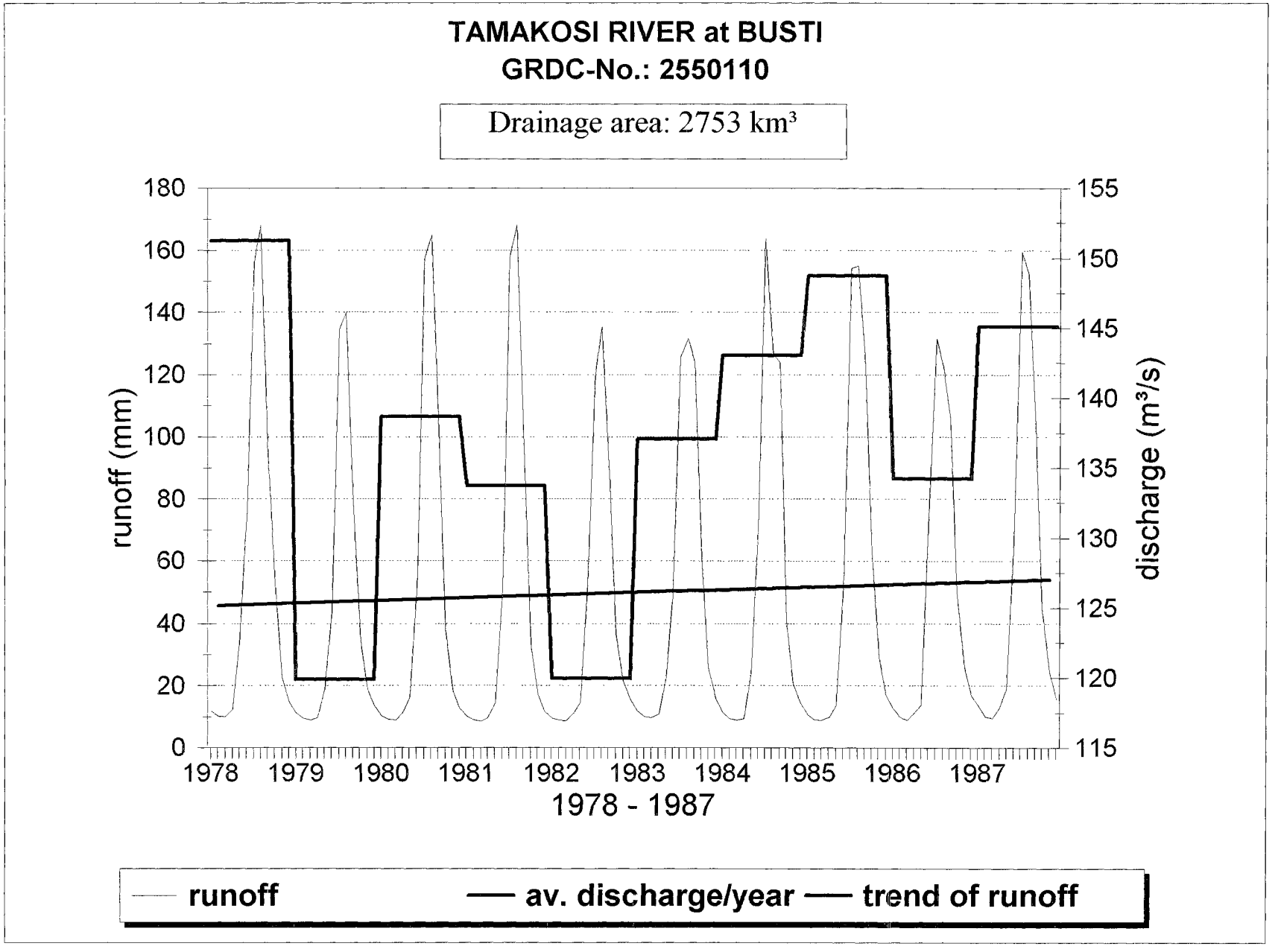
	GANGES							
No.	River	Station	Area (km²)	Latitude	Longitude	first rec.	last rec.	day/month
1	Ganges	Paksey	846900	2408N	8903E	1 1969	12 1975	M
2	**Ganga**	**Farakka**	**935000**	**2500N**	**8792E**	**1 1949**	**12 1973**	M
3	Jhimruk Khola	Tigra Gaon	683	2805N	8283E	1 1978	12 1985	D
4	Seti River	Banga near Belgaon	7460	2898N	8114E	1 1978	12 1987	D
5	Rapti River	Rajaiya	579	2744N	8497E	1 1978	12 1988	D
6	Tadi Khola	Tadipul Belkot	653	2786N	8514E	1 1978	12 1986	D
7	Chepe Khola	Garam Besi	308	2806N	8449E	1 1978	3 1986	D
8	Andhi Khola	Dumrichaur Andhimuha	476	2797N	8359E	1 1978	12 1988	D
9	Tamakosi	Busti	2753	2763N	8608E	1 1978	12 1987	D
10	Balephi Khola	Jalbire	629	2781N	8577E	1 1978	12 1988	D

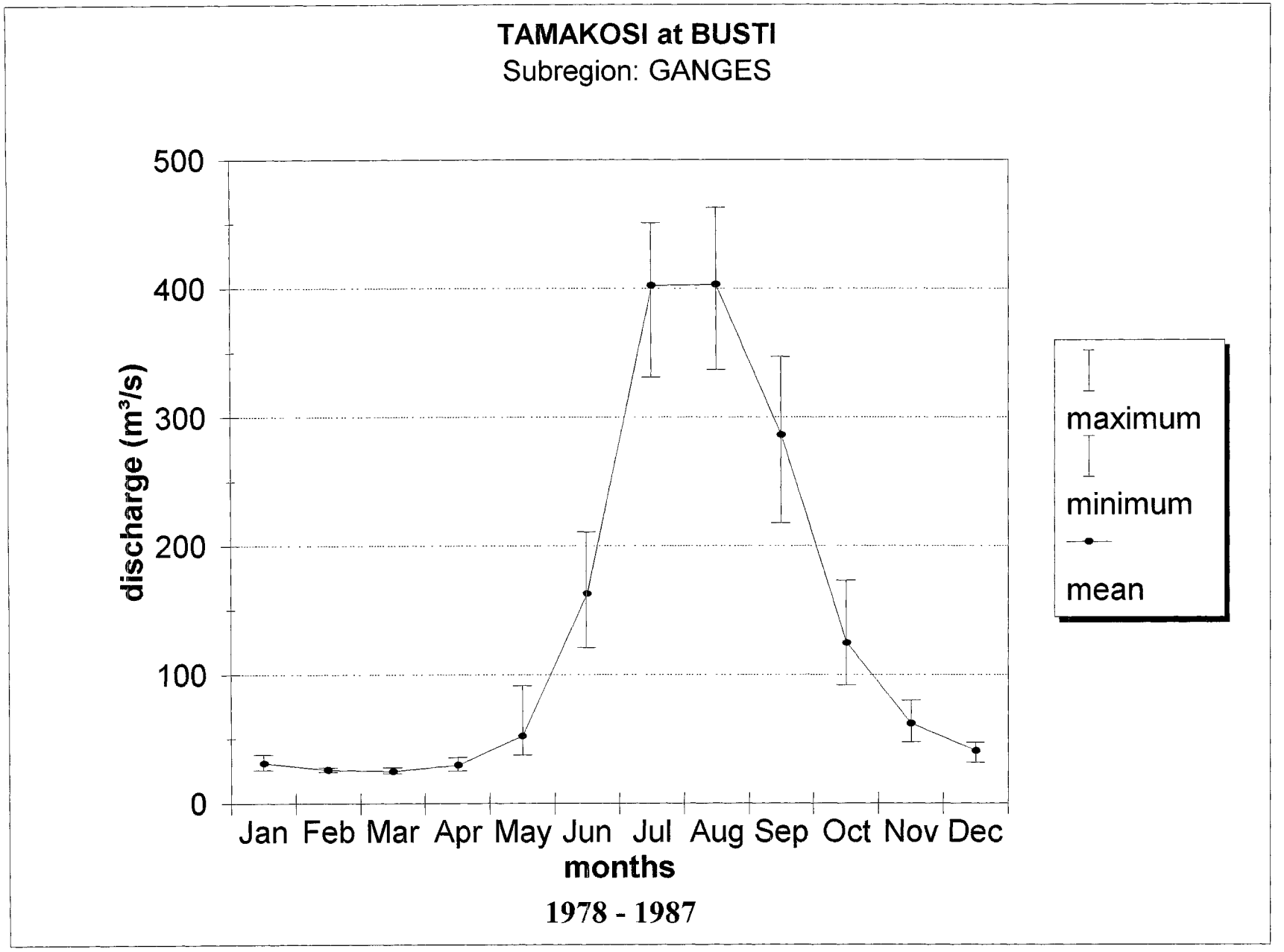

GANGA at FARAKKA
GRDC-No.: 2846800
Drainage area: 935000 km³
runoff (mm)
discharge (m³/s)
0
10
20
30
40
50
60
70
6000
8000
10000
12000
14000
16000
18000
1949
1953
1957
1961
1965
1969
1973
1949 - 1973
runoff
av. discharge/year

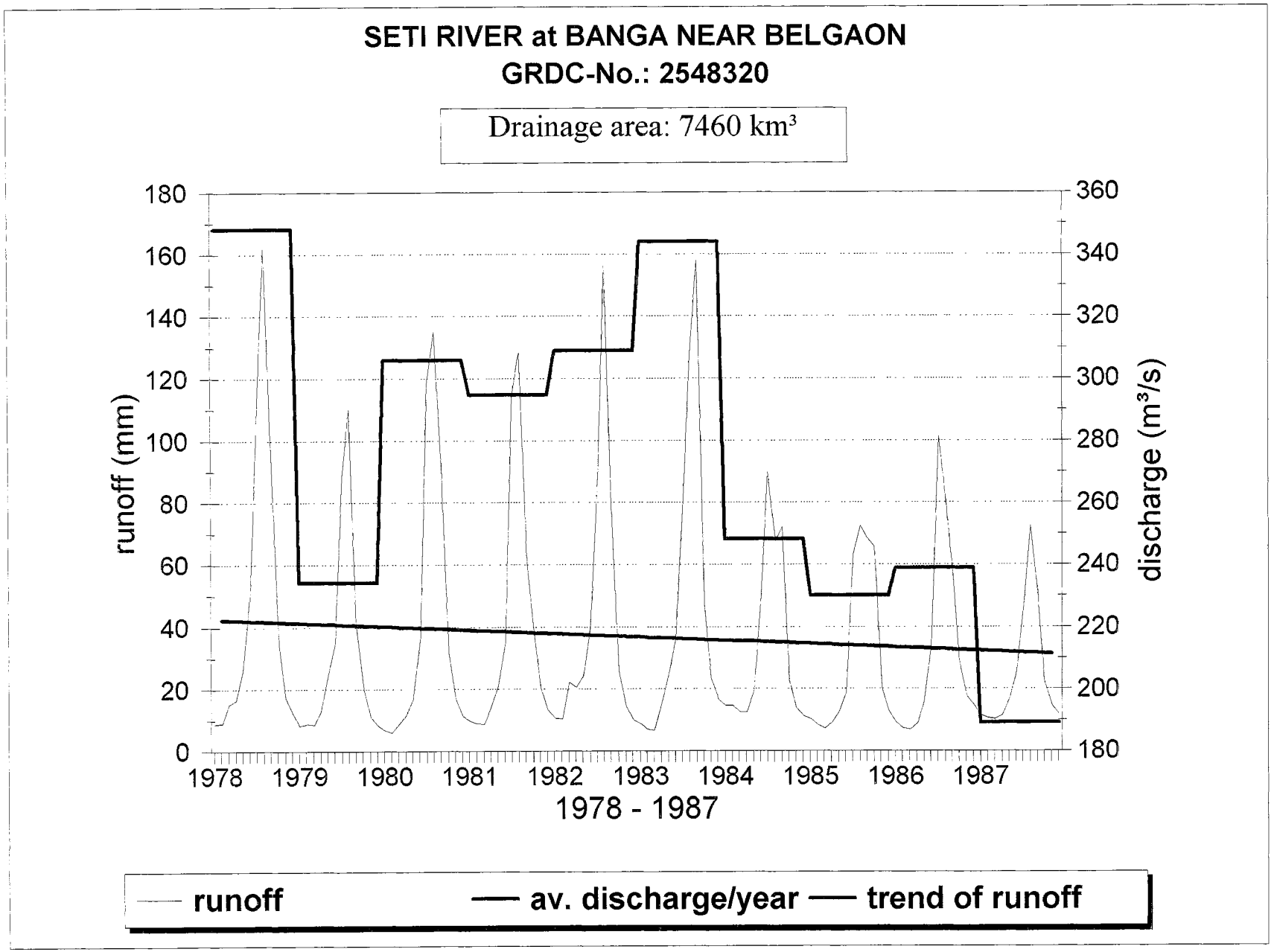

GANGA at FARAKKA
Subregion: GANGES
discharge (m³/s)
70000
60000
50000
40000
30000
20000
10000
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1949 - 1973
maximum
minimum
mean

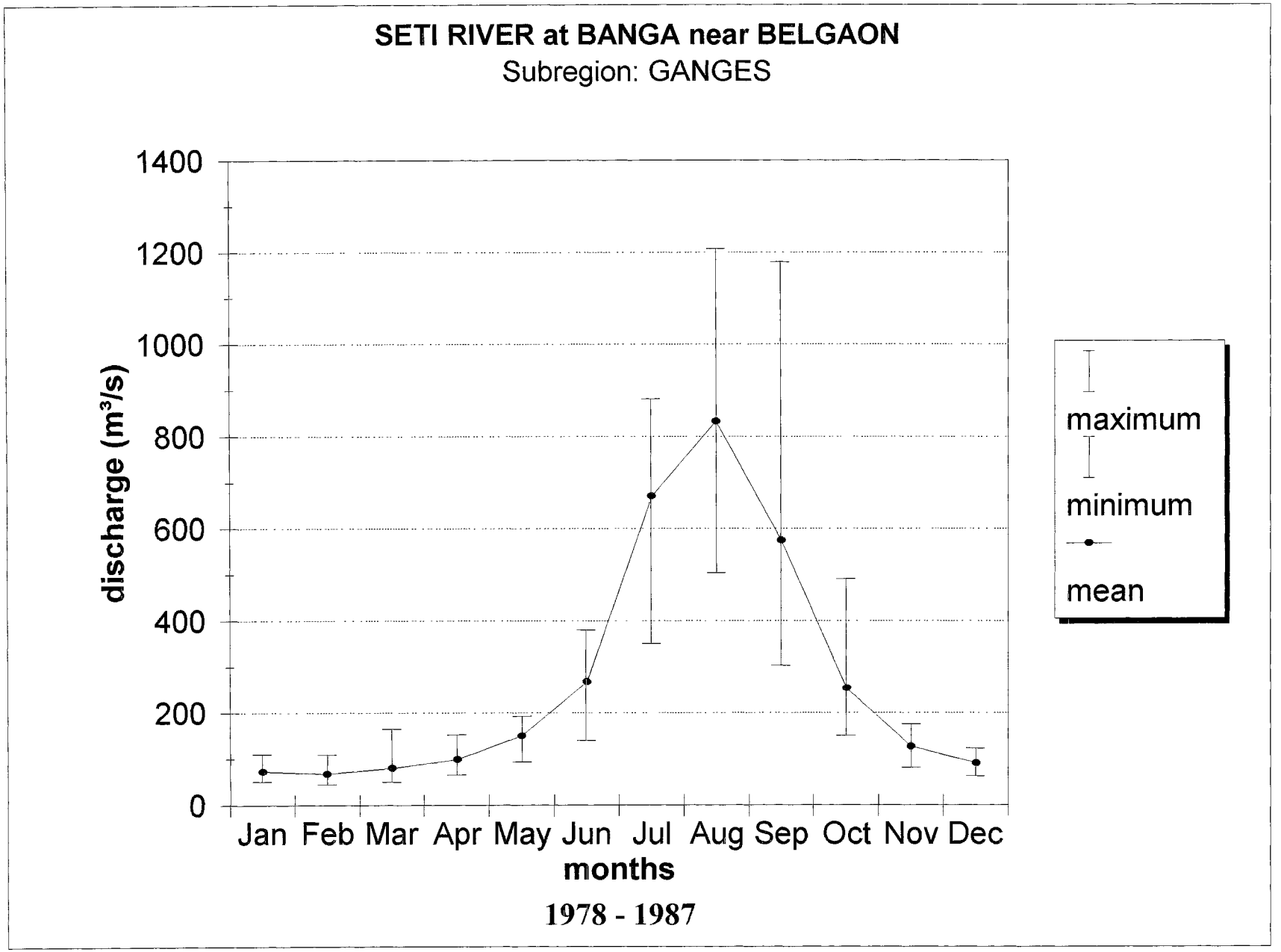

GANGES at PAKSEY
GRDC-No.: 2646100
Drainage area: 846900 km³
runoff (mm)
discharge (m³/s)
60
50
40
30
20
10
0
16000
14000
12000
10000
8000
6000
4000
2000
1969
1970
1971
1972
1973
1974
1975
1969 - 1975
runoff
av. discharge/year

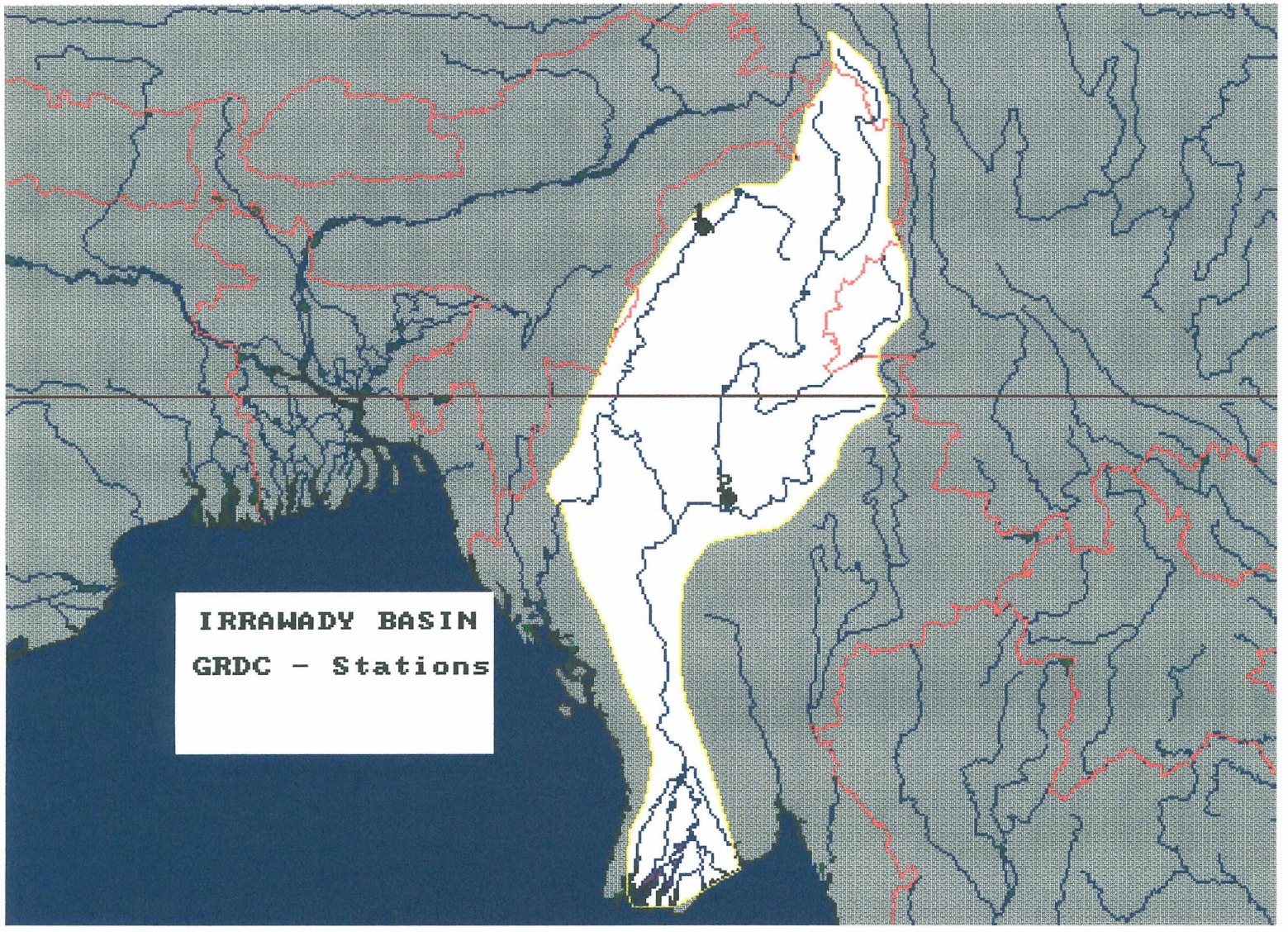

GANGES at PAKSEY
Subregion: GANGES
50000
40000
30000
20000
10000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
maximum
minimum
mean
1969 - 1975


TAMAKOSI RIVER at BUSTI
GRDC-No.: 2550110
Drainage area: 2753 km³
runoff (mm)
discharge (m³/s)
180
160
140
120
100
80
60
40
20
0
155
150
145
140
135
130
125
120
115
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1978 - 1987
runoff
av. discharge/year
trend of runoff


TAMAKOSI at BUSTI
Subregion: GANGES
500
400
300
200
100
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1978 - 1987
maximum
minimum
mean

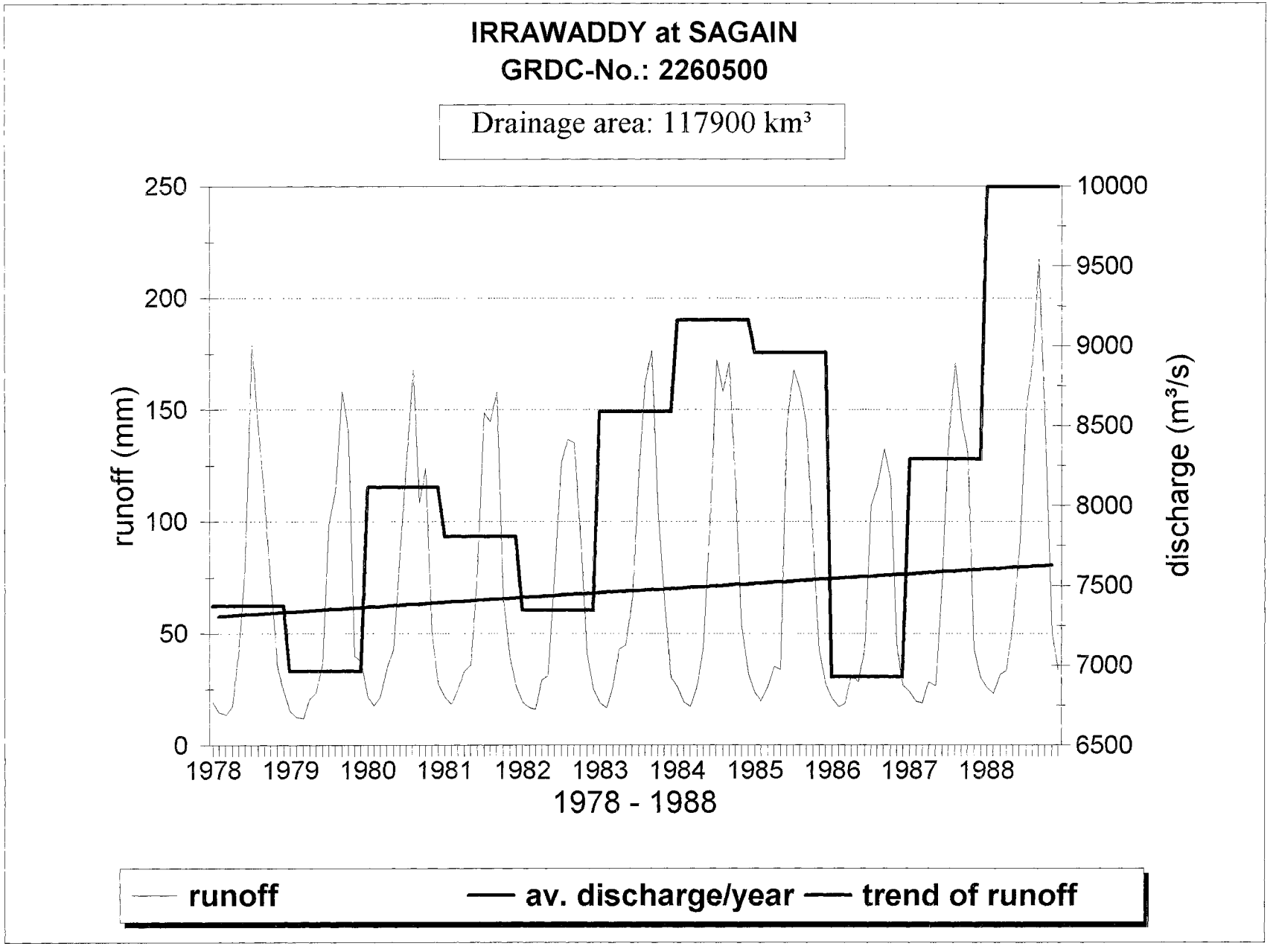

SETI RIVER at BANGA NEAR BELGAON
GRDC-No.: 2548320
Drainage area: 7460 km³
runoff (mm)
discharge (m³/s)
0
20
40
60
80
100
120
140
160
180
180
200
220
240
260
280
300
320
340
360
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1978 - 1987
runoff
av. discharge/year
trend of runoff

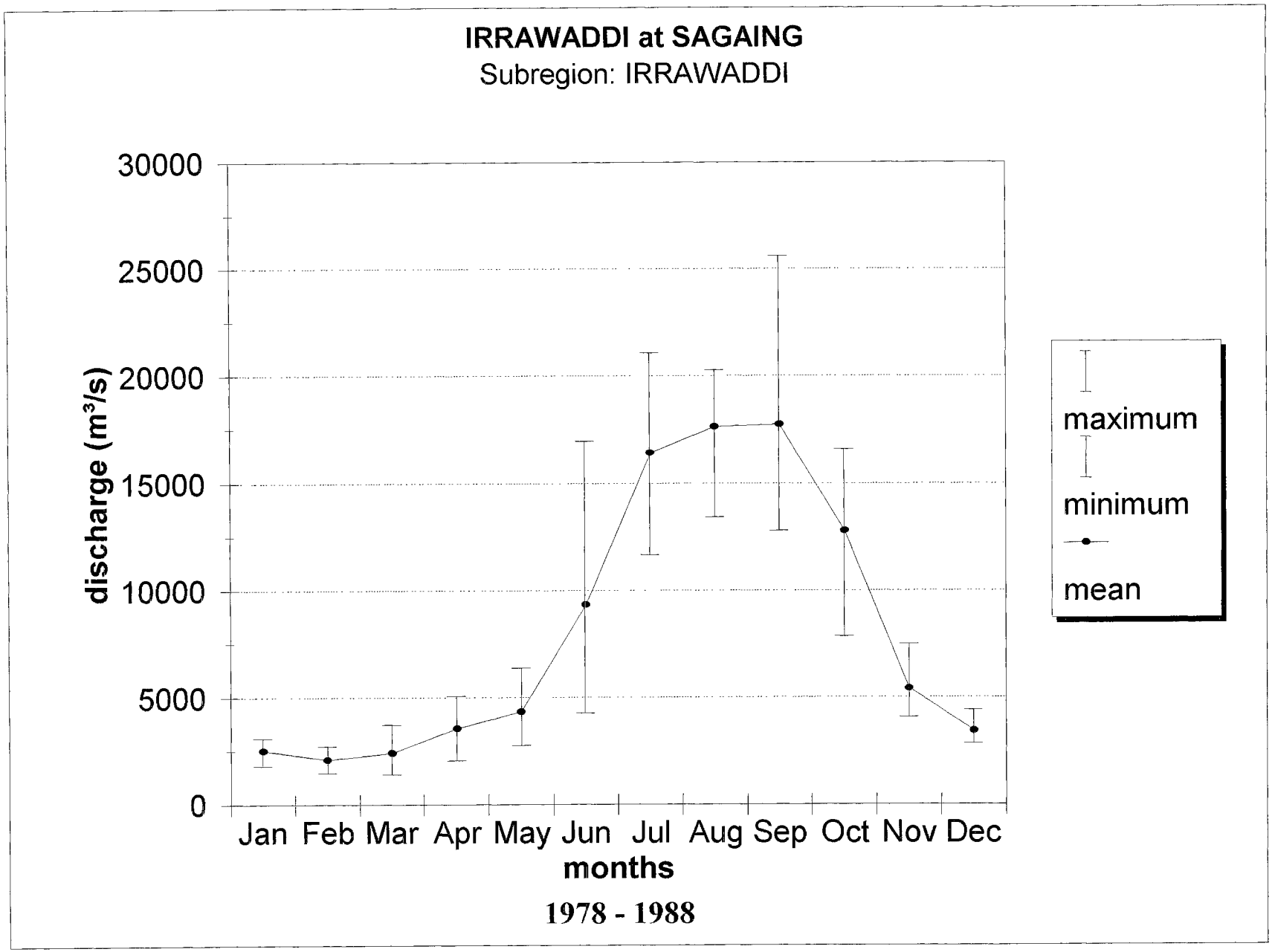

SETI RIVER at BANGA near BELGAON
Subregion: GANGES
1400
1200
1000
800
600
400
200
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1978 - 1987
maximum
minimum
mean

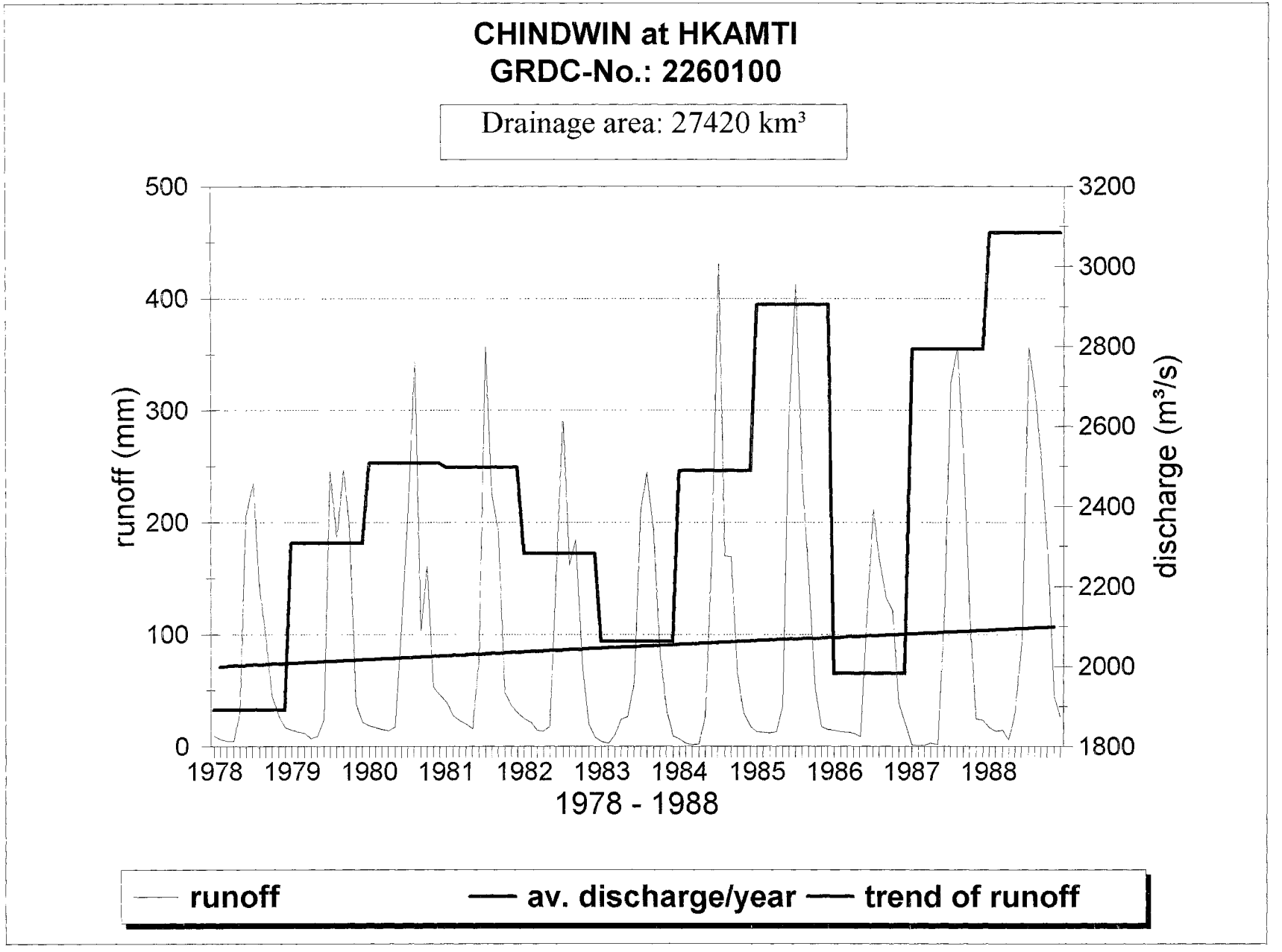

IRRAWADY BASIN
GRDC - Stations

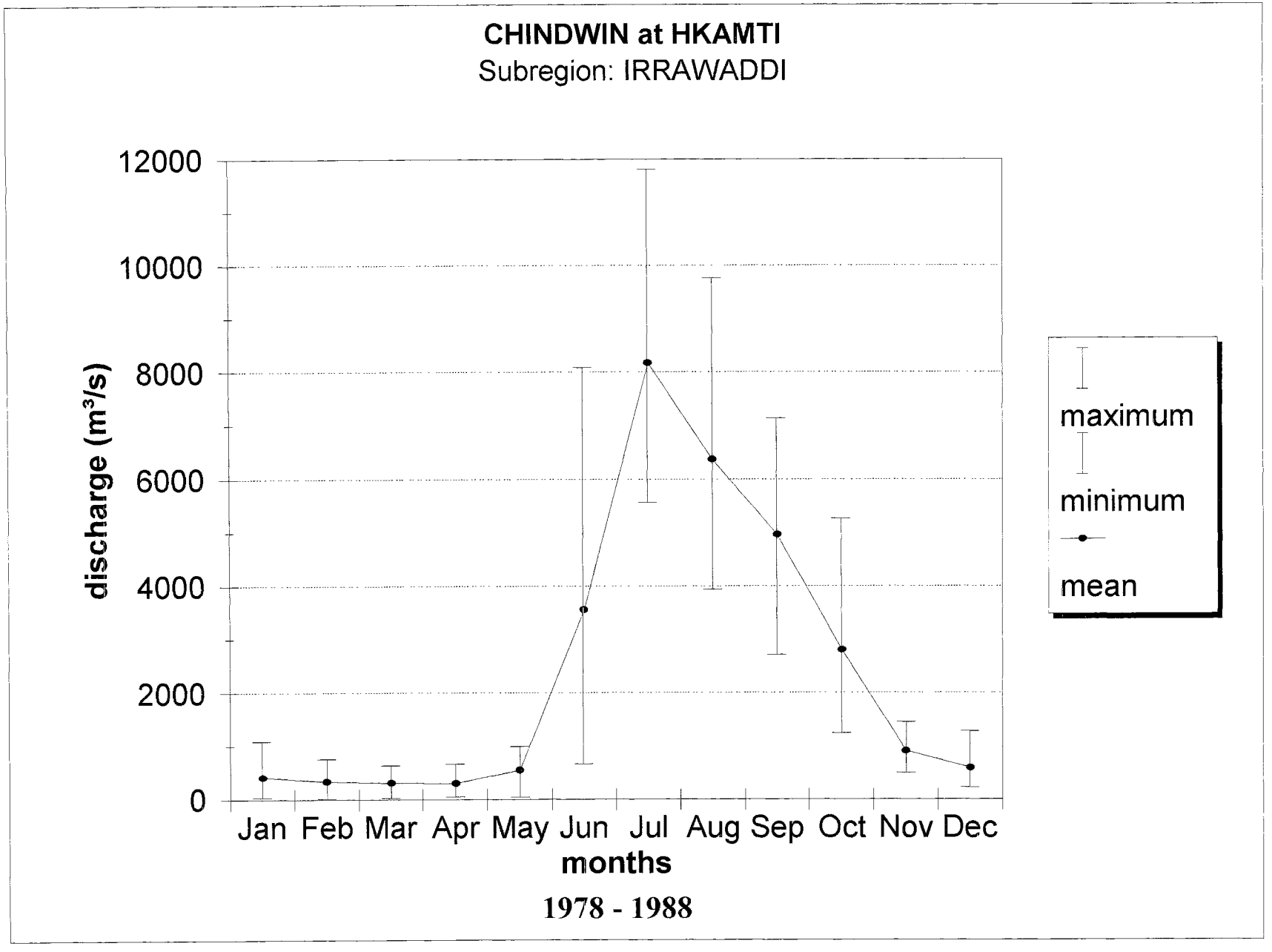
GLOBAL RUNOFF DATA CENTRE (GRDC)
20 LARGEST RIVERS

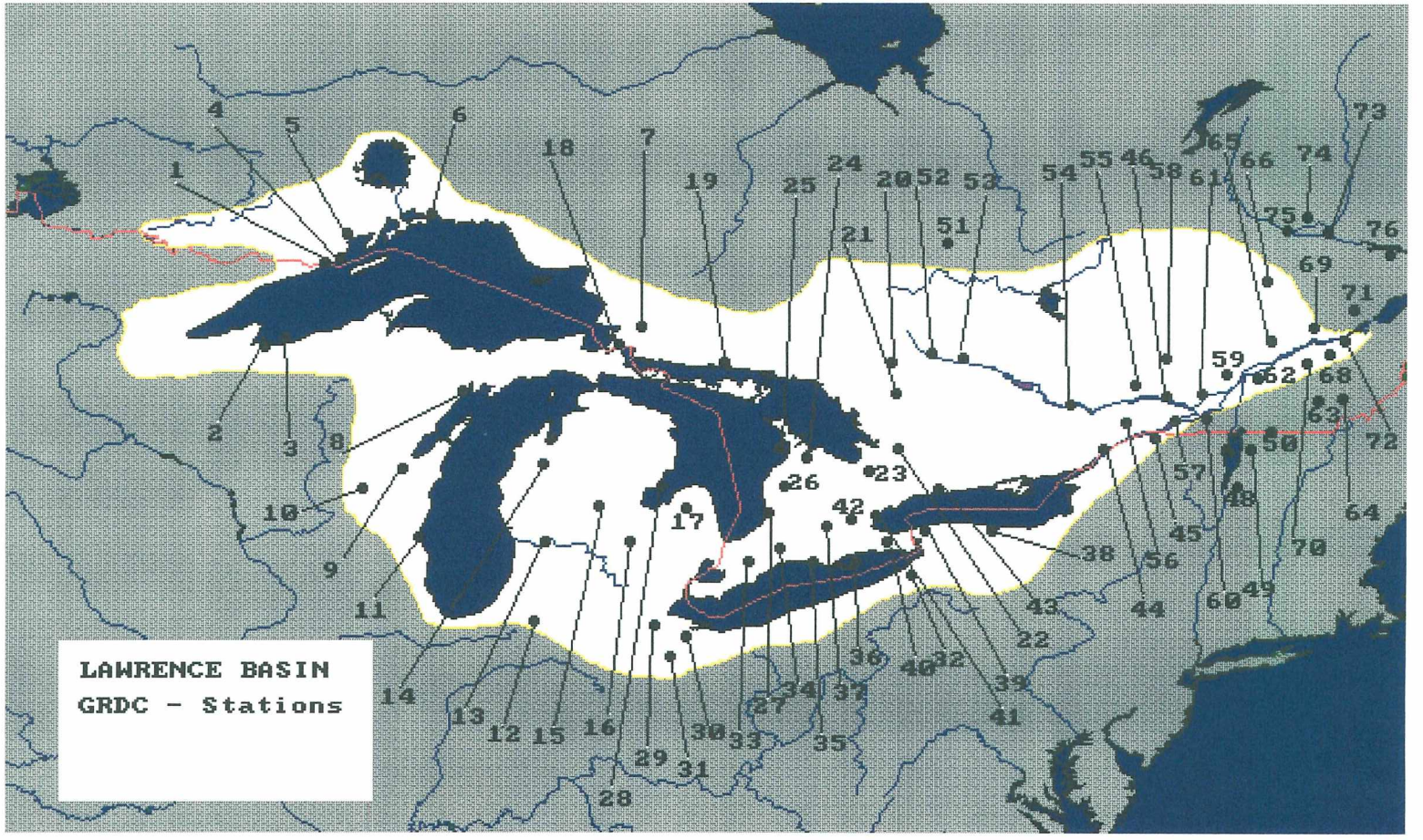
	IRRAWADDI							
No.	River	Station	Area (km²)	Latitude	Longitude	first rec.	last rec.	day/month
1	Chindwin	Hkamti	27420	2600N	9570E	1 1978	12 1988	D
2	**Irrawaddy**	**Sagaing**	**117900**	**2198N**	**9610E**	**1 1978**	**12 1988**	**D**


IRRAWADDY at SAGAIN
GRDC-No.: 2260500
Drainage area: 117900 km³
runoff (mm)
discharge (m³/s)
250
200
150
100
50
0
10000
9500
9000
8500
8000
7500
7000
6500
1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988
1978 - 1988
runoff
av. discharge/year
trend of runoff


IRRAWADDI at SAGAING
Subregion: IRRAWADDI
30000
25000
20000
15000
10000
5000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1978 - 1988
maximum
minimum
mean


CHINDWIN at HKAMTI
GRDC-No.: 2260100
Drainage area: 27420 km³
runoff (mm)
discharge (m³/s)
500
400
300
200
100
0
3200
3000
2800
2600
2400
2200
2000
1800
1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988
1978 - 1988
runoff
av. discharge/year
trend of runoff


CHINDWIN at HKAMTI
Subregion: IRRAWADDI
12000
10000
8000
6000
4000
2000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1978 - 1988
maximum
minimum
mean


LAWRENCE BASIN
GRDC - Stations

GLOBAL RUNOFF DATA CENTRE (GRDC)
20 LARGEST RIVERS

	LAWRENCE							table 1
No.	River	Station	Area (km²)	Latitude	Longitude	first rec.	last rec.	day/month
1	Pigeon River	Middle Falls near Grand Portage Minn.	1554	4801N	8962W	1 1978	12 1990	D
2	Bad River	near Odanah Wis.	1546	4649N	9070W	1 1978	9 1989	D
3	Tahquamenon River	near Paradise Mich.	2046	4657N	8527W	1 1978	9 1990	D
4	Pigeon River	Middle Falls	1550	4800N	8960W	1 1978	12 1989	D
4	Pigeon River	Middle Falls	1550	4800N	8960W	1 1924	12 1987	M
5	Neebing	near Thunder Bay	187	4838N	8931W	1 1954	12 1987	M
6	Gravel River	near Cavers	616	4892N	8768W	1 1978	12 1989	D
7	Goulais River	near Searchmont	1160	4685N	8397W	1 1978	12 1989	D
8	Ford River	near Hyde Mich.	1166	4576N	8720W	1 1978	9 1990	D
9	Fox River	Wrightstown Wis.	16084	4433N	8817W	1 1965	12 1984	M
10	Fox River	Berlin Wis.	3471	4395N	8895W	1 1978	9 1989	D
11	Milwaukee River	Milwaukee Wis.	1803	4310N	8791W	1 1978	9 1989	D
12	Elkhart River	Goshen Ind.	1538	4159N	8585W	1 1978	12 1990	D
13	Grand	Grand Rapids Mich.	12691	4297N	8568W	1 1965	12 1984	M
14	Manistee River	near Sherman Mich.	2331	4444N	8570W	1 1978	9 1990	D
15	Chippewa River	near Mount Pleasant Mich.	1077	4363N	8471W	1 1978	9 1990	D
16	Shiawassee River	Owosso Mich.	1393	4301N	8418W	1 1978	9 1990	D
17	Cass River	Cass City Mich.	930	4358N	8318W	1 1978	9 1990	D
18	St. Mary's River	Sault Ste. Marie	210000	4652N	8437W	1 1860	12 1990	D
18	St. Mary's River	Sault Ste. Marie	210000	4652N	8437W	1 1860	12 1984	M
19	Serpent River	Highway No.17	1350	4620N	8250W	1 1978	12 1989	D
20	la Vase River	North Bay	70.4	4625N	7938W	1 1978	12 1989	D
21	North Magnetawan River	near Burk's Falls	321	4567N	7937W	1 1978	12 1989	D
21	North Magnetawan River	near Burk's Falls	321	4567N	7937W	1 1916	12 1987	M
22	Black	near Washago	1520	4471N	7928W	1 1916	12 1987	M
23	Nottawasaga	near Baxter	1180	4425N	7982W	1 1950	12 1987	M
24	Sydenham	near Owen Sound	181	4452N	8093W	1 1949	12 1987	M
25	Sauble	Sauble Falls	927	4467N	8125W	1 1958	12 1987	M
26	Saugeen River	near Port Elgin	3960	4445N	8132W	1 1978	12 1989	D
	Carrick Creek	near Carlsruhe	163	4411N	000W	1 1954	12 1987	M
27	Bayfield River	near Varna	466	4355N	8158W	1 1978	12 1989	D

GLOBAL RUNOFF DATA CENTRE (GRDC)
20 LARGEST RIVERS

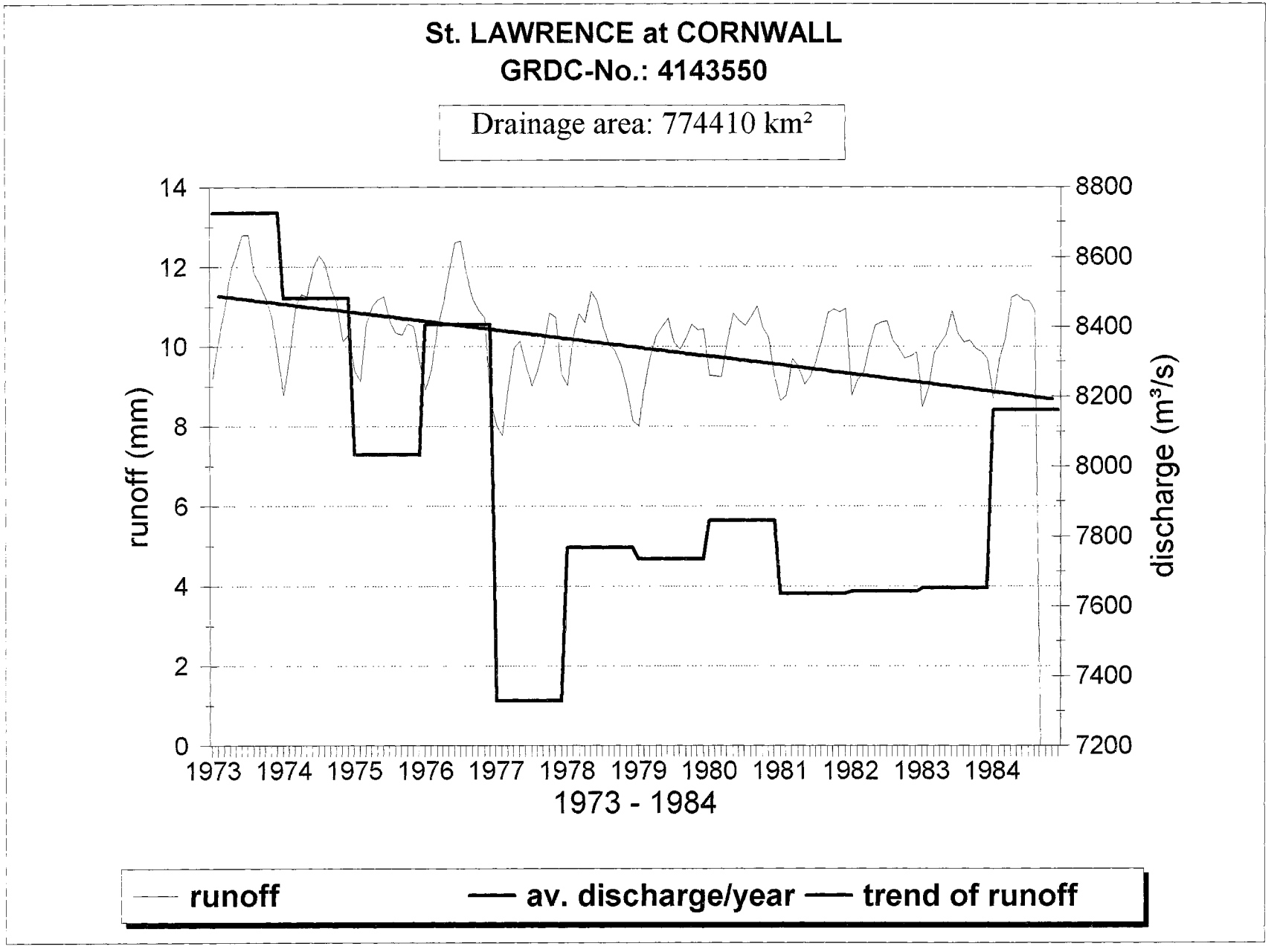
	LAWRENCE							table 2
No.	River	Station	Area (km²)	Latitude	Longitude	first rec.	last rec.	day/month
	Ausable	near Springbank	865	000N	8166W	1 1948	12 1987	M
28	River Raisin	near Monroe Mich.	2707	4196N	8353W	1 1978	9 1990	D
29	Maumee	Waterville Ohio	16395	4150N	8372W	1 1965	12 1984	M
30	Sandusky River	near Fremont Ohio	3240	4131N	8316W	1 1978	9 1989	D
31	Sandusky River	near Mexico Ohio	2005	4104N	8319W	1 1978	10 1982	D
32	Cattaraugus Creek	Gowanda N.Y.	1119	4246N	7894W	1 1978	12 1990	D
33	Sydenham	near Alvinston	730	4283N	8185W	1 1949	12 1987	M
34	Sydenham River	Strathroy	172	4295N	8162W	1 1978	12 1989	D
35	Big Otter Creek	Tillsonburg	342	4285N	8072W	1 1978	12 1989	D
35	Big Otter Creek	Tillsonburg	342	4285N	8072W	1 1961	12 1987	M
36	Nith	New Hamburg	552	4338N	8071W	1 1951	12 1987	M
37	Nith River	near Canning	1030	4318N	8045W	1 1978	12 1989	D
38	Genesee River	Rochester N.Y.	6365	4318N	7763W	1 1978	12 1990	D
39	Niagara River	Queenston	686000	4315N	7905W	1 1860	12 1990	D
39	Niagara River	Queenston	686000	4315N	7905W	1 1860	12 1984	M
40	Twenty Mile Creek	Balls Falls	293	4313N	7938W	1 1958	12 1987	M
41	East Oakville Creek	near Omagh	199	4348N	7977W	1 1978	12 1989	D
42	East Humber	near Pine Grove	197	4379N	7958W	1 1954	12 1987	M
43	Wilmot Creek	near Newcastle	82.6	4392N	7862W	1 1978	12 1989	D
44	St.Lawrence	Ogdensburg N.Y.	764600	4470N	7550W	6 1860	12 1972	M
45	St Regis River	Brasher Center N.Y.	1595	4486N	7478W	1 1978	12 1990	D
46	**St.Lawrence**	**Cornwall(Ontario) near Massena N.Y.**	**774410**	**4500N**	**7478W**	**1 1973**	**8 1984**	M
47	Saranac River	Plattsburgh N.Y.	1575	4468N	7347W	1 1978	12 1990	D
48	Otter Creek	Middlebury Vt.	1627	4401N	7317W	1 1978	12 1990	D
49	Lamoille River	East Georgia Vt.	1777	4468N	7307W	1 1978	12 1990	D
50	Missisquoi River	near East Berkshire Vt.	1240	4496N	7270W	1 1978	12 1990	D
51	Kinojevis	en aval du Lac Preissac	984	4841N	7836W	1 1939	12 1971	M
52	Ottawa	la Cave Rapids	47900	4638N	7872W	1 1966	12 1984	M
	Unknown River	Station 02ka013				1 1984	9 1988	D
53	Maganasipi	Sortie du Lac Johnson	575	4633N	7835W	1 1978	12 1980	D
54	Ottawa	Chats Falls	89600	4547N	7623W	4 1914	12 1984	M

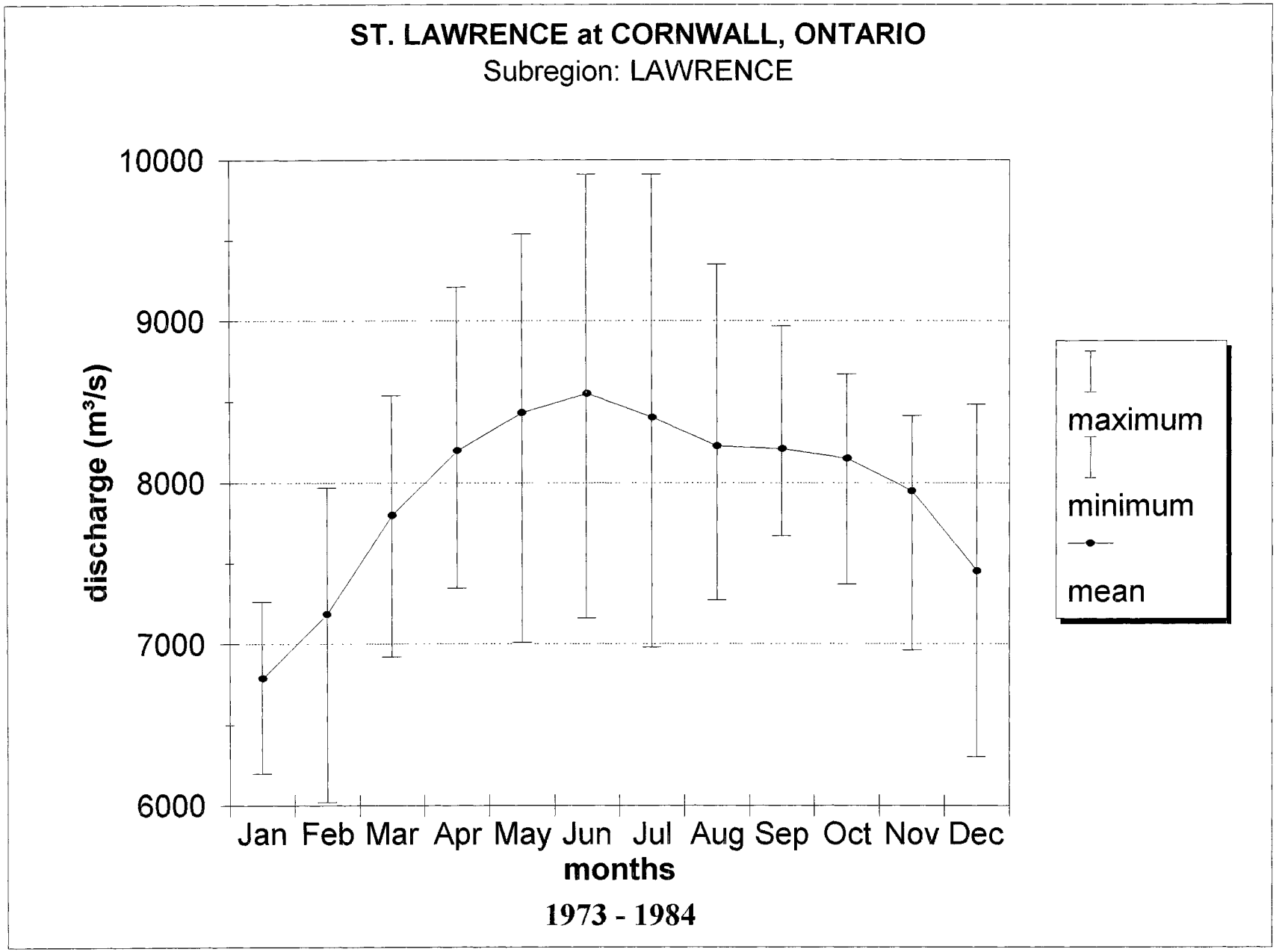
GLOBAL RUNOFF DATA CENTRE (GRDC)
20 LARGEST RIVERS

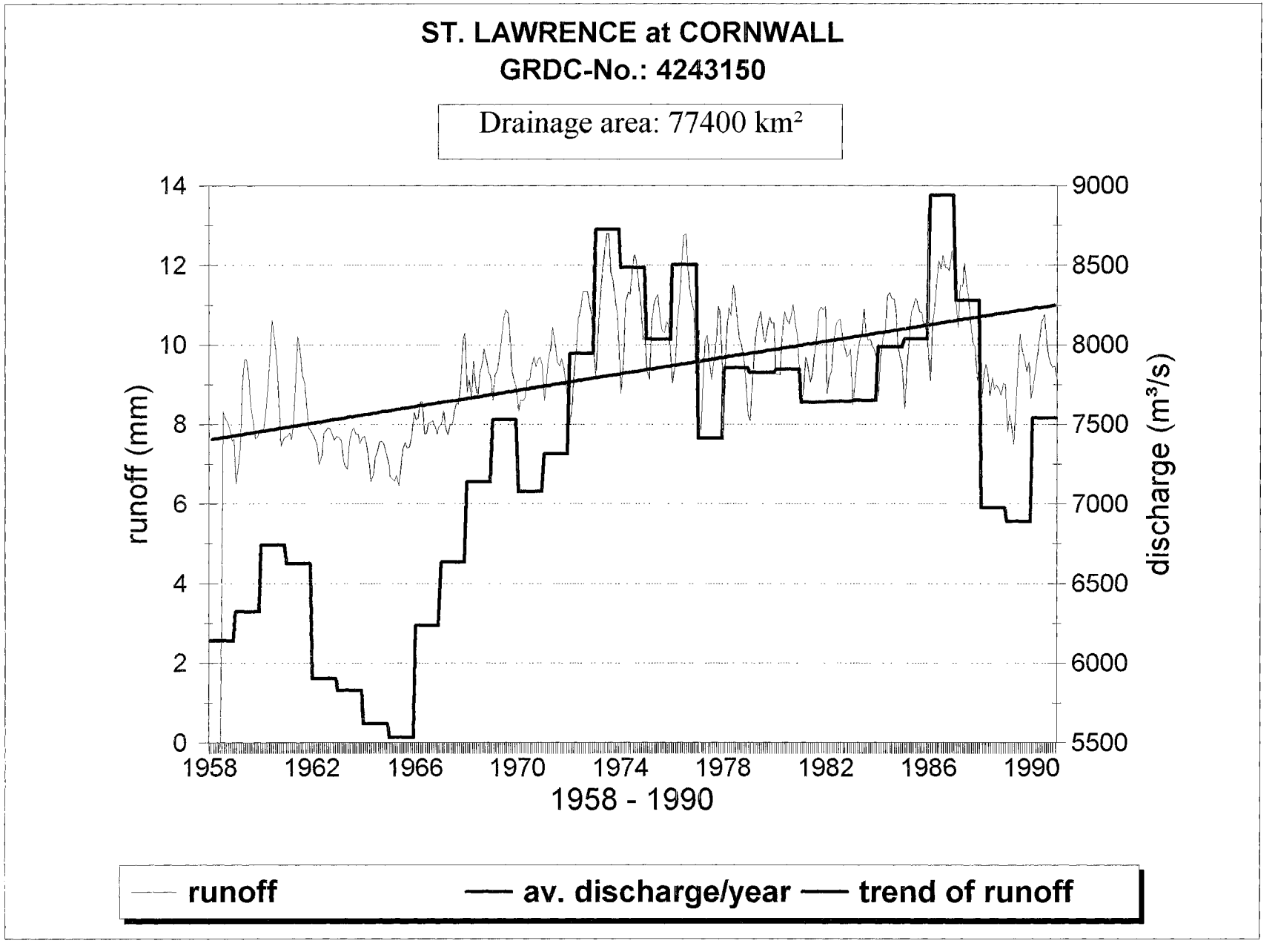
	LAWRENCE							table 3
No.	River	Station	Area (km²)	Latitude	Longitude	first rec.	last rec.	day/month
55	Petite Nation	pres de Cote-Saint-Pierre	1300	4583N	7507W	1 1926	12 1968	M
56	St. Lawrence River	Cornwall	774000	4500N	7480W	7 1958	12 1990	D
56	St. Lawrence River	Cornwall	774000	4500N	7480W	1 1966	12 1984	M
57	Raisin River	near Williamstown	404	4515N	7463W	1 1978	12 1989	D
58	Saint-Louis	Embouchure	39.9	4637N	7450W	1 1978	9 1988	D
59	L'assomption	Joliette	1340	4600N	7342W	1 1978	9 1988	D
60	Des Anglais	Riverfield	686	4517N	7383W	1 1978	9 1988	D
61	Mille Iles	en aval du Lac Des Deux Montagnes	146000	4554N	7387W	5 1913	2 1961	D
61	Mille Iles	en aval du Lac Des Deux Montagnes	146000	4554N	7387W	1 1927	12 1960	M
62	David	Saint-David	342	4595N	7285W	1 1978	12 1980	D
63	Eaton	pres de la Riviere Saint-Francois	642	4547N	7165W	1 1978	12 1980	D
64	Au Saumon	en amont du Ruisseau Moffat	746	4557N	7138W	1 1978	9 1988	D
65	Saint-Maurice	Centrale de Grande-Mere	42000	4662N	7268W	1 1901	12 1984	M
66	Croche	en aval du Ruisseau Changy	1570	4777N	7273W	1 1978	9 1988	D
67	Becancour	Lyster	1410	4637N	7162W	1 1923	12 1968	M
68	Beaurivage	Sainte-Etienne	709	4666N	7129W	1 1926	12 1986	M
69	Sainte-Anne	Chute-Panet	1550	4685N	7187W	1 1978	12 1980	D
70	Becancour	en amont de Riviere Palmer	622	4631N	7145W	1 1978	12 1980	D
71	Des Aulnaies	pres du Ruisseau Des Eaux Volees	3.57	4727N	7115W	1 1978	12 1980	D
72	du Sud	Arthurville	821	4682N	7075W	1 1978	9 1988	D
73	Saguenay	Centrale D'isle Maligne	73000	4858N	7163W	10 1913	12 1984	M
74	Peribonca	Centrale de Chute-A-La-Savane	26900	4875N	7183W	1 1966	12 1984	M
75	Petite Peribonca	en amont Route 169	1090	4880N	7203W	1 1978	9 1988	D
76	Petit-Saguenay	en amont Route 170	736	4818N	7005W	1 1978	9 1988	D
	Portneuf	en amont Des Chutes Philias	2010	4815N	6917W	1 1978	9 1988	D
	Rimouski	en amont Route 132	1590	4840N	6855W	1 1978	12 1980	D
	Aux Outardes	Centrale No.3	17900	4955N	6872W	1 1980	12 1984	M
	Aux Outardes	Centrale de Chute-Aux-Outardes	18900	4915N	6840W	9 1922	12 1979	M
	Manicouagan	Centrale No.2	45600	4933N	6835W	1 1980	11 1984	M
	Manicouagan	Centrale Mccormick	45800	4920N	6833W	1 1966	12 1979	M

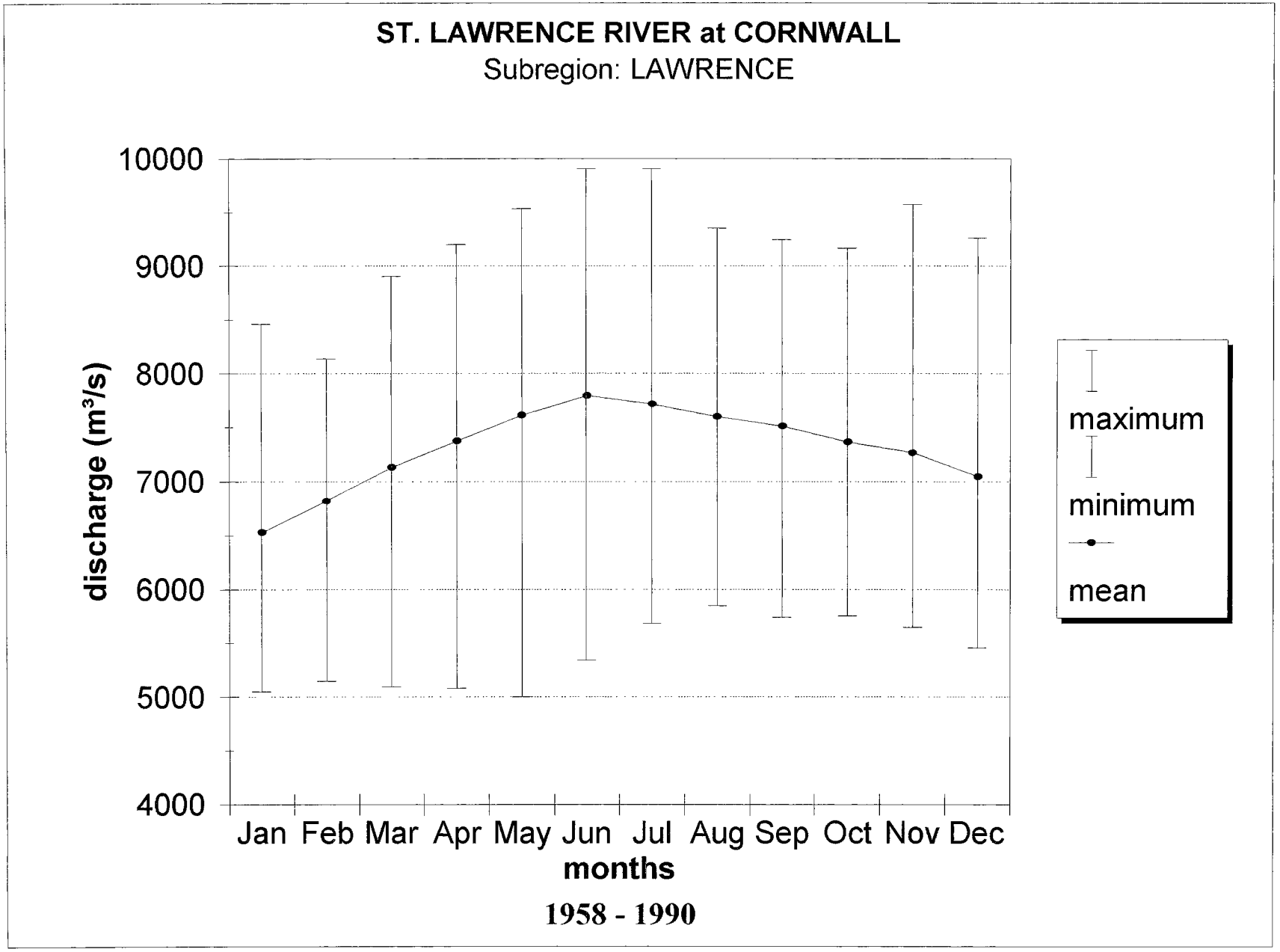
GLOBAL RUNOFF DATA CENTRE (GRDC)
20 LARGEST RIVERS

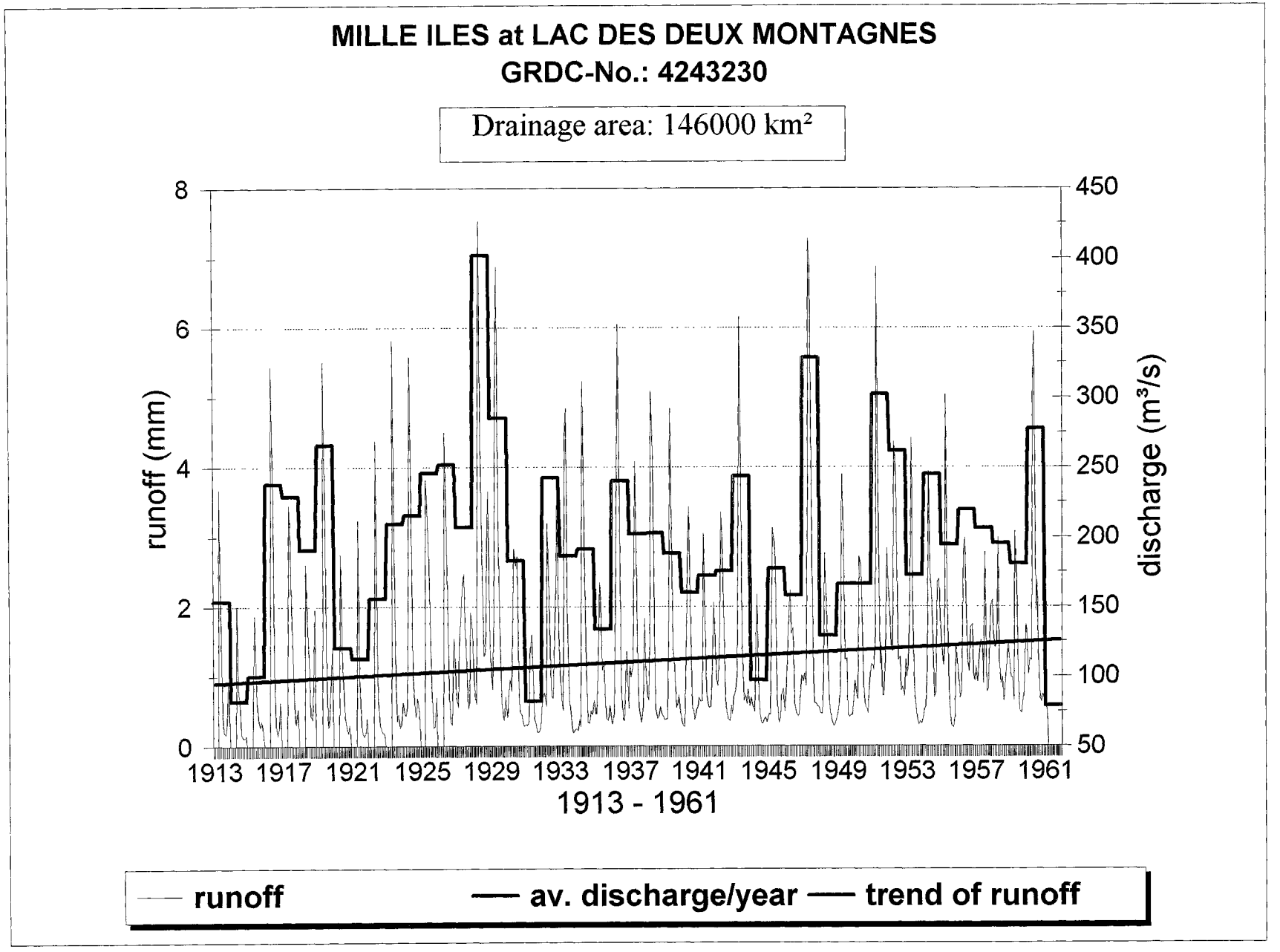
	LAWRENCE							table 4
No.	**River**	**Station**	**Area (km²)**	**Latitude**	**Longitude**	**first rec.**	**last rec.**	**day/month**
	Moisie	above Qnslr Bridge	19000	5035N	6618W	1 1966	12 1984	M
	Magpie	Sortie du Lac Magpie	7230	5068N	6457W	10 1978	12 1980	D
	Magpie	en amont Route 138	7590	5037N	6442W	1 1978	8 1979	D

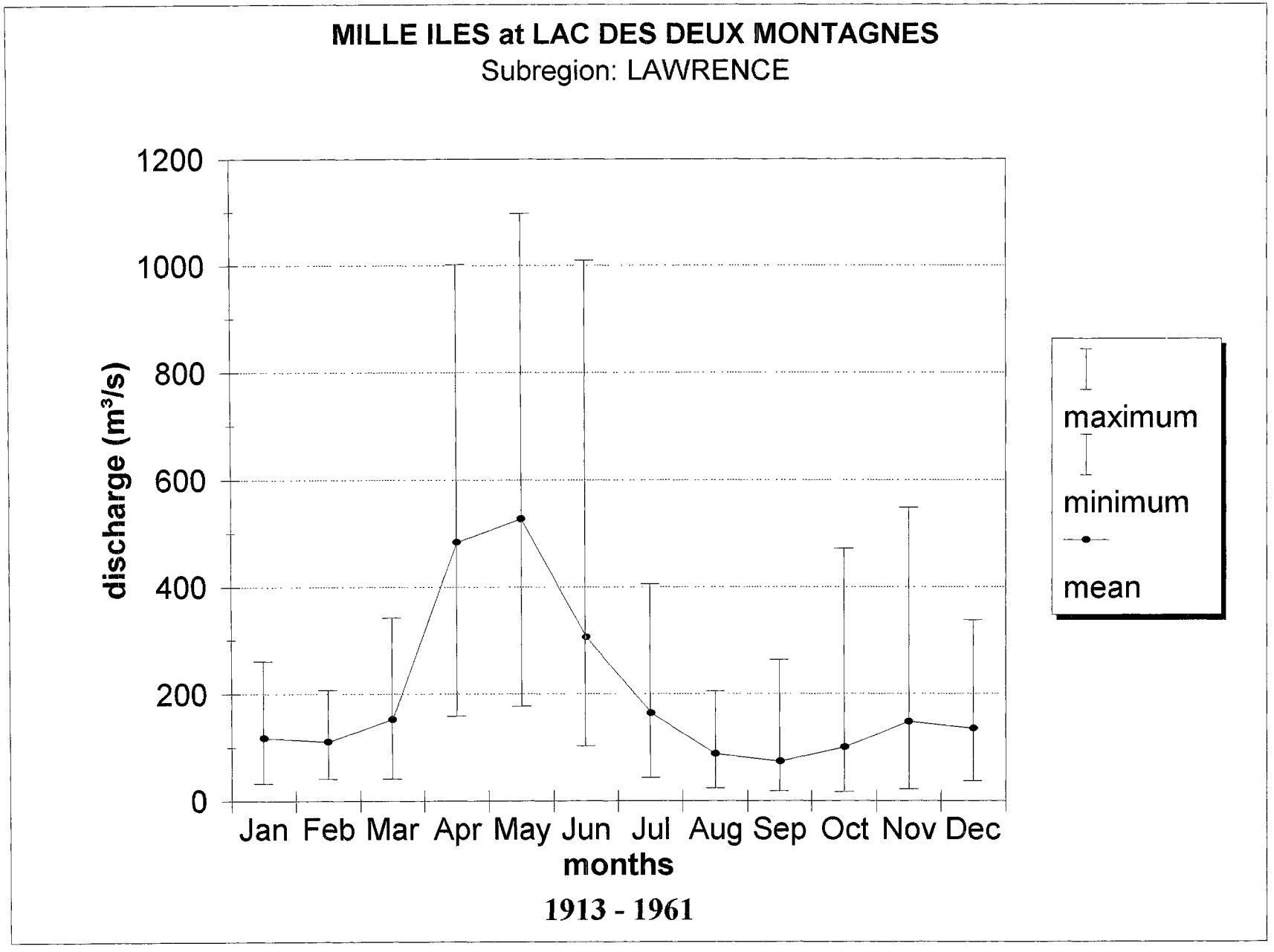

St. LAWRENCE at CORNWALL
GRDC-No.: 4143550
Drainage area: 774410 km²
runoff (mm)
discharge (m³/s)
14
12
10
8
6
4
2
0
8800
8600
8400
8200
8000
7800
7600
7400
7200
1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984
1973 - 1984
runoff
av. discharge/year
trend of runoff

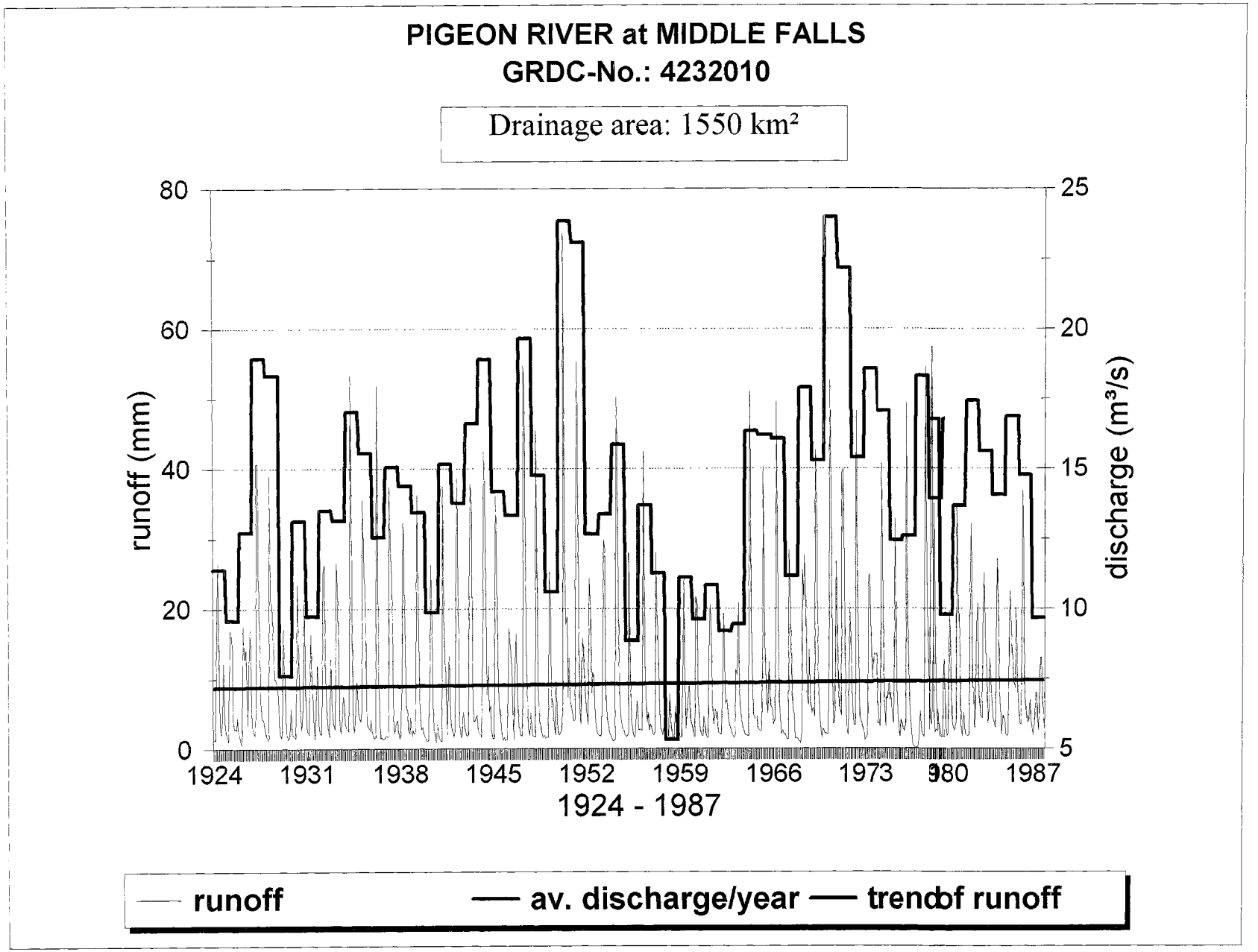

ST. LAWRENCE at CORNWALL, ONTARIO
Subregion: LAWRENCE
10000
9000
8000
7000
6000
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
maximum
minimum
mean
1973 - 1984

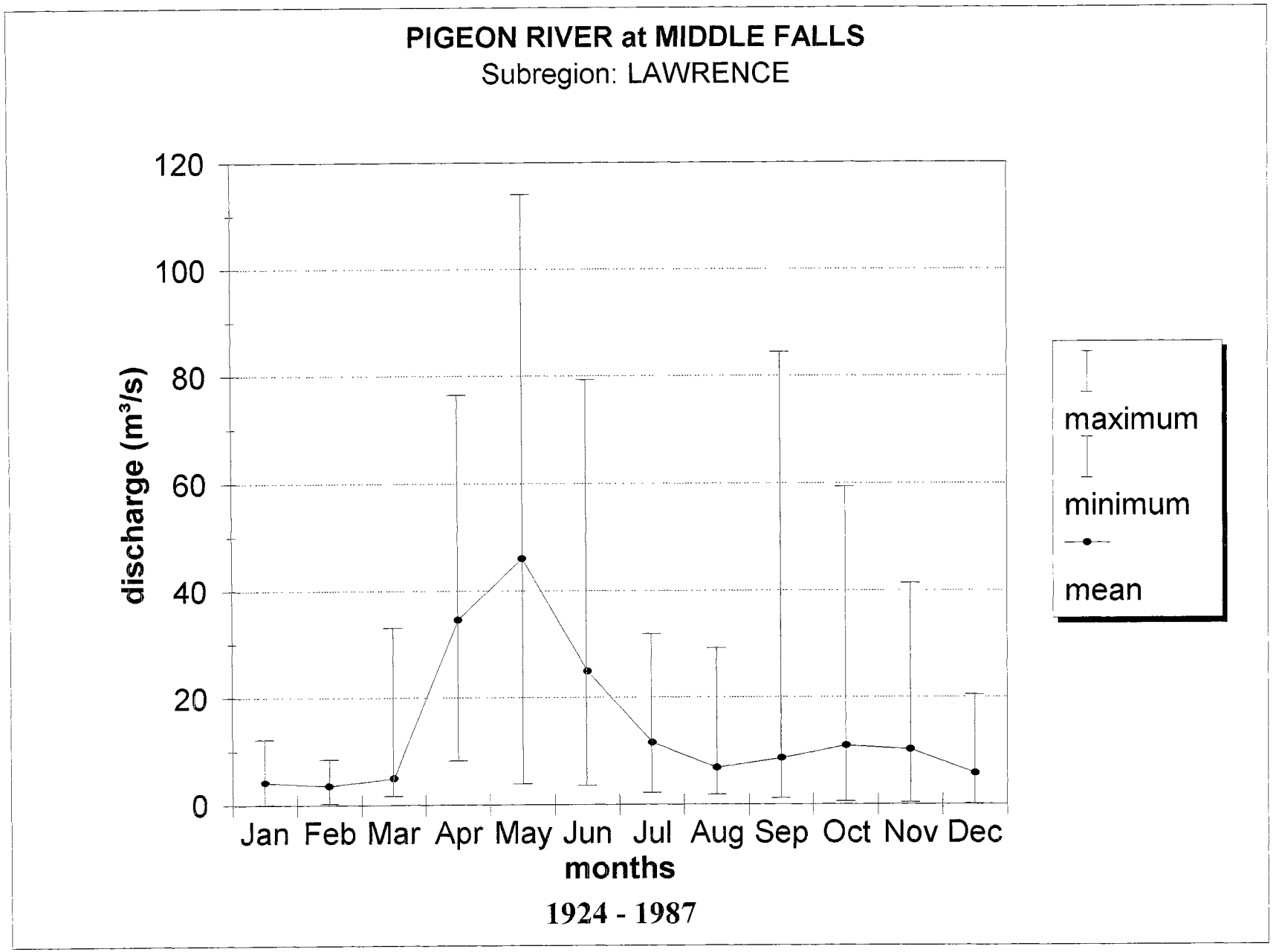

ST. LAWRENCE at CORNWALL
GRDC-No.: 4243150
Drainage area: 77400 km²
runoff (mm)
discharge (m³/s)
14
12
10
8
6
4
2
0
9000
8500
8000
7500
7000
6500
6000
5500
1958
1962
1966
1970
1974
1978
1982
1986
1990
1958 - 1990
runoff
av. discharge/year
trend of runoff

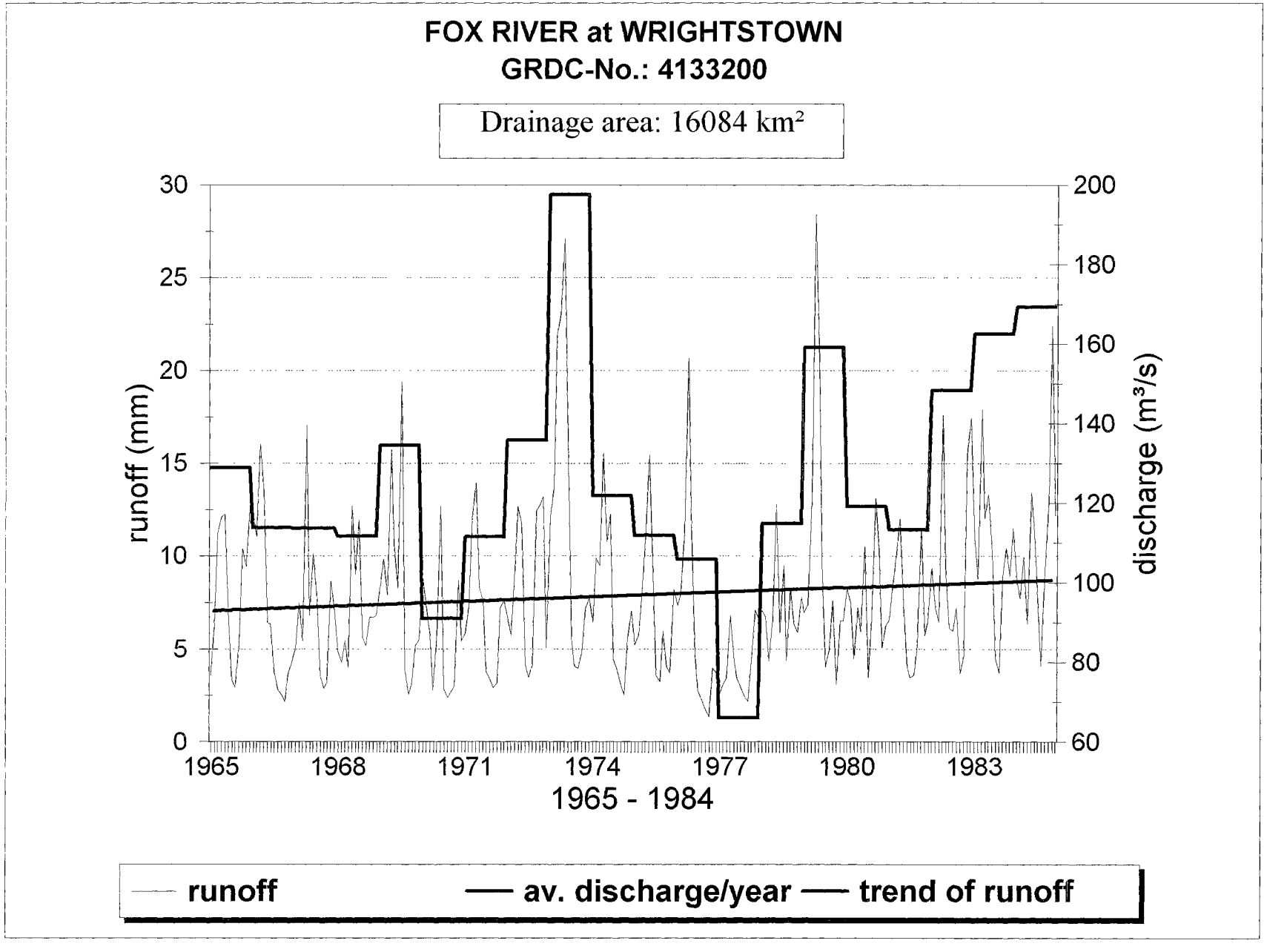

ST. LAWRENCE RIVER at CORNWALL
Subregion: LAWRENCE
10000
9000
8000
7000
6000
5000
4000
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1958 - 1990
maximum
minimum
mean

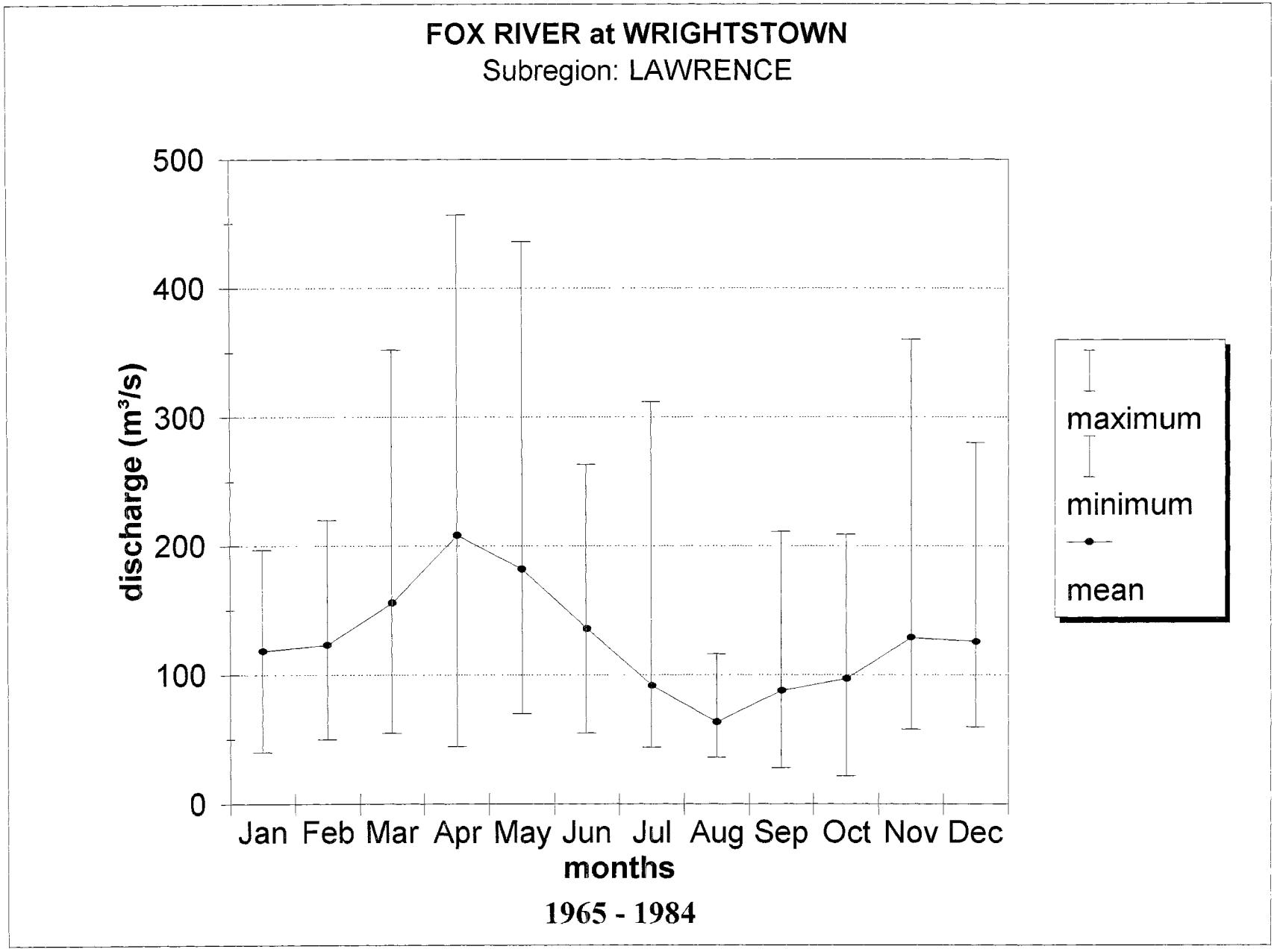

MILLE ILES at LAC DES DEUX MONTAGNES
GRDC-No.: 4243230
Drainage area: 146000 km²
runoff (mm)
discharge (m³/s)
0
2
4
6
8
50
100
150
200
250
300
350
400
450
1913 1917 1921 1925 1929 1933 1937 1941 1945 1949 1953 1957 1961
1913 - 1961
runoff
av. discharge/year
trend of runoff

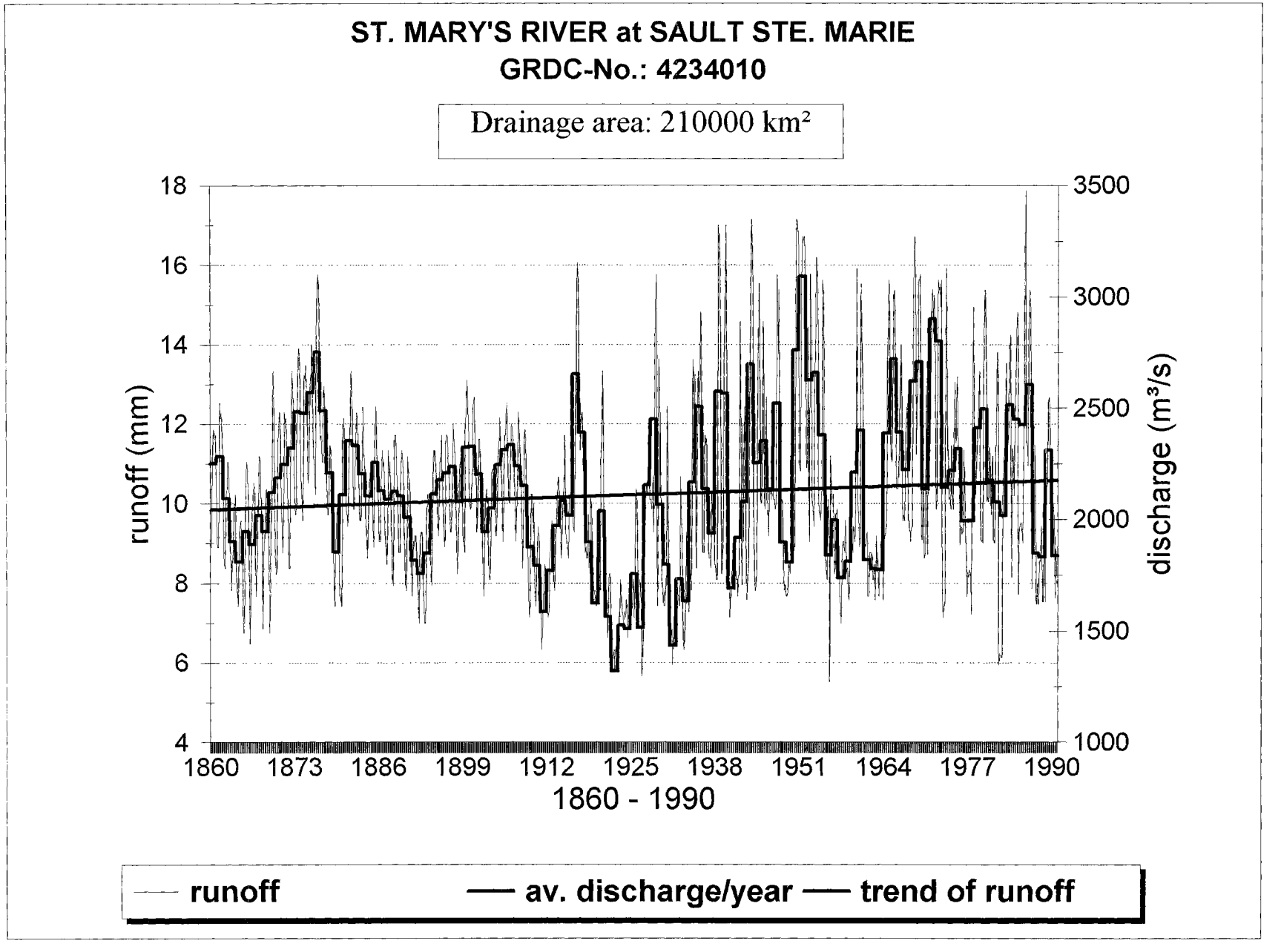

MILLE ILES at LAC DES DEUX MONTAGNES
Subregion: LAWRENCE
1200
1000
800
600
400
200
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
maximum
minimum
mean
1913 - 1961

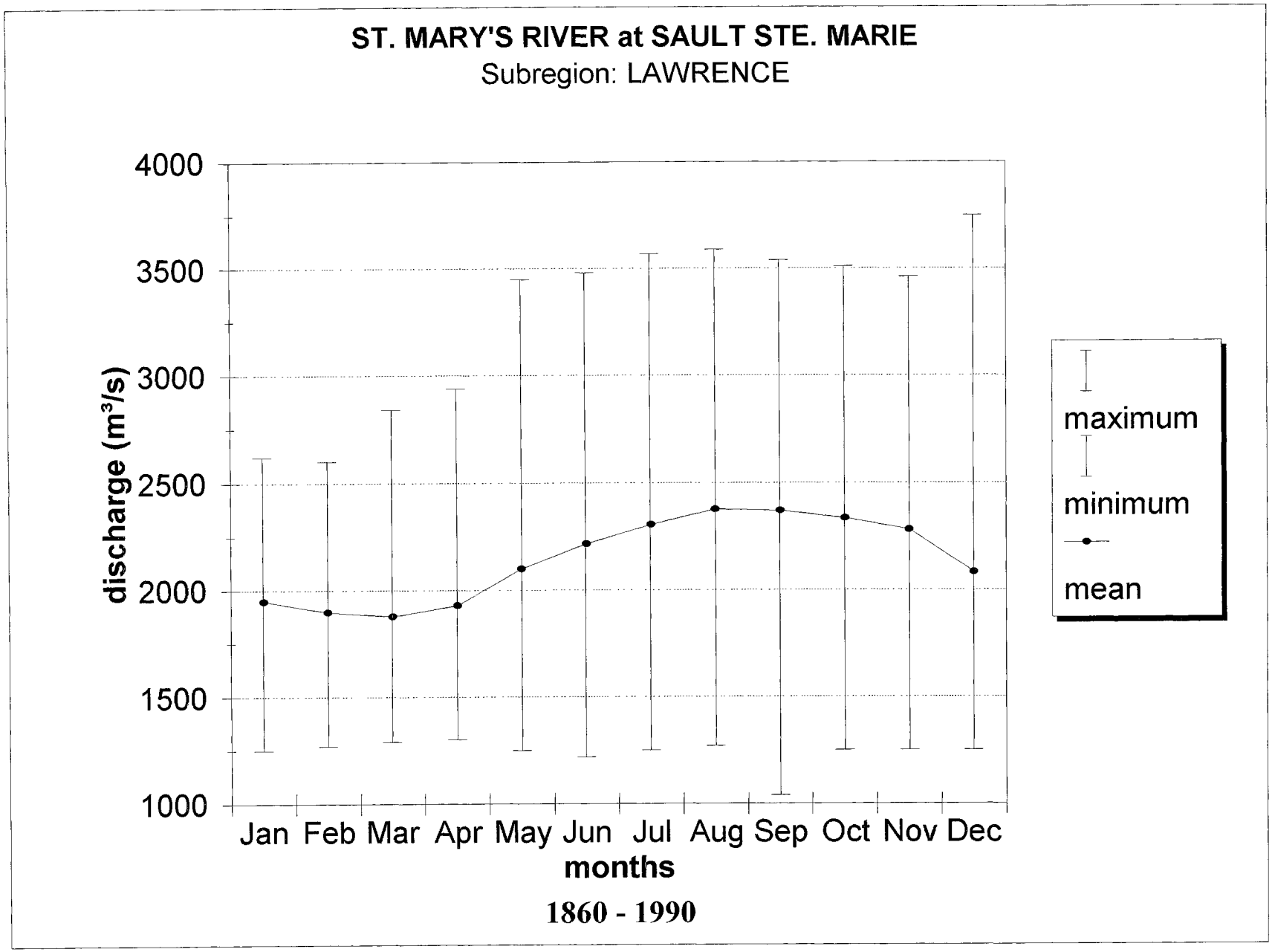

PIGEON RIVER at MIDDLE FALLS
GRDC-No.: 4232010
Drainage area: 1550 km²
runoff (mm)
discharge (m³/s)
80
60
40
20
0
25
20
15
10
5
1924
1931
1938
1945
1952
1959
1966
1973
1980
1987
1924 - 1987
runoff
av. discharge/year
trend of runoff

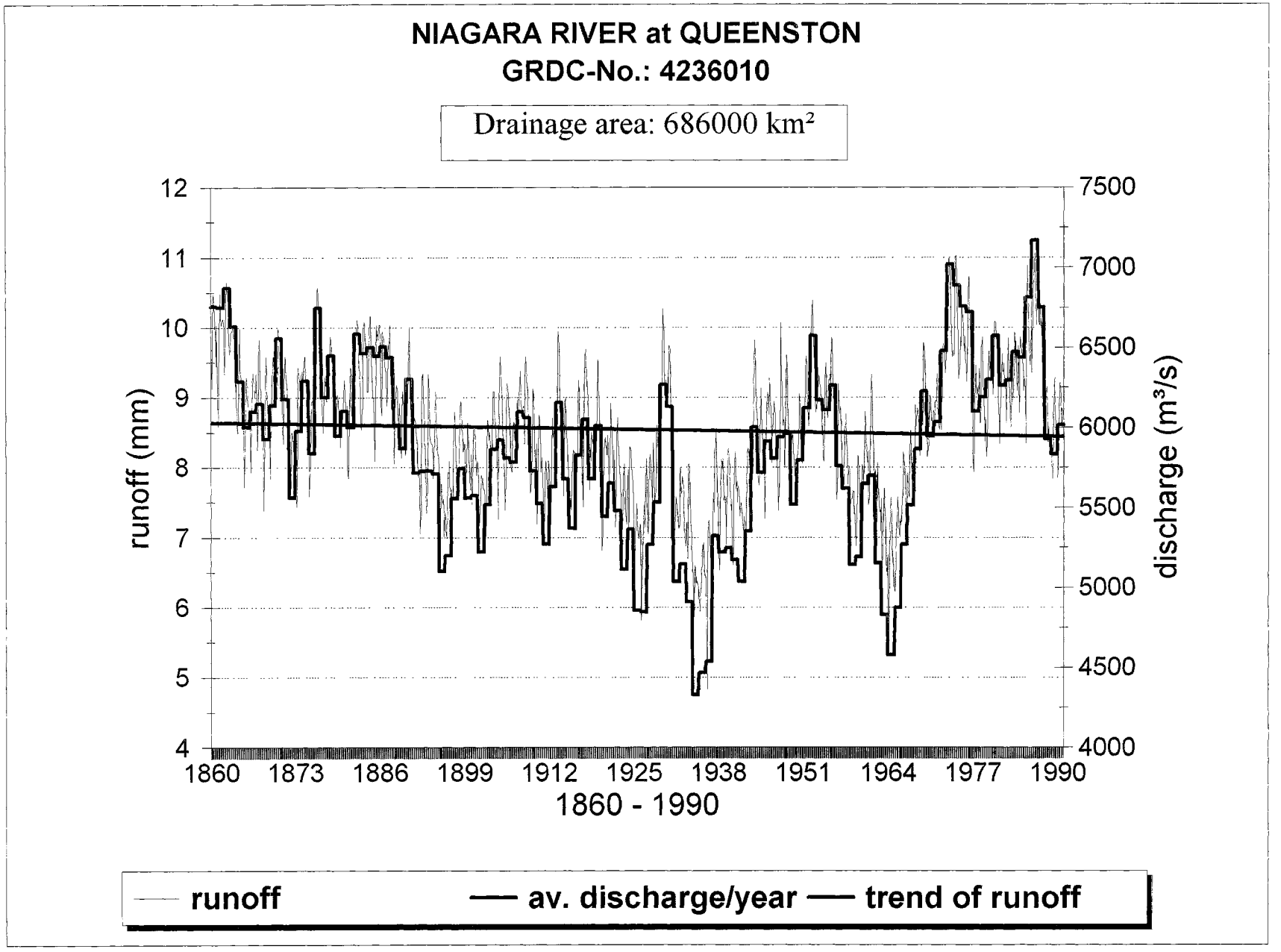

PIGEON RIVER at MIDDLE FALLS
Subregion: LAWRENCE
120
100
80
60
40
20
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
maximum
minimum
mean
1924 - 1987

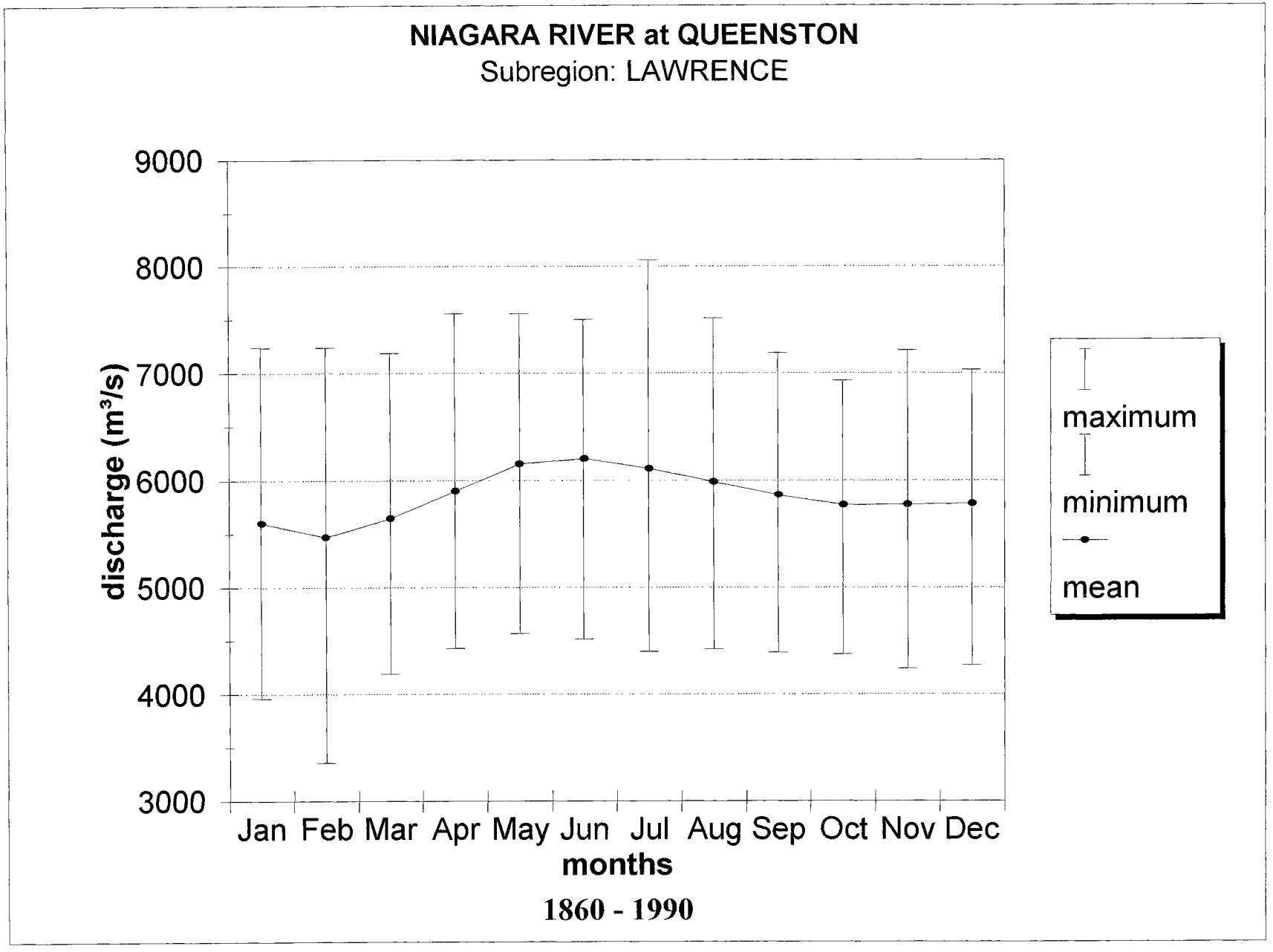

FOX RIVER at WRIGHTSTOWN
GRDC-No.: 4133200
Drainage area: 16084 km²
runoff (mm)
discharge (m³/s)
30
25
20
15
10
5
0
200
180
160
140
120
100
80
60
1965
1968
1971
1974
1977
1980
1983
1965 - 1984
runoff
av. discharge/year
trend of runoff

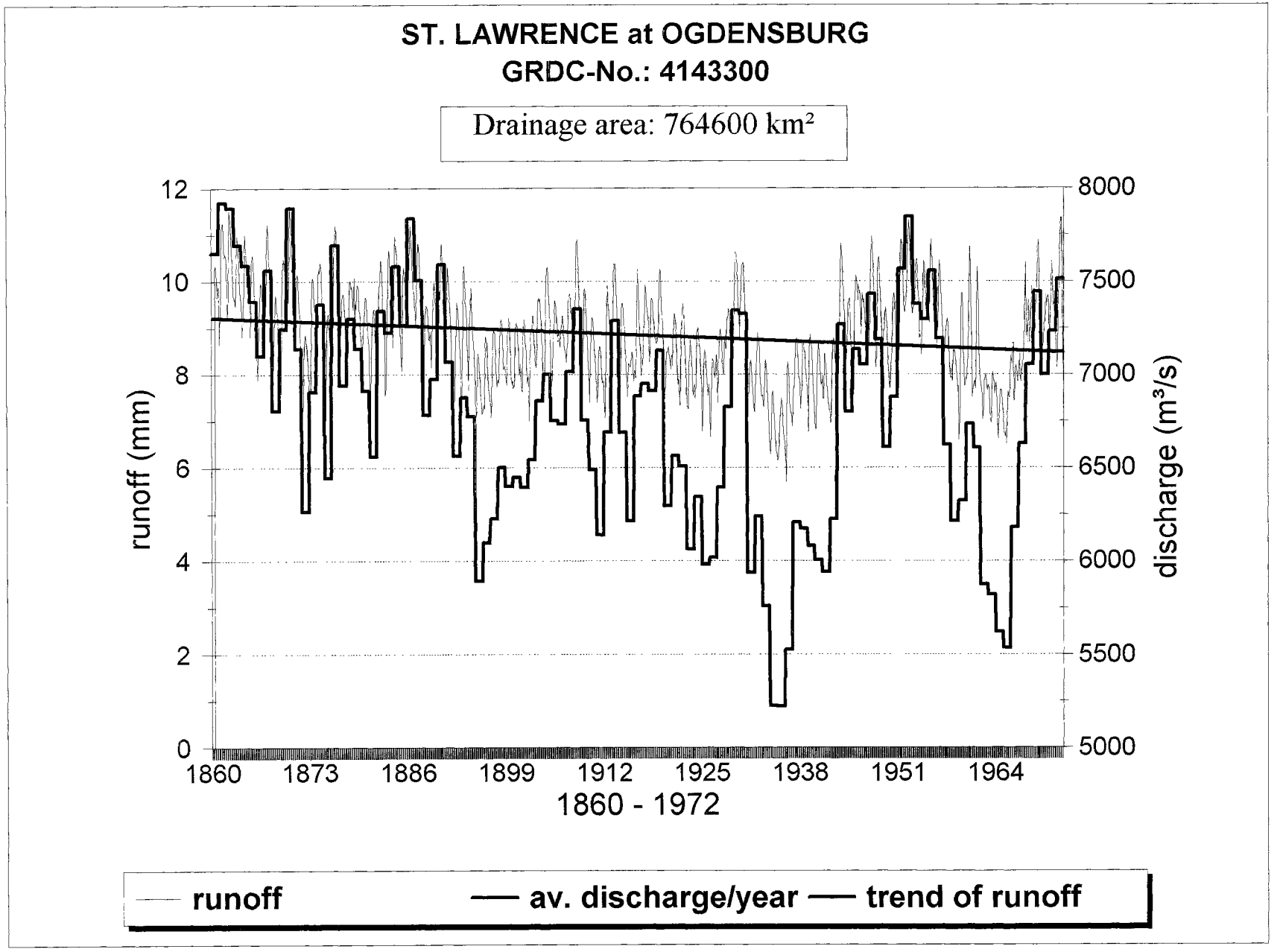

FOX RIVER at WRIGHTSTOWN
Subregion: LAWRENCE
500
400
300
200
100
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1965 - 1984
maximum
minimum
mean

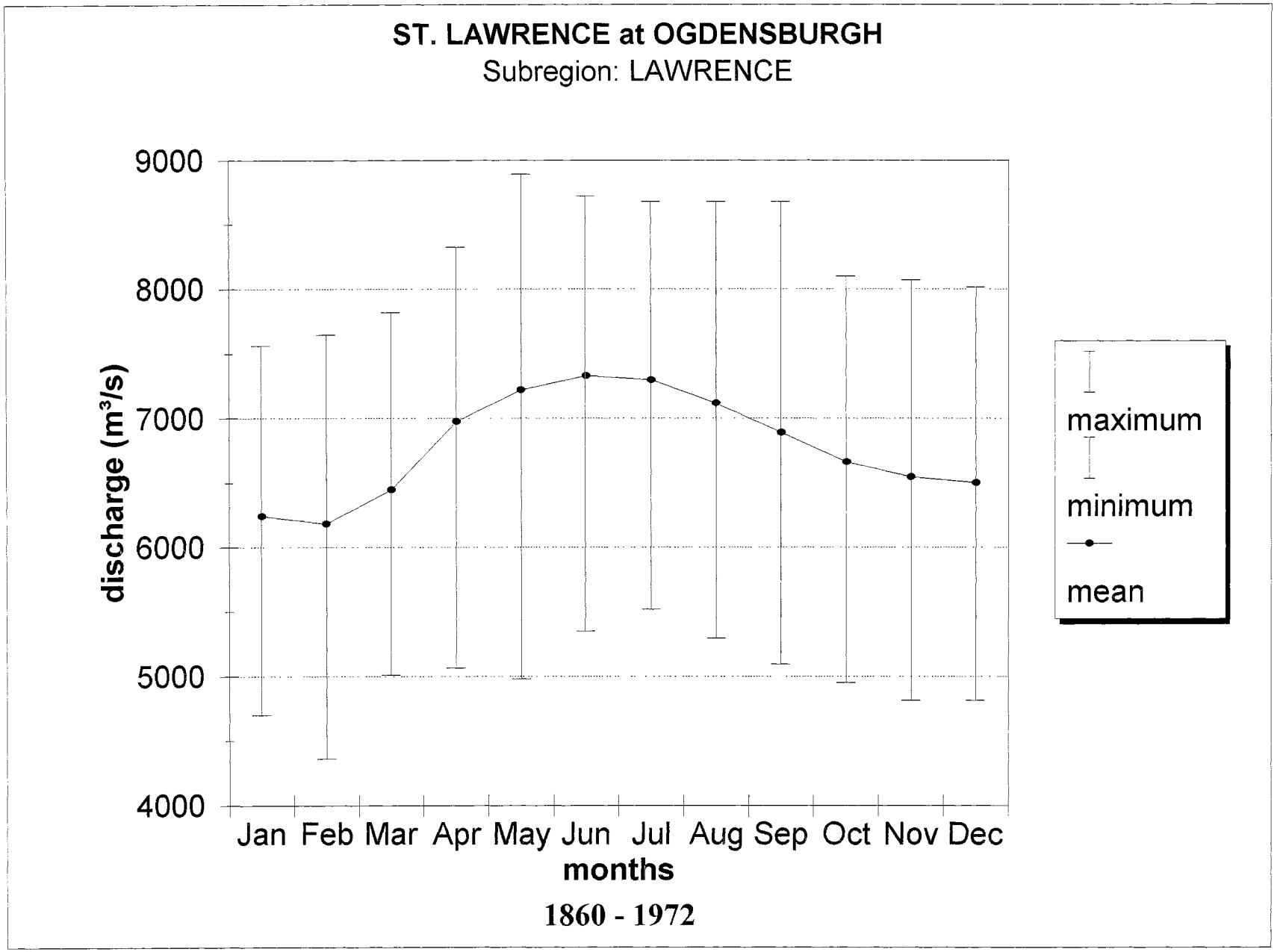

ST. MARY'S RIVER at SAULT STE. MARIE
GRDC-No.: 4234010
Drainage area: 210000 km²
runoff (mm)
discharge (m³/s)
18
16
14
12
10
8
6
4
3500
3000
2500
2000
1500
1000
1860 1873 1886 1899 1912 1925 1938 1951 1964 1977 1990
1860 - 1990
runoff
av. discharge/year
trend of runoff

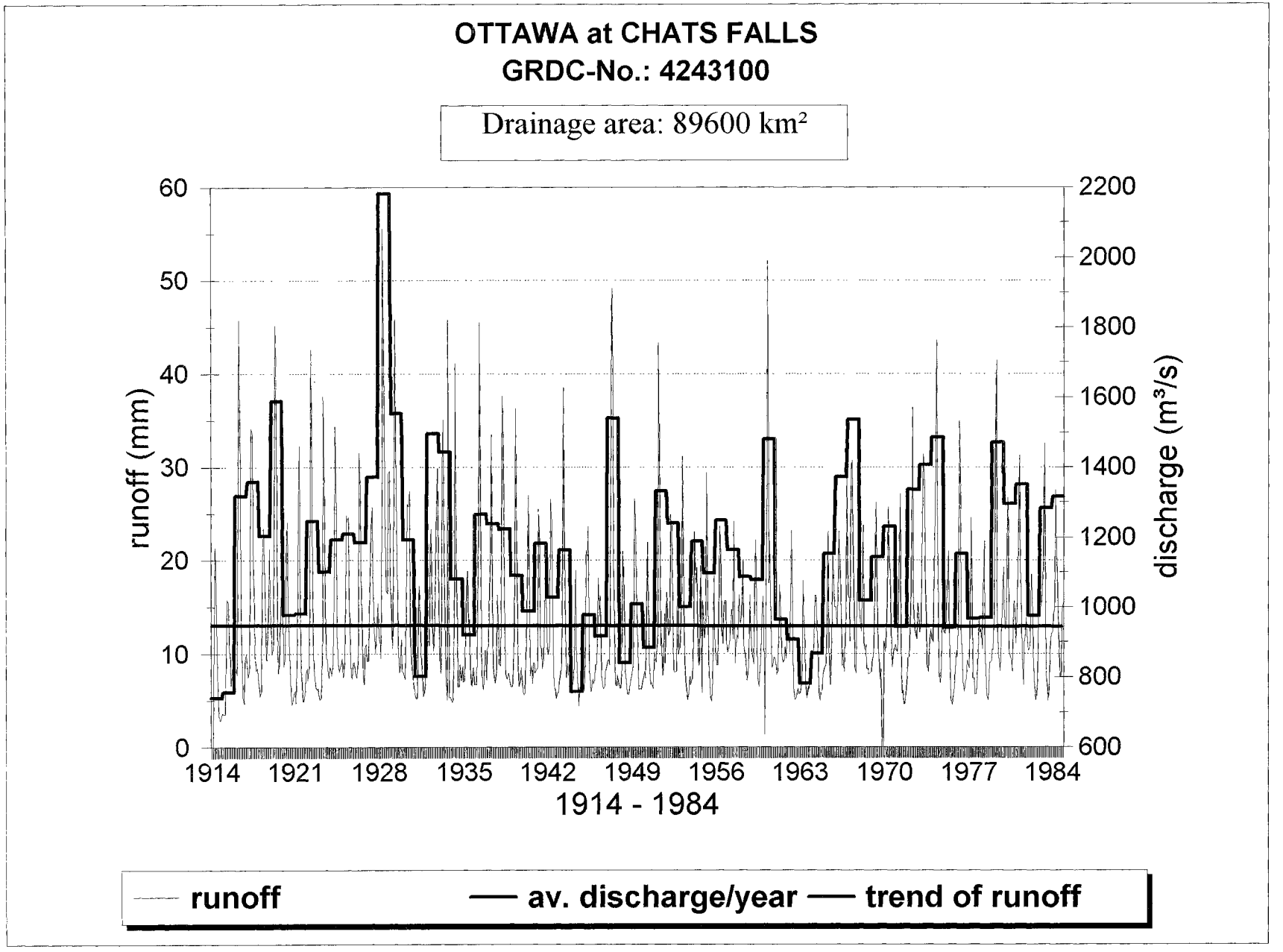

ST. MARY'S RIVER at SAULT STE. MARIE
Subregion: LAWRENCE
4000
3500
3000
2500
2000
1500
1000
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
maximum
minimum
mean
1860 - 1990

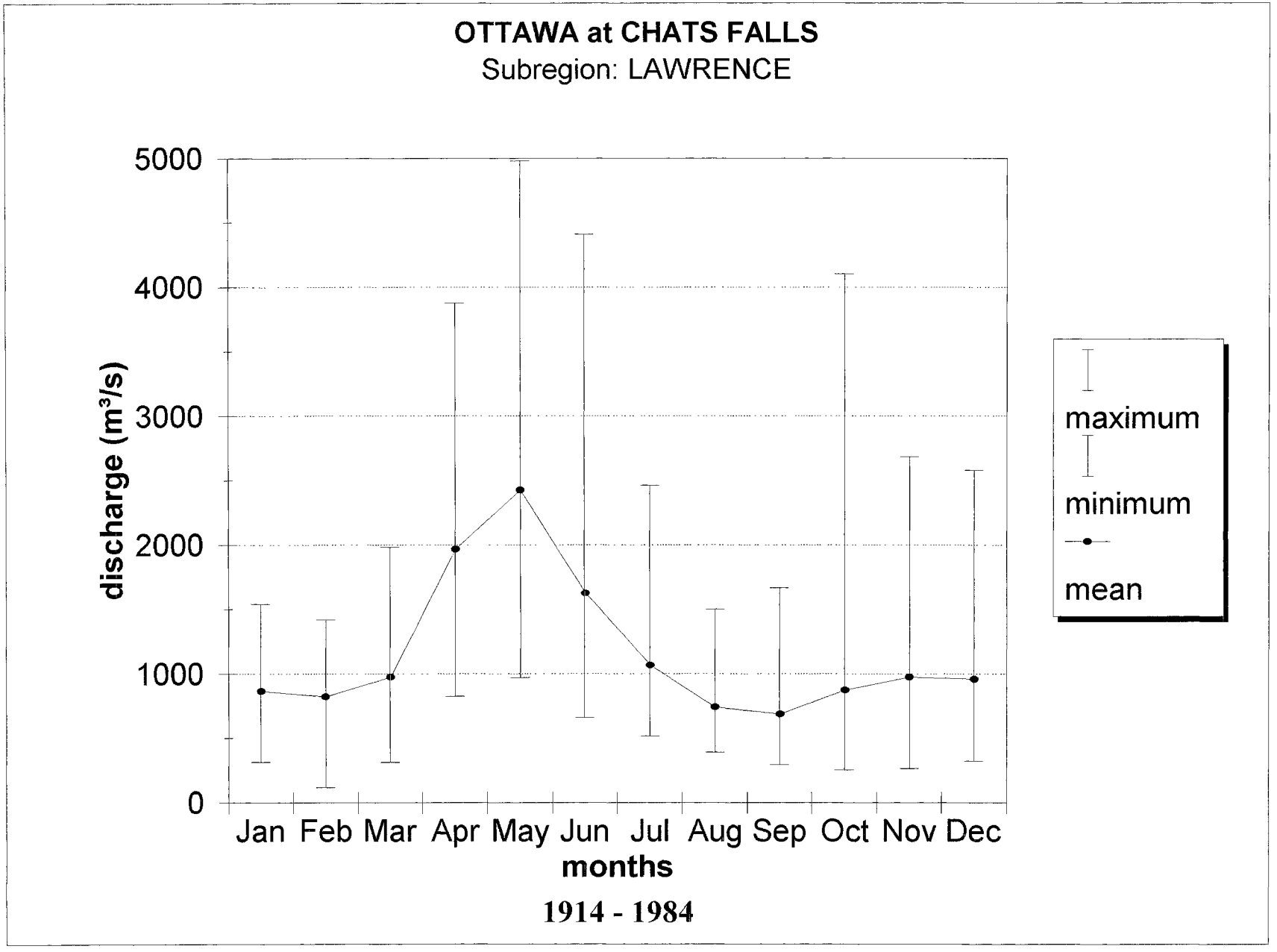

NIAGARA RIVER at QUEENSTON
GRDC-No.: 4236010
Drainage area: 686000 km²
runoff (mm)
discharge (m³/s)
12
11
10
9
8
7
6
5
4
7500
7000
6500
6000
5500
5000
4500
4000
1860
1873
1886
1899
1912
1925
1938
1951
1964
1977
1990
1860 - 1990
runoff
av. discharge/year
trend of runoff


NIAGARA RIVER at QUEENSTON
Subregion: LAWRENCE
9000
8000
7000
6000
5000
4000
3000
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1860 - 1990
maximum
minimum
mean


ST. LAWRENCE at OGDENSBURG
GRDC-No.: 4143300
Drainage area: 764600 km²
runoff (mm)
discharge (m³/s)
0
2
4
6
8
10
12
5000
5500
6000
6500
7000
7500
8000
1860
1873
1886
1899
1912
1925
1938
1951
1964
1860 - 1972
runoff
av. discharge/year
trend of runoff


ST. LAWRENCE at OGDENSBURGH
Subregion: LAWRENCE
9000
8000
7000
6000
5000
4000
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
maximum
minimum
mean
1860 - 1972

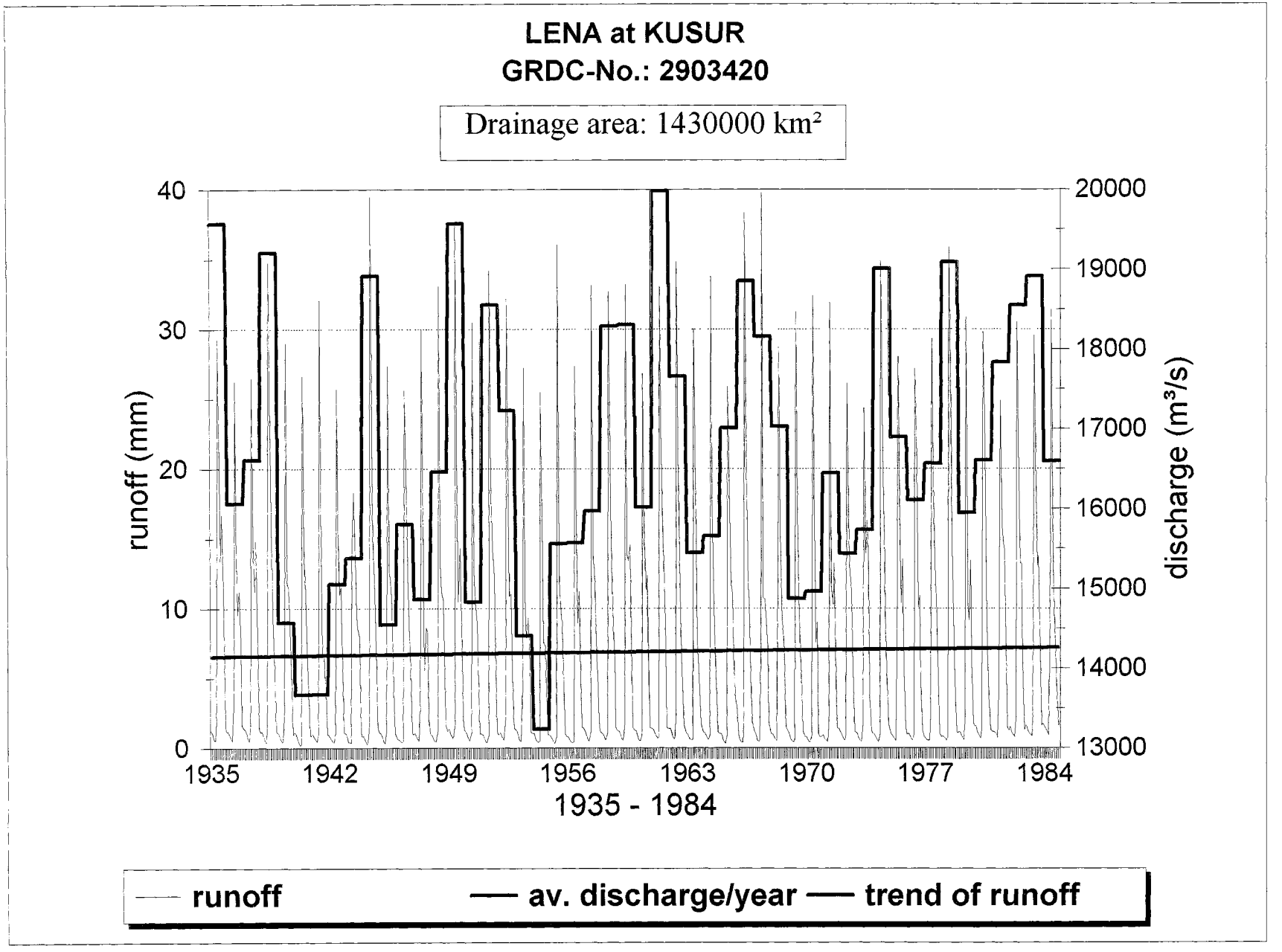

OTTAWA at CHATS FALLS
GRDC-No.: 4243100
Drainage area: 89600 km²
runoff (mm)
discharge (m³/s)
60
50
40
30
20
10
0
2200
2000
1800
1600
1400
1200
1000
800
600
1914
1921
1928
1935
1942
1949
1956
1963
1970
1977
1984
1914 - 1984
runoff
av. discharge/year
trend of runoff

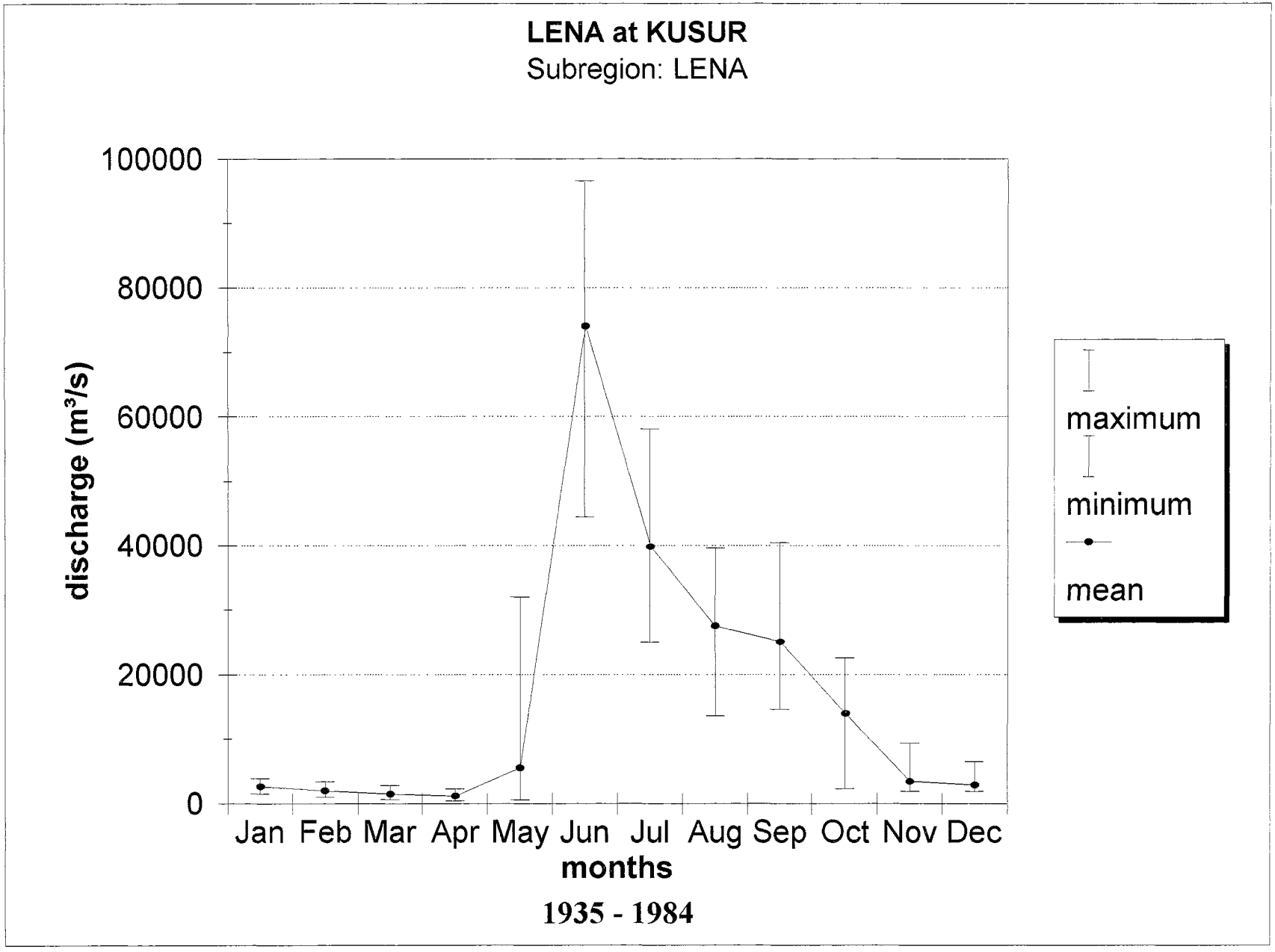

OTTAWA at CHATS FALLS
Subregion: LAWRENCE
5000
4000
3000
2000
1000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1914 - 1984
maximum
minimum
mean

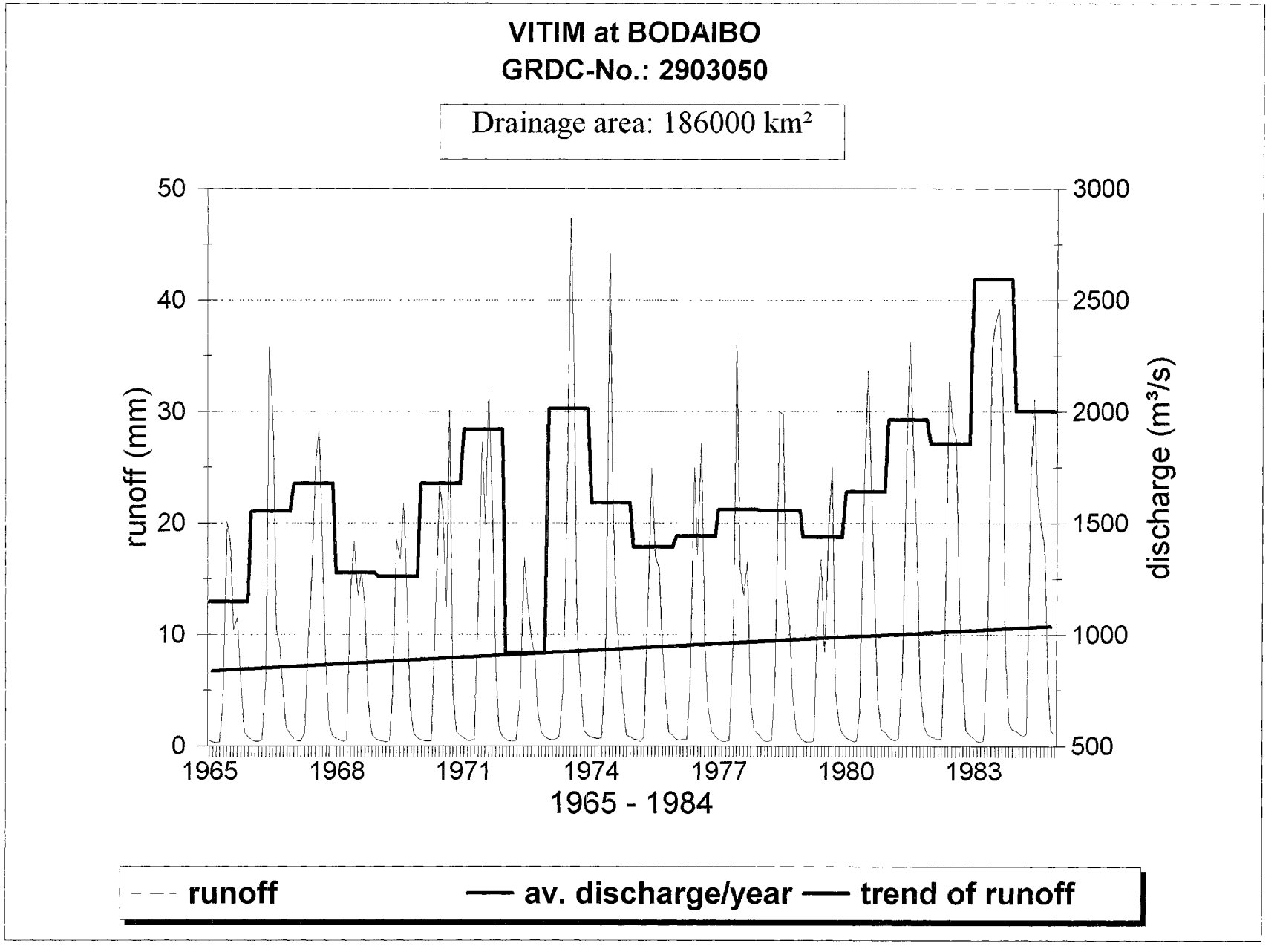
LENA BASIN
GRDC - Stations
8
10
2
5
3
1
4

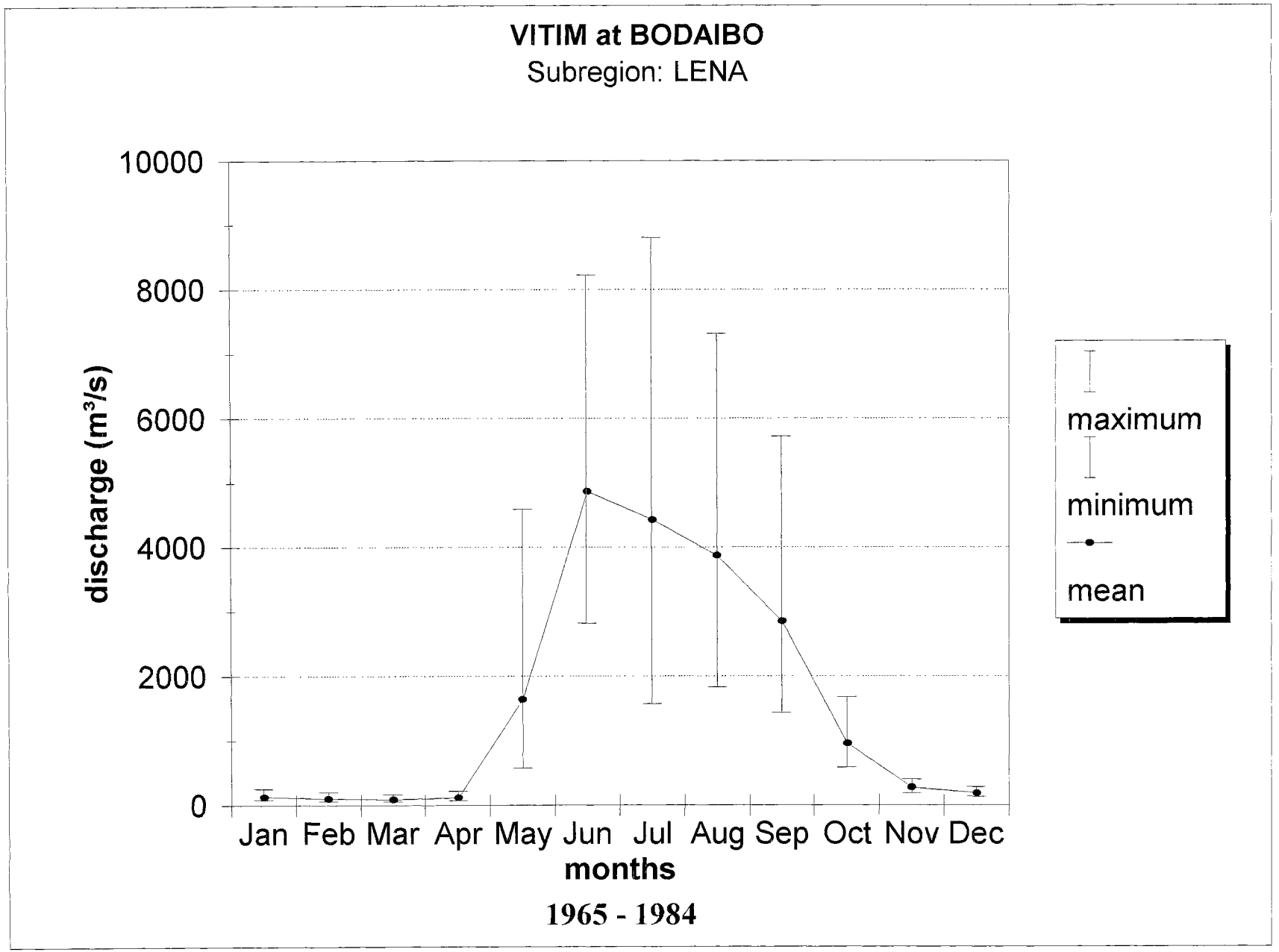
GLOBAL RUNOFF DATA CENTRE (GRDC)
20 LARGEST RIVERS

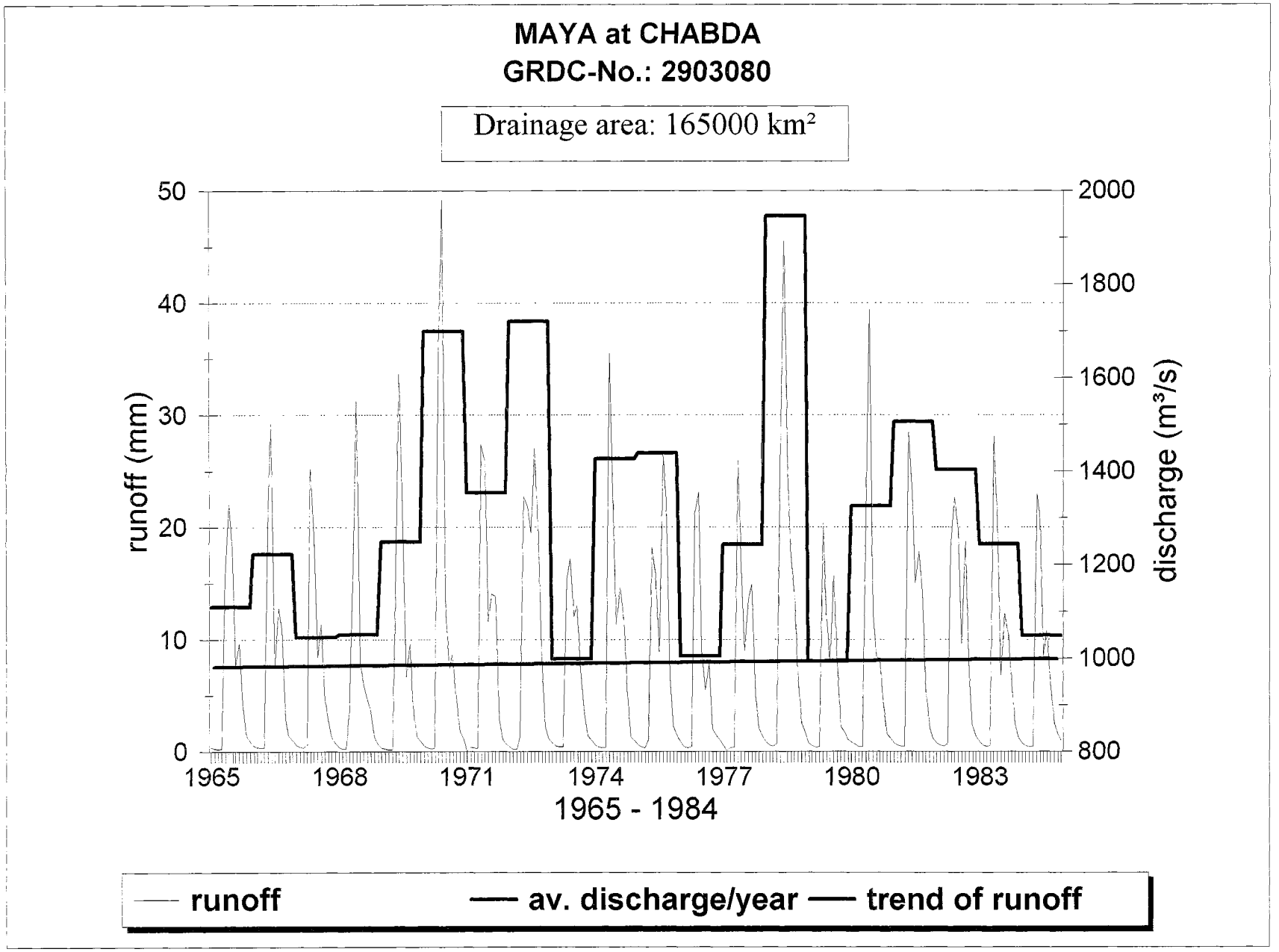
	LENA							
No.	River	Station	Area (km²)	Latitude	Longitude	first rec.	last rec.	day/month
1	Vitim	Bodaibo	186000	5790N	11425E	1 1965	12 1984	M
2	Maya	Chabda	165000	5975N	13475E	1 1965	12 1984	M
3	Zhuya	Svetly	4790	5844N	11614E	1 1978	12 1987	D
4	Anabar	Saskylakh	78800	7198N	11395E	1 1966	12 1984	M
5	Kempendai	Kempendai	1290	6191N	11868E	1 1978	12 1987	D
6	Kirenga	Shorokhovo	46500	5767N	10807E	1 1965	12 1984	M
7	Timpton	Nagorny	613	5598N	12475E	1 1978	12 1987	D
	Iya	Tulun	14500	5477N	10065E	1 1965	12 1984	M
8	**Lena**	**Kusur**	**1430000**	**7070N**	**12765E**	**1 1935**	**12 1984**	**M**
9	Ebitiem	Ebetem	1000	7036N	12795E	1 1980	12 1987	D
10	Kenkeme	Vtoroy Stanok	3550	6206N	12903E	1 1978	12 1987	D
	Tuba	Bugurtak	31800	5377N	9277E	1 1965	12 1984	M
	Chaptakhai	mouth	28.4			1 1978	12 1987	D
	Radio-Uruyete	near The mouth	22.8			1 1978	12 1987	D
	Podgornyi	near The mouth	20.3			1 1978	12 1987	D
	Buor-Iuryakh	Kujdusun	743			1 1978	12 1987	D
	Malaya Cherepanikha	Tiube	469			1 1978	12 1987	D
	Shestakovka	Kamyrdagystakh	170			1 1978	12 1987	D

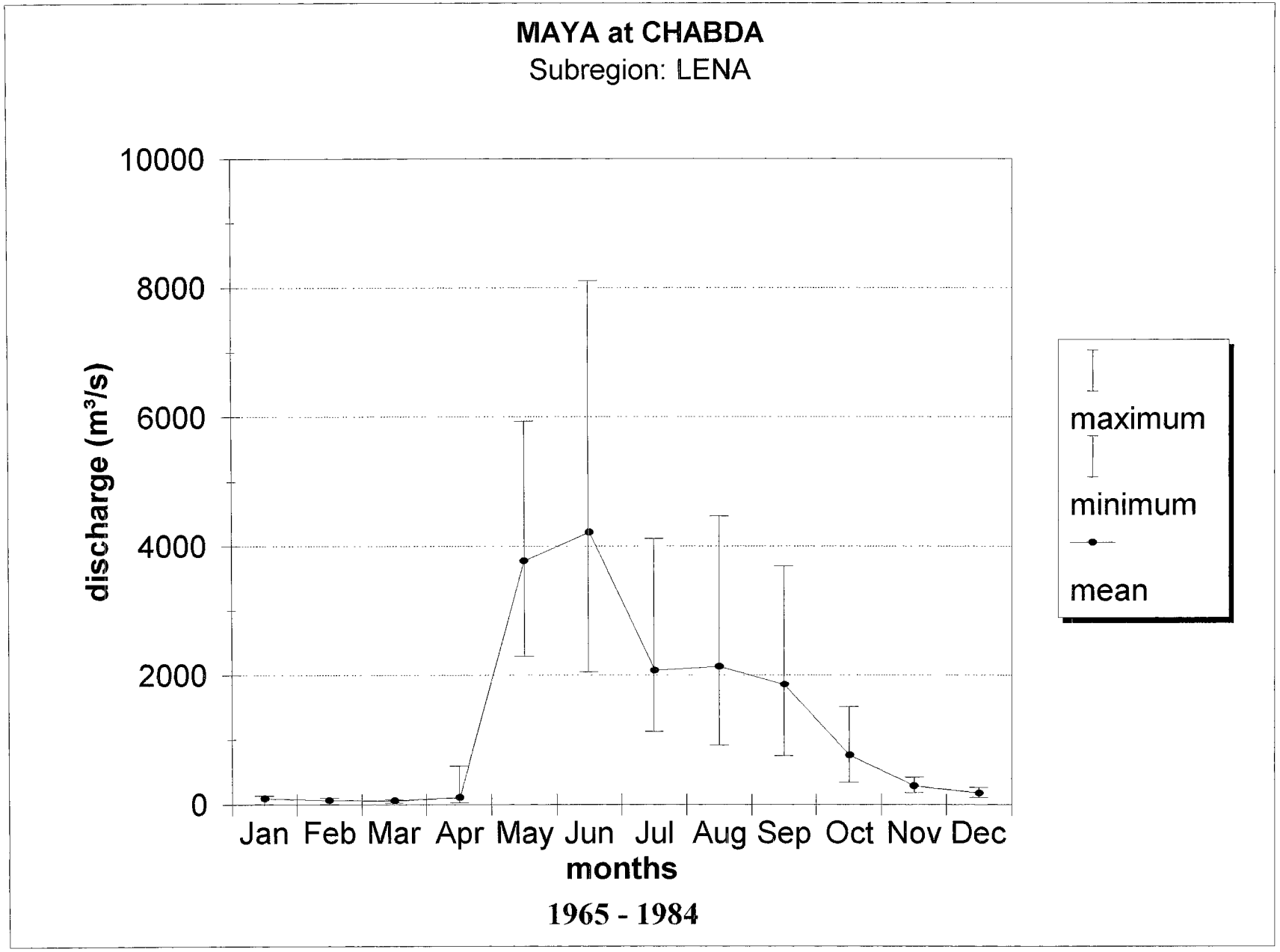

LENA at KUSUR
GRDC-No.: 2903420
Drainage area: 1430000 km²
runoff (mm)
discharge (m³/s)
0
10
20
30
40
13000
14000
15000
16000
17000
18000
19000
20000
1935
1942
1949
1956
1963
1970
1977
1984
1935 - 1984
runoff
av. discharge/year
trend of runoff

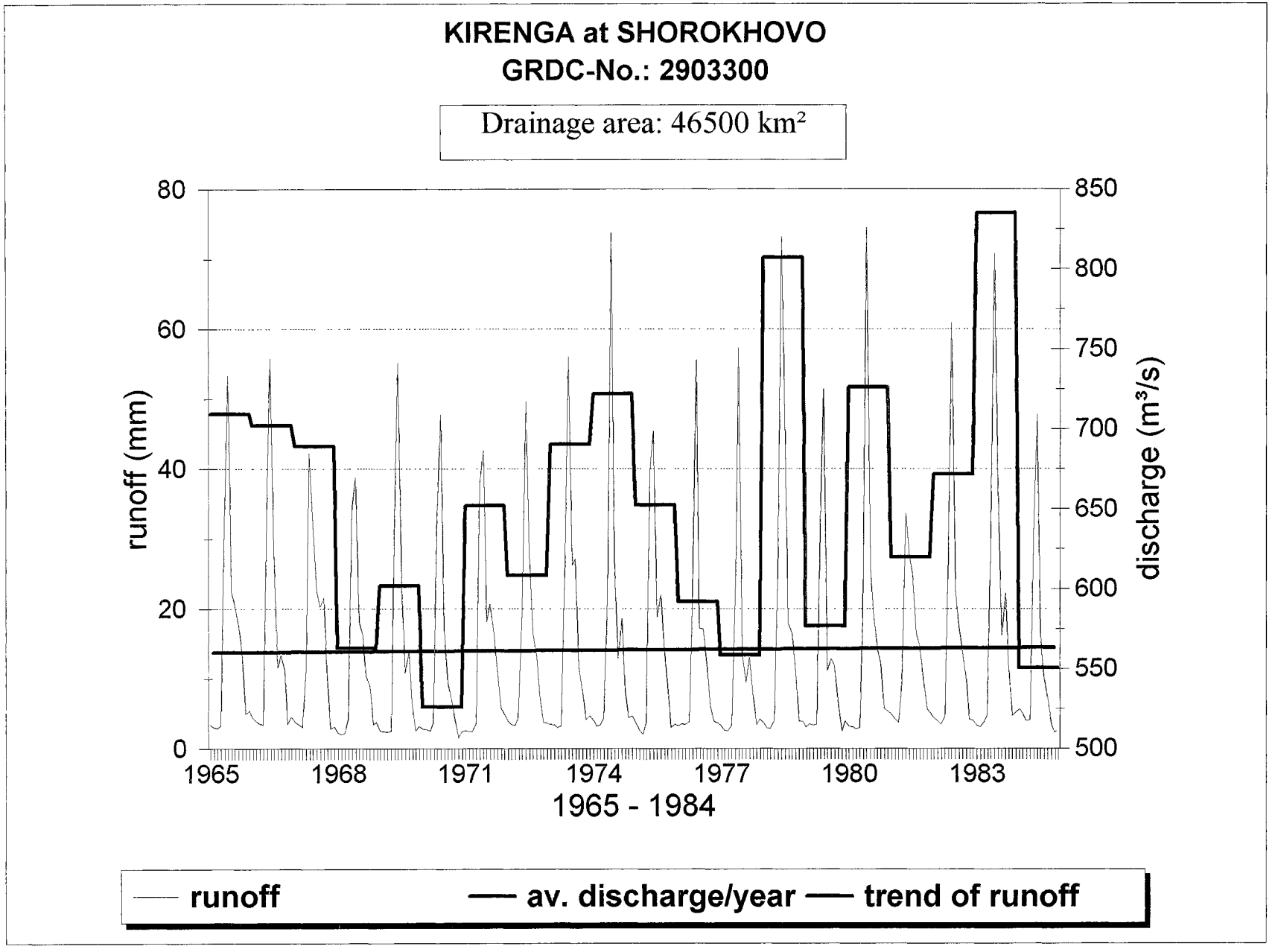

LENA at KUSUR
Subregion: LENA
100000
80000
60000
40000
20000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
maximum
minimum
mean
1935 - 1984

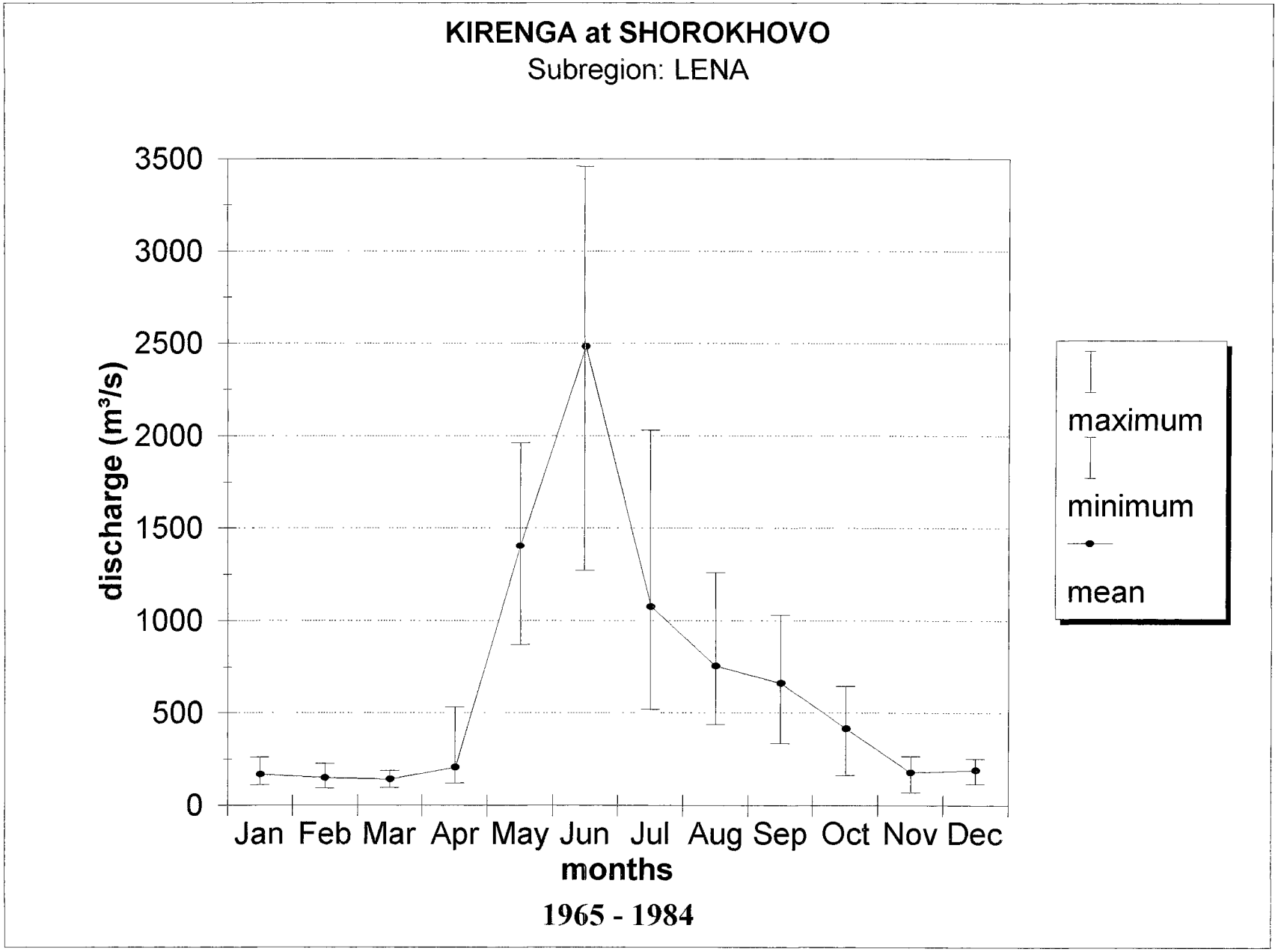

VITIM at BODAIBO
GRDC-No.: 2903050
Drainage area: 186000 km²
runoff (mm)
discharge (m³/s)
50
40
30
20
10
0
3000
2500
2000
1500
1000
500
1965
1968
1971
1974
1977
1980
1983
1965 - 1984
runoff
av. discharge/year
trend of runoff

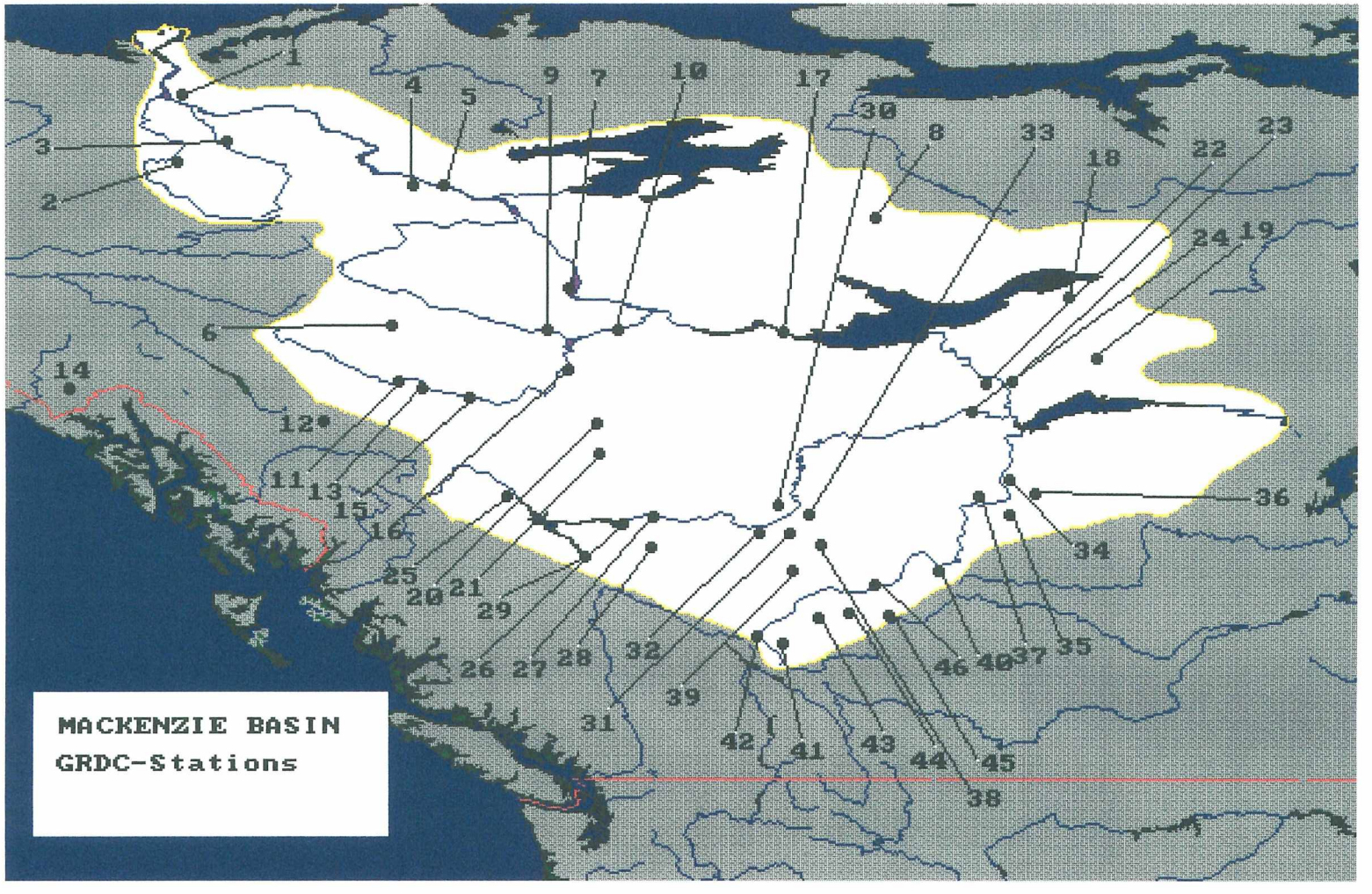

VITIM at BODAIBO
Subregion: LENA
10000
8000
6000
4000
2000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
maximum
minimum
mean
1965 - 1984


MAYA at CHABDA
GRDC-No.: 2903080
Drainage area: 165000 km²
runoff (mm)
discharge (m³/s)
0
10
20
30
40
50
800
1000
1200
1400
1600
1800
2000
1965
1968
1971
1974
1977
1980
1983
1965 - 1984
runoff
av. discharge/year
trend of runoff


MAYA at CHABDA
Subregion: LENA
10000
8000
6000
4000
2000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
maximum
minimum
mean
1965 - 1984


KIRENGA at SHOROKHOVO
GRDC-No.: 2903300
Drainage area: 46500 km²
runoff (mm)
discharge (m³/s)
0
20
40
60
80
500
550
600
650
700
750
800
850
1965
1968
1971
1974
1977
1980
1983
1965 - 1984
runoff
av. discharge/year
trend of runoff


KIRENGA at SHOROKHOVO
Subregion: LENA
discharge (m³/s)
3500
3000
2500
2000
1500
1000
500
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1965 - 1984
maximum
minimum
mean

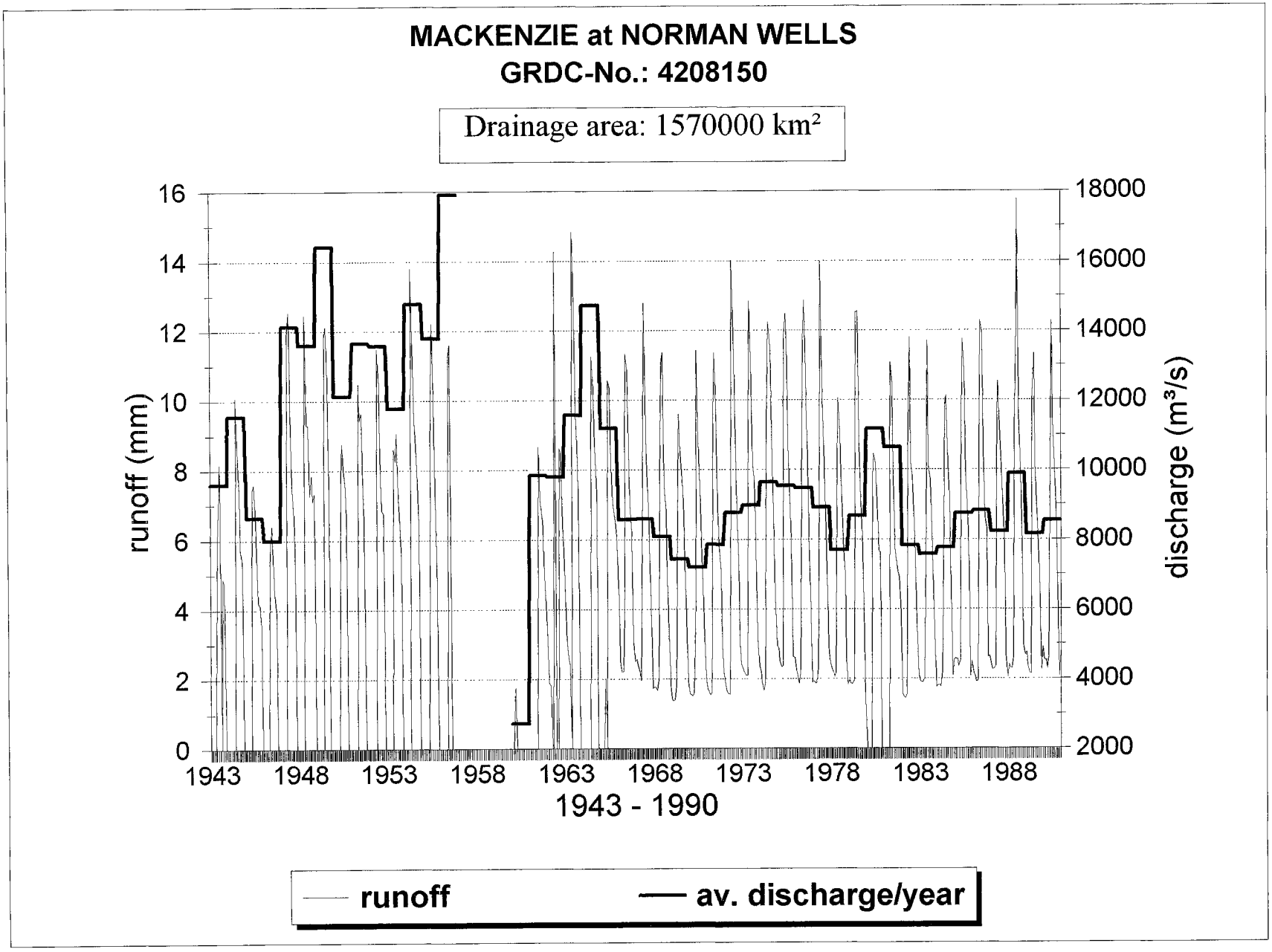

MACKENZIE BASIN
GRDC-Stations
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46

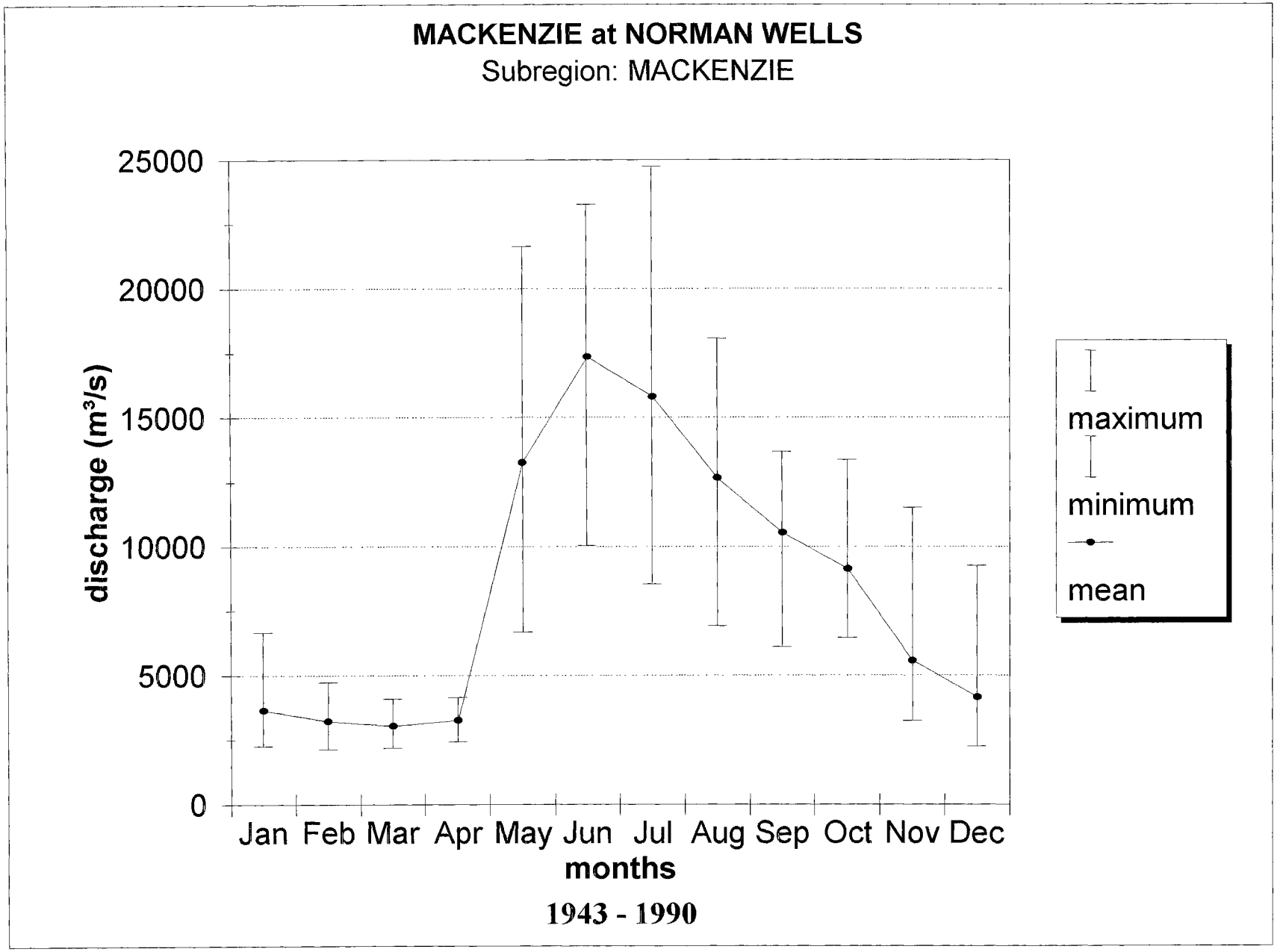
GLOBAL RUNOFF DATA CENTRE (GRDC)
20 LARGEST RIVERS

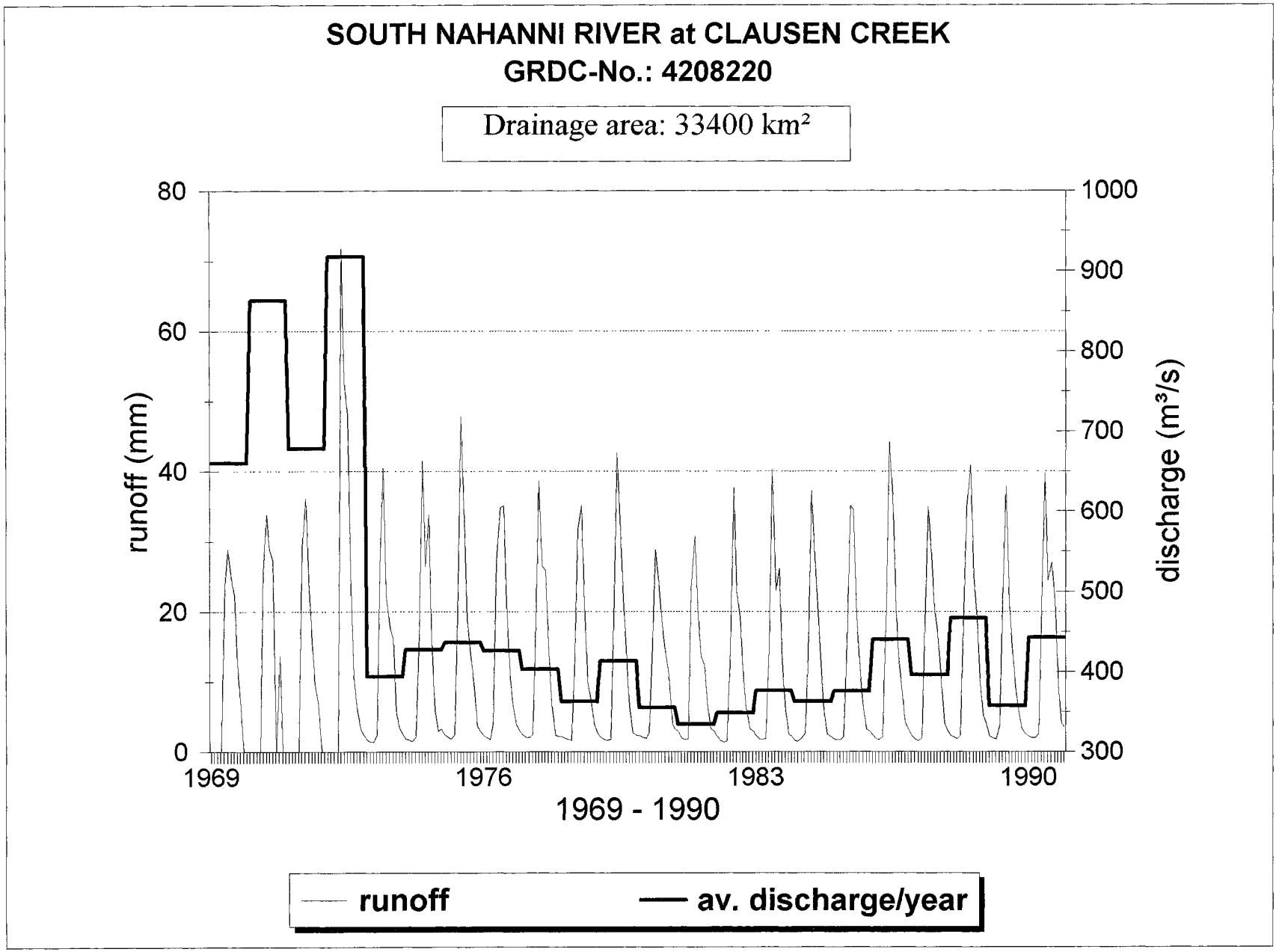
	MACKENZIE							table 1
No.	River	Station	Area (km²)	Latitude	Longitude	first rec.	last rec.	day/month
1	Rengleng River	below Highway No. 8	1310	6775N	13385W	2 1973	12 1990	D
2	Snake River	near The mouth	8910	6597N	13402W	8 1975	12 1990	D
3	Weldon Creek	near The mouth	847	6638N	13265W	1 1978	12 1990	D
4	Carcajou River	below Imperial River	6860	6528N	12768W	7 1976	12 1990	D
5	**Mackenzie River**	**Norman Wells**	**1570000**	**6528N**	**12685W**	**5 1943**	**12 1990**	**D**
5	**Mackenzie River**	**Norman Wells**	**1570000**	**6528N**	**12685W**	**1 1966**	**12 1984**	M
6	Hyland River	km 108.5 Nahanni Range Road	2150	6148N	12823W	9 1976	12 1990	D
7	Root River	near The mouth	9840	6247N	12342W	9 1974	12 1990	D
8	Indin River	above Chalco Lake	1790	6440N	11503W	8 1977	12 1990	D
9	South Nahanni River	above Clausen Creek	33400	6125N	12403W	5 1969	12 1990	D
9	South Nahanni River	above Clausen Creek	33400	6125N	12403W	6 1966	12 1984	M
10	Birch River	Highway No. 7	542	6133N	12208W	10 1974	12 1990	D
11	Hyland River	near Lower Post	9450	5995N	12815W	1 1978	12 1989	D
12	Dease River	Outlet of Dease Lake	1520	5880N	13008W	1 1978	12 1984	D
13	Kechika	mouth	22700	5962N	12731W	10 1962	12 1984	M
14	Coal River	At The mouth	9190	5968N	13695W	1 1978	12 1989	D
15	Liard River	Lower Crossing	104000	5942N	12610W	7 1944	12 1990	D
15	Liard River	Lower Crossing	104000	5942N	12610W	1 1960	12 1984	M
16	Liard River	Fort Liard	222000	6025N	12348W	10 1942	12 1990	D
16	Liard River	Fort Liard	222000	6025N	12348W	1 1966	12 1984	M
17	Mackenzie River	near Fort Providence	970000	6127N	11753W	3 1958	11 1978	D
17	Mackenzie River	near Fort Providence	970000	6127N	11753W	1 1966	10 1975	M
18	Snowdrift River	Outlet of Siltaza Lake	6030	6217N	10985W	3 1976	12 1990	D
19	Marten River	above Thoa River	736	6060N	10897W	4 1977	12 1990	D
20	Muskwa	near Fort Nelson	20300	5879N	12266W	9 1944	12 1984	M
21	Fort Nelson	above Muskwa River	22800	5867N	12264W	10 1978	12 1984	M
22	Salt River	below Peace Point Highway	821	5983N	11197W	1 1973	12 1980	D
23	Slave River	Fitzgerald	606000	5987N	11158W	5 1921	12 1990	D
23	Slave River	Fitzgerald	606000	5987N	11158W	6 1921	12 1984	M
24	Peace River	Peace Point	293000	5912N	11243W	2 1959	12 1990	D
24	Peace River	Peace Point	293000	5912N	11243W	1 1966	12 1984	M

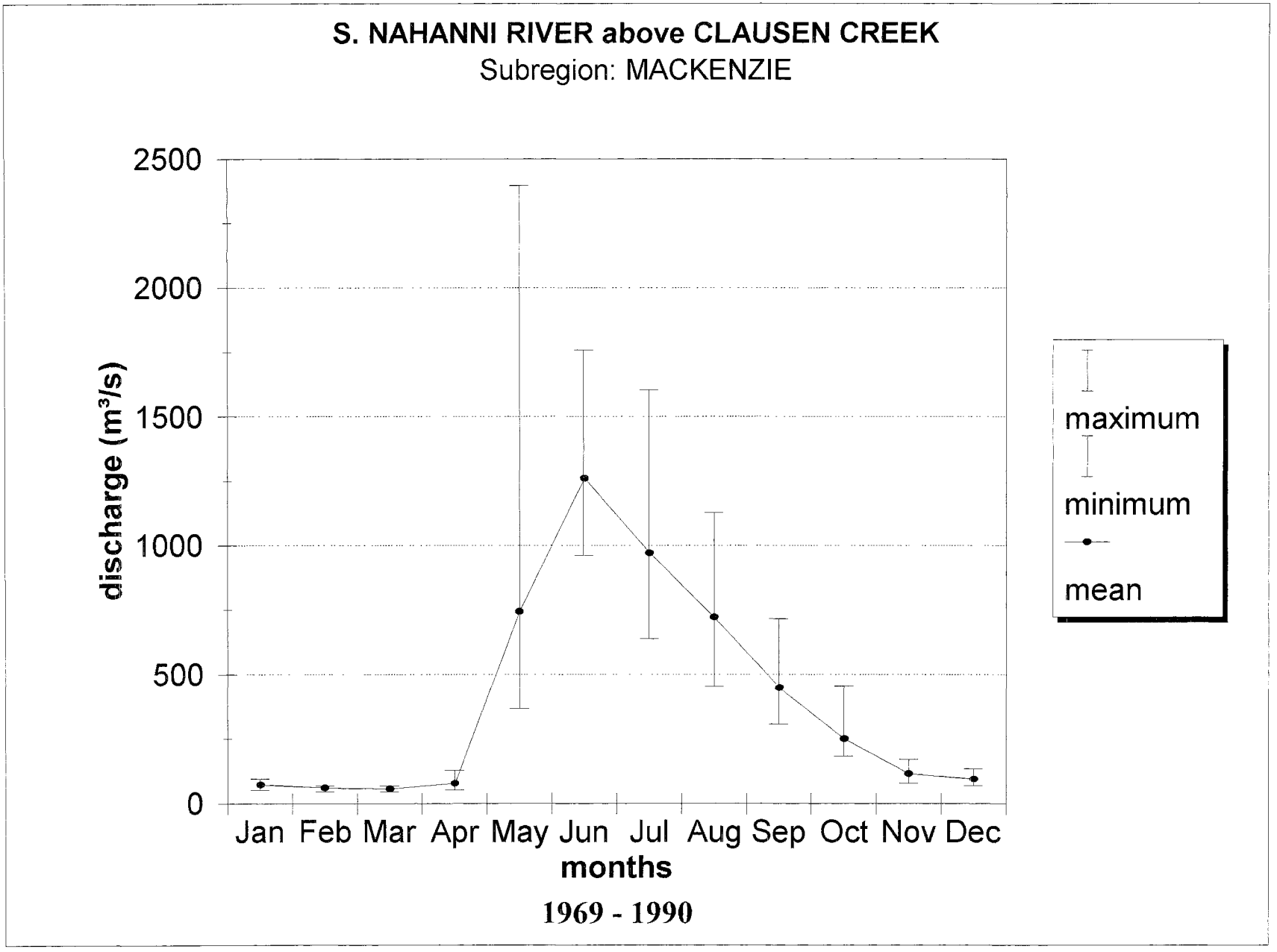
GLOBAL RUNOFF DATA CENTRE (GRDC)
20 LARGEST RIVERS

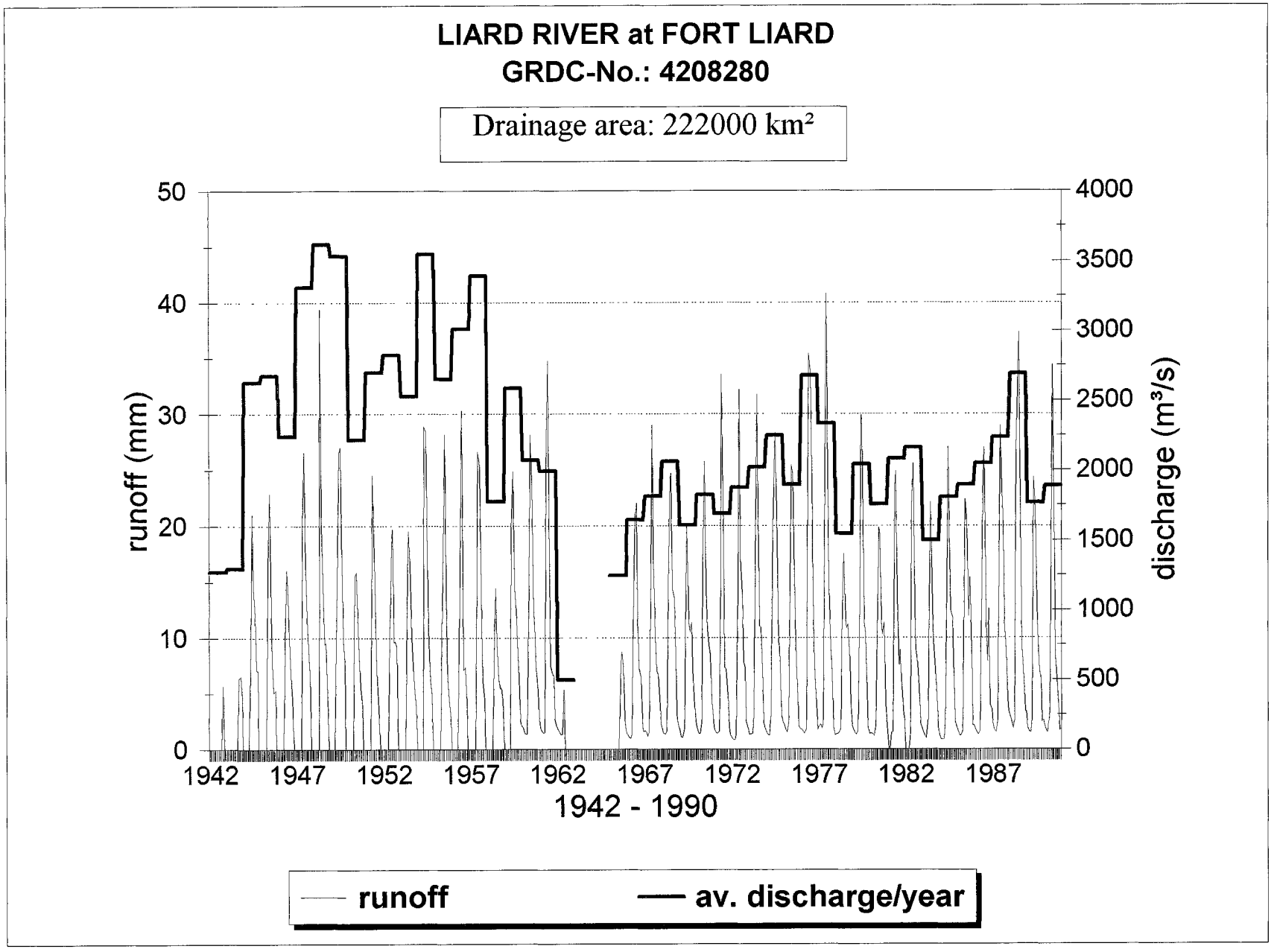
	MACKENZIE							table 2
No.	River	Station	Area (km²)	Latitude	Longitude	first rec.	last rec.	day/month
25	Ingenika River	above Swannell River	4200	5672N	12510W	1 1978	12 1989	D
26	Peace River	Hudson Hope	70200	5603N	12190W	10 1949	12 1984	M
27	Halfway	near Farrell Creek (Lower Station)	9400	5623N	12148W	6 1962	12 1983	M
28	Pine	East Pine	12100	5572N	12121W	1 1961	12 1984	M
29	Parsnip River	above Misinchinka River	4900	5507N	12293W	1 1978	12 1989	D
30	Whitemud River	near Dixonville	2010	5650N	11765W	7 1971	10 1990	D
31	Peace River	Peace River	186000	5625N	11732W	5 1915	12 1990	D
31	Peace River	Peace River	186000	5625N	11732W	6 1915	12 1984	M
32	Smoky River	Watino	50300	5572N	11762W	6 1915	12 1990	D
32	Smoky River	Watino	50300	5572N	11762W	1 1956	12 1988	M
33	Heart River	near Nampa	1960	5605N	11712W	3 1963	12 1990	D
34	Hartley Creek	near Fort Mackay	357	5725N	11145W	6 1975	10 1990	D
35	Steepbank River	near Fort Mcmurray	1370	5700N	11140W	9 1972	10 1990	D
36	Athabasca River	below Mcmurray	133000	5678N	11140W	10 1957	12 1990	D
36	Athabasca River	below Mcmurray	133000	5678N	11140W	1 1966	12 1984	M
37	Hangingstone River	Fort Mcmurray	914	5670N	11135W	3 1965	10 1990	D
38	West Prairie River	near High Prairie	1163	5543N	11648W	4 1921	12 1990	D
39	Waskahigan River	near The mouth	1040	5475N	11720W	2 1968	12 1990	D
40	Athabasca River	Athabasca	74600	5472N	11329W	5 1913	12 1990	D
40	Athabasca River	Athabasca	74600	5472N	11329W	1 1952	12 1988	M
41	Snake Indian River	near The mouth	1580	5315N	11802W	5 1971	11 1990	D
42	Athabasca River	near Jasper	3900	5290N	11805W	7 1913	12 1990	D
43	Mcleod River	above Embarras River	2560	5347N	11662W	11 1954	12 1990	D
43	Mcleod River	above Embarras River	2560	5347N	11662W	1 1955	12 1988	M
44	Wolf Creek	Highway No. 16a	829	5360N	11627W	11 1954	12 1990	D
44	Wolf Creek	Highway No. 16a	829	5360N	11627W	1 1955	12 1988	M
45	Lobstick River	near Styal	1570	5361N	11511W	11 1954	12 1986	D
45	Lobstick River	near Styal	1570	5361N	11511W	1 1956	12 1986	M
46	Pembina River	near Entwistle	4430	5360N	11500W	5 1914	12 1990	D
46	Pembina River	near Entwistle	4430	5360N	11500W	1 1955	12 1988	M

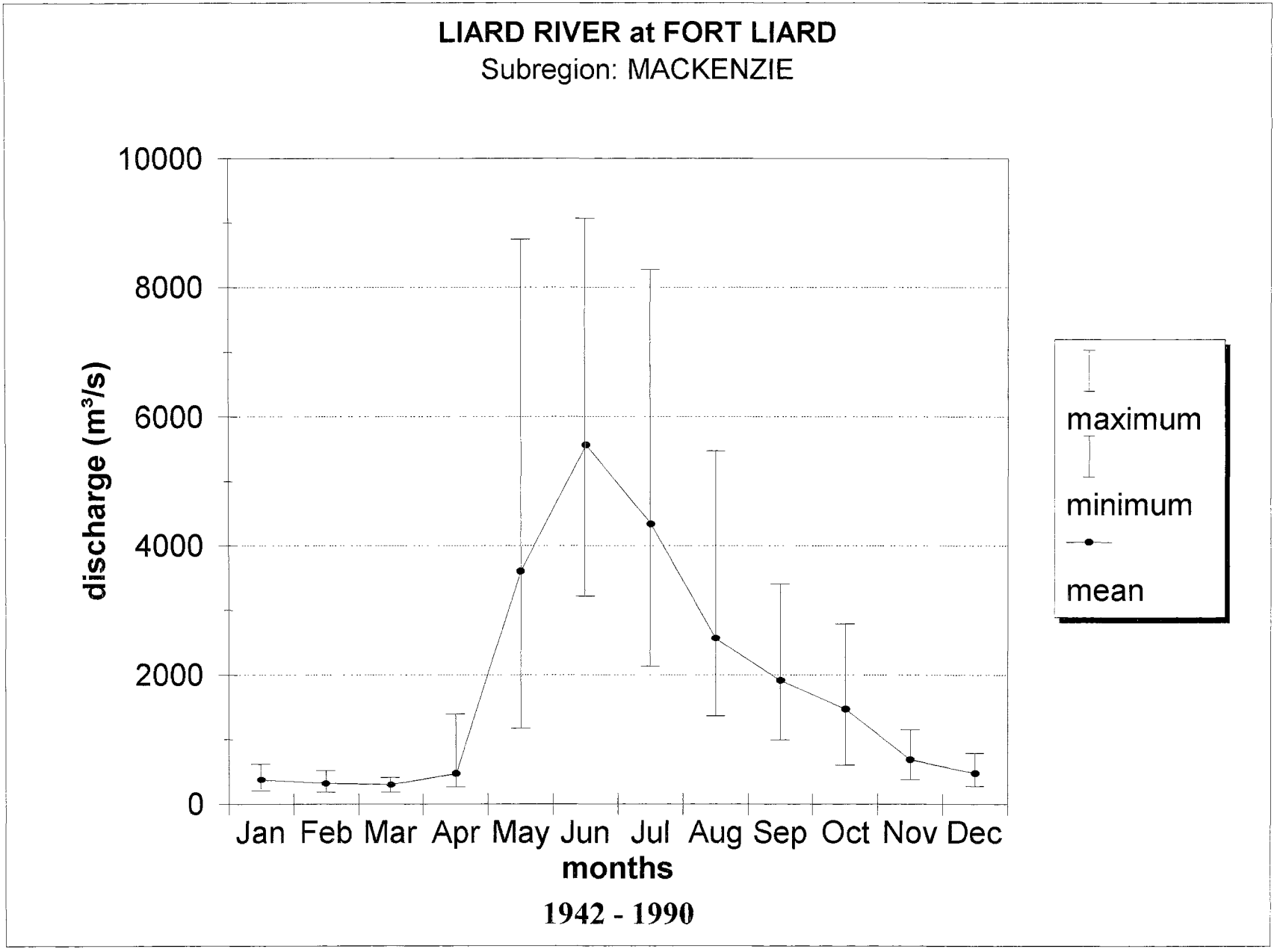

MACKENZIE at NORMAN WELLS
GRDC-No.: 4208150
Drainage area: 1570000 km²
runoff (mm)
discharge (m³/s)
0
2
4
6
8
10
12
14
16
2000
4000
6000
8000
10000
12000
14000
16000
18000
1943
1948
1953
1958
1963
1968
1973
1978
1983
1988
1943 - 1990
runoff
av. discharge/year

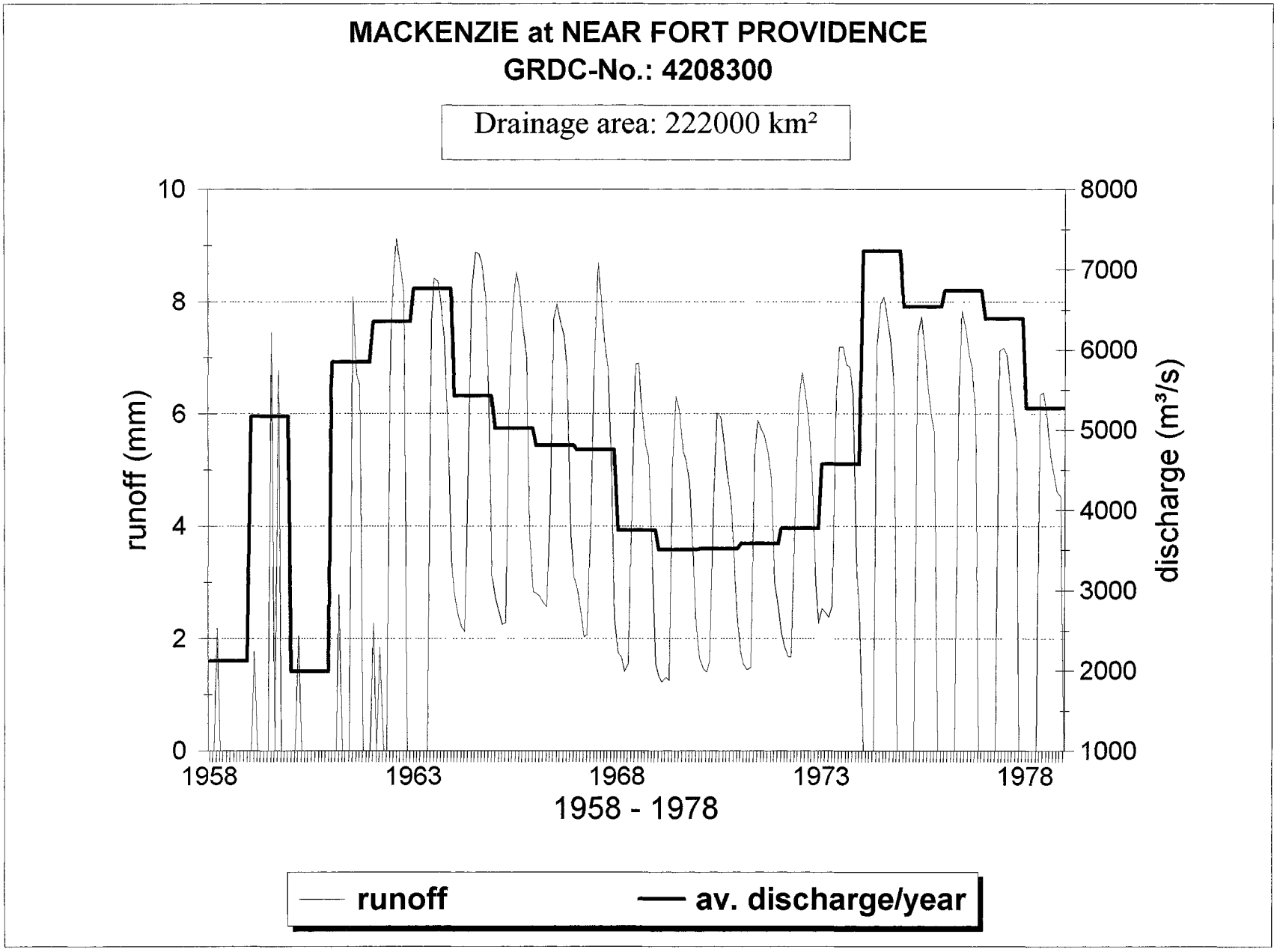

MACKENZIE at NORMAN WELLS
Subregion: MACKENZIE
25000
20000
15000
10000
5000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
maximum
minimum
mean
1943 - 1990

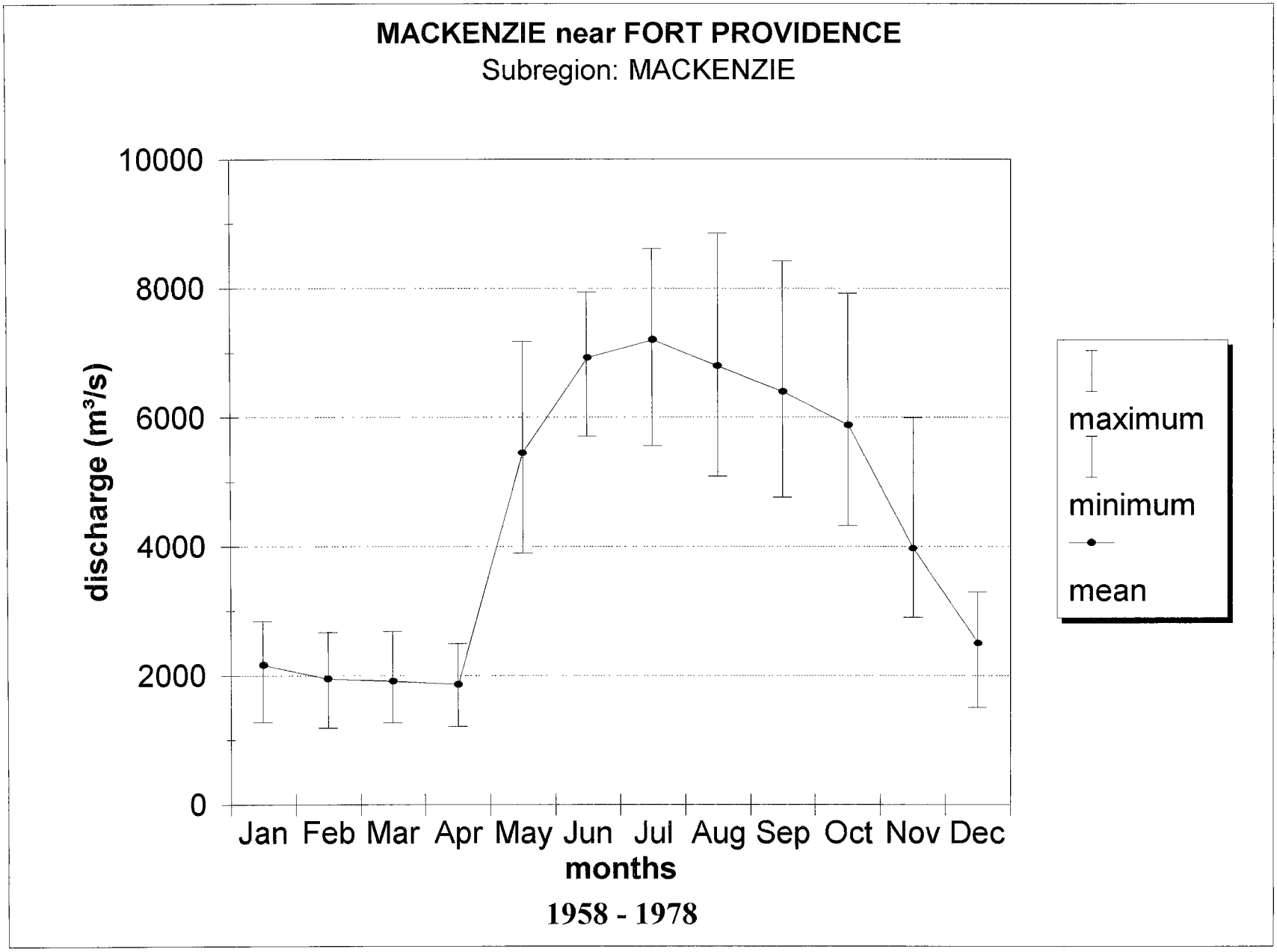

SOUTH NAHANNI RIVER at CLAUSEN CREEK
GRDC-No.: 4208220
Drainage area: 33400 km²
runoff (mm)
discharge (m³/s)
80
60
40
20
0
1000
900
800
700
600
500
400
300
1969
1976
1983
1990
1969 - 1990
runoff
av. discharge/year

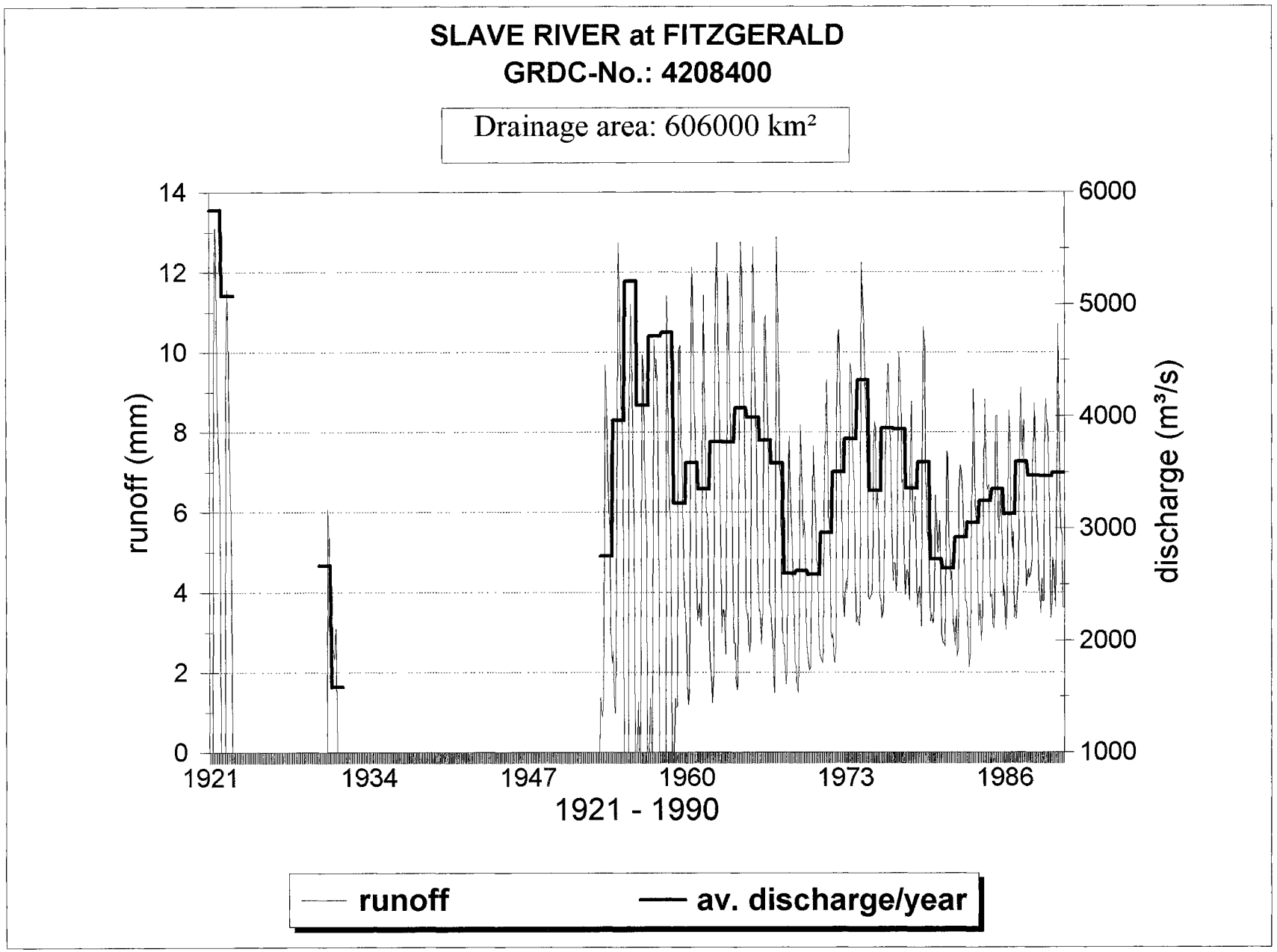

S. NAHANNI RIVER above CLAUSEN CREEK
Subregion: MACKENZIE
2500
2000
1500
1000
500
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1969 - 1990
maximum
minimum
mean

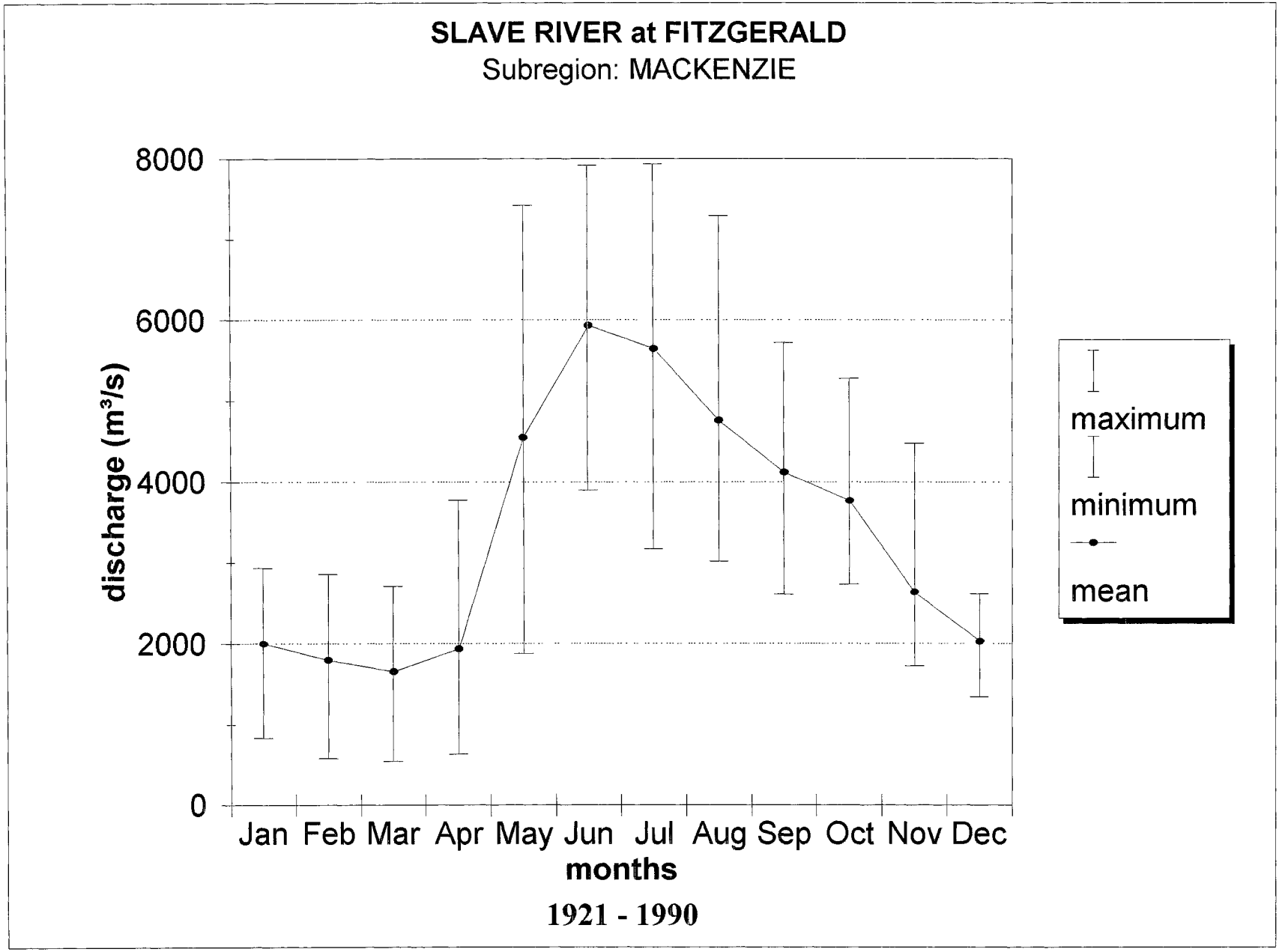

LIARD RIVER at FORT LIARD
GRDC-No.: 4208280
Drainage area: 222000 km²
runoff (mm)
discharge (m³/s)
0
10
20
30
40
50
0
500
1000
1500
2000
2500
3000
3500
4000
1942
1947
1952
1957
1962
1967
1972
1977
1982
1987
1942 - 1990
runoff
av. discharge/year

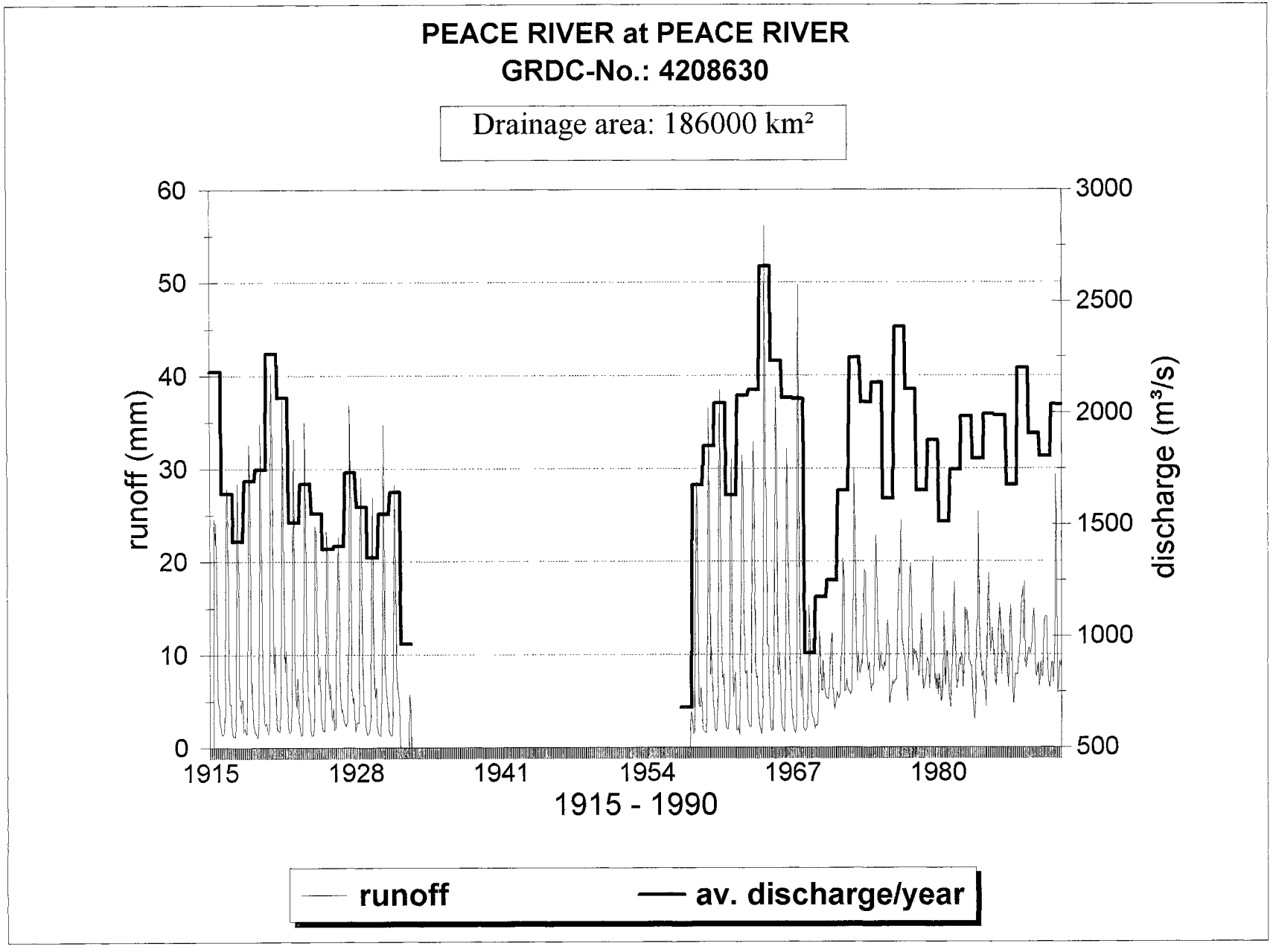

LIARD RIVER at FORT LIARD
Subregion: MACKENZIE
10000
8000
6000
4000
2000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1942 - 1990
maximum
minimum
mean

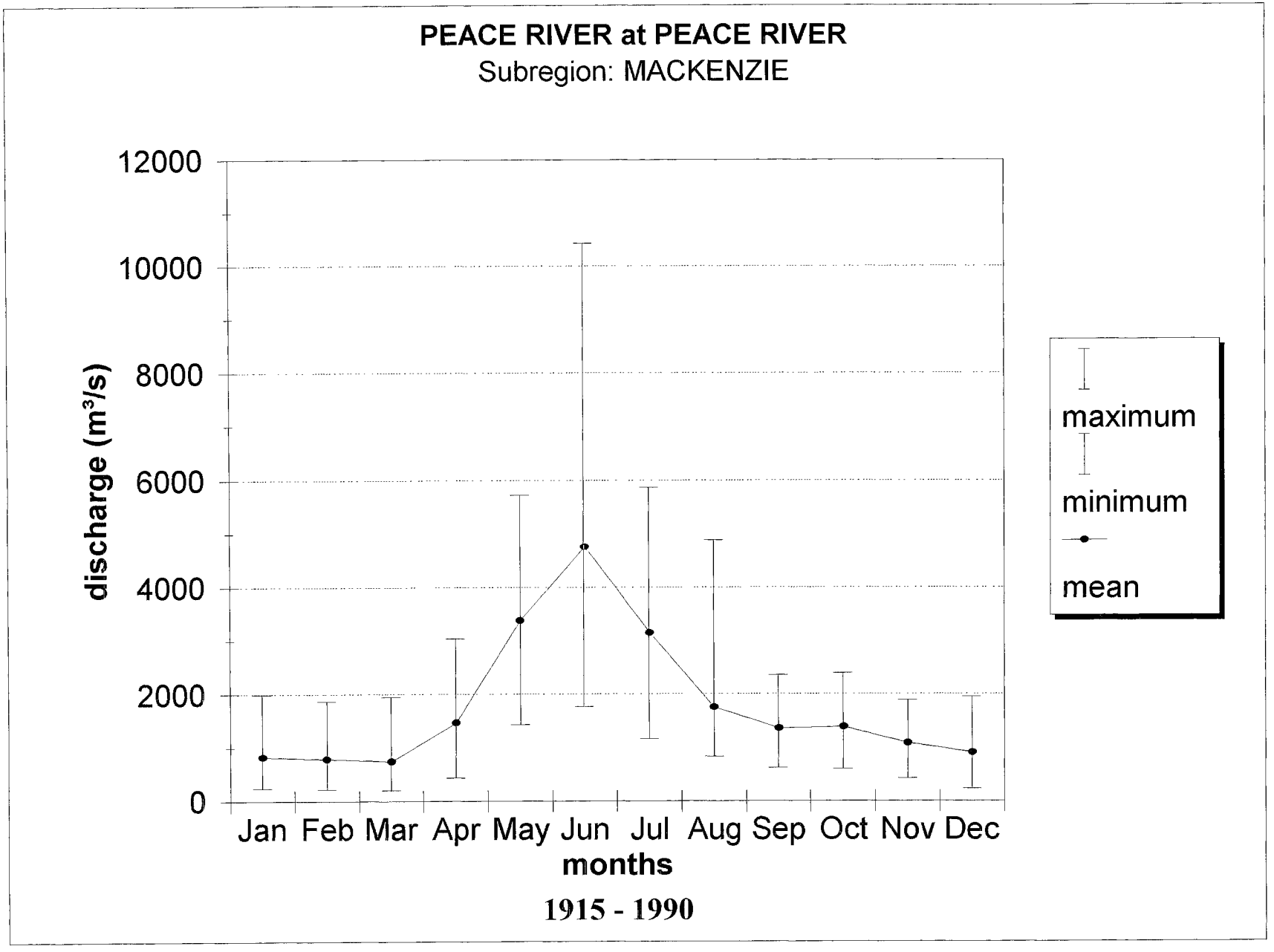

MACKENZIE at NEAR FORT PROVIDENCE
GRDC-No.: 4208300
Drainage area: 222000 km²
runoff (mm)
discharge (m³/s)
0
2
4
6
8
10
1000
2000
3000
4000
5000
6000
7000
8000
1958
1963
1968
1973
1978
1958 - 1978
runoff
av. discharge/year

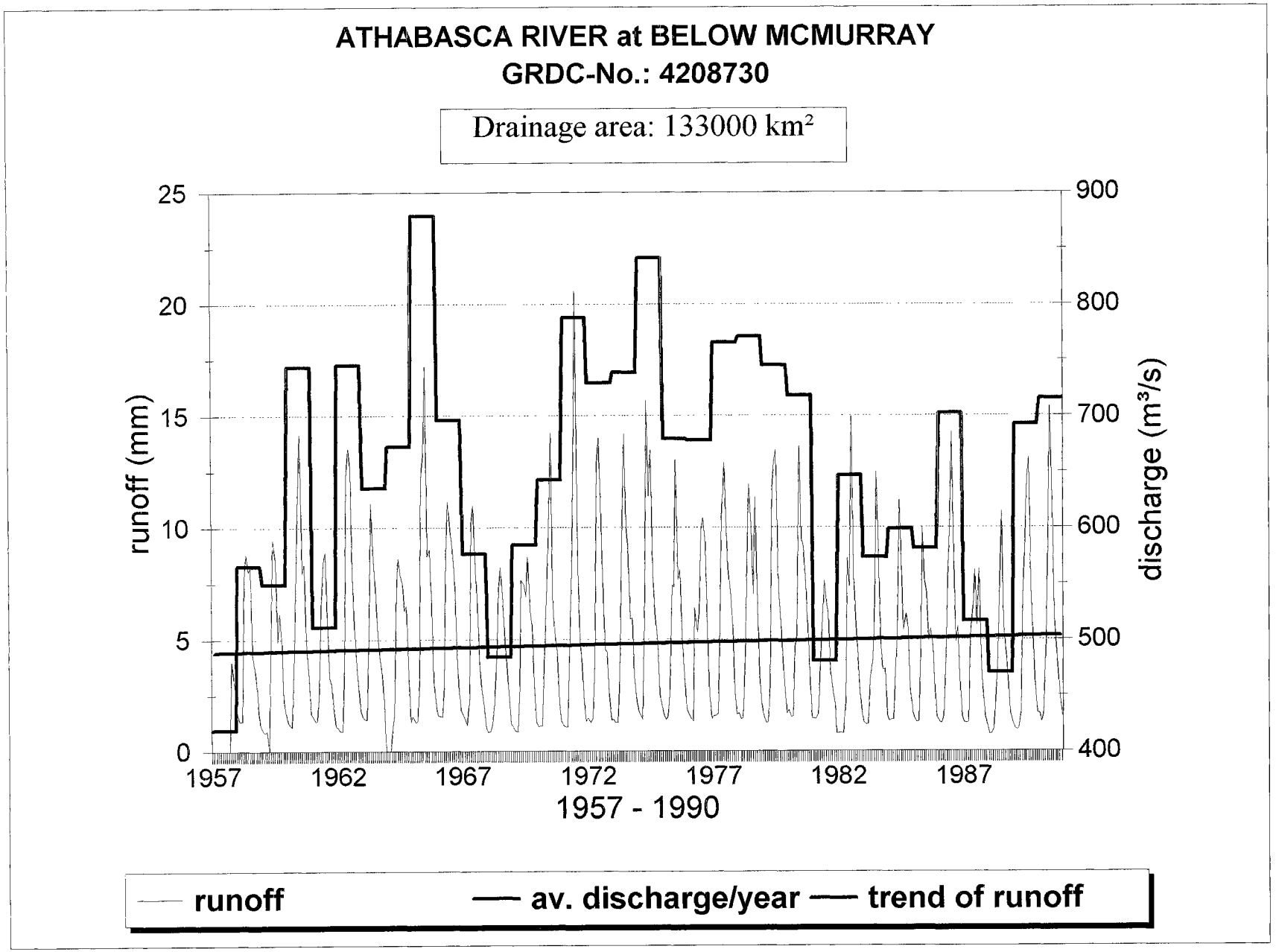

MACKENZIE near FORT PROVIDENCE
Subregion: MACKENZIE
10000
8000
6000
4000
2000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1958 - 1978
maximum
minimum
mean

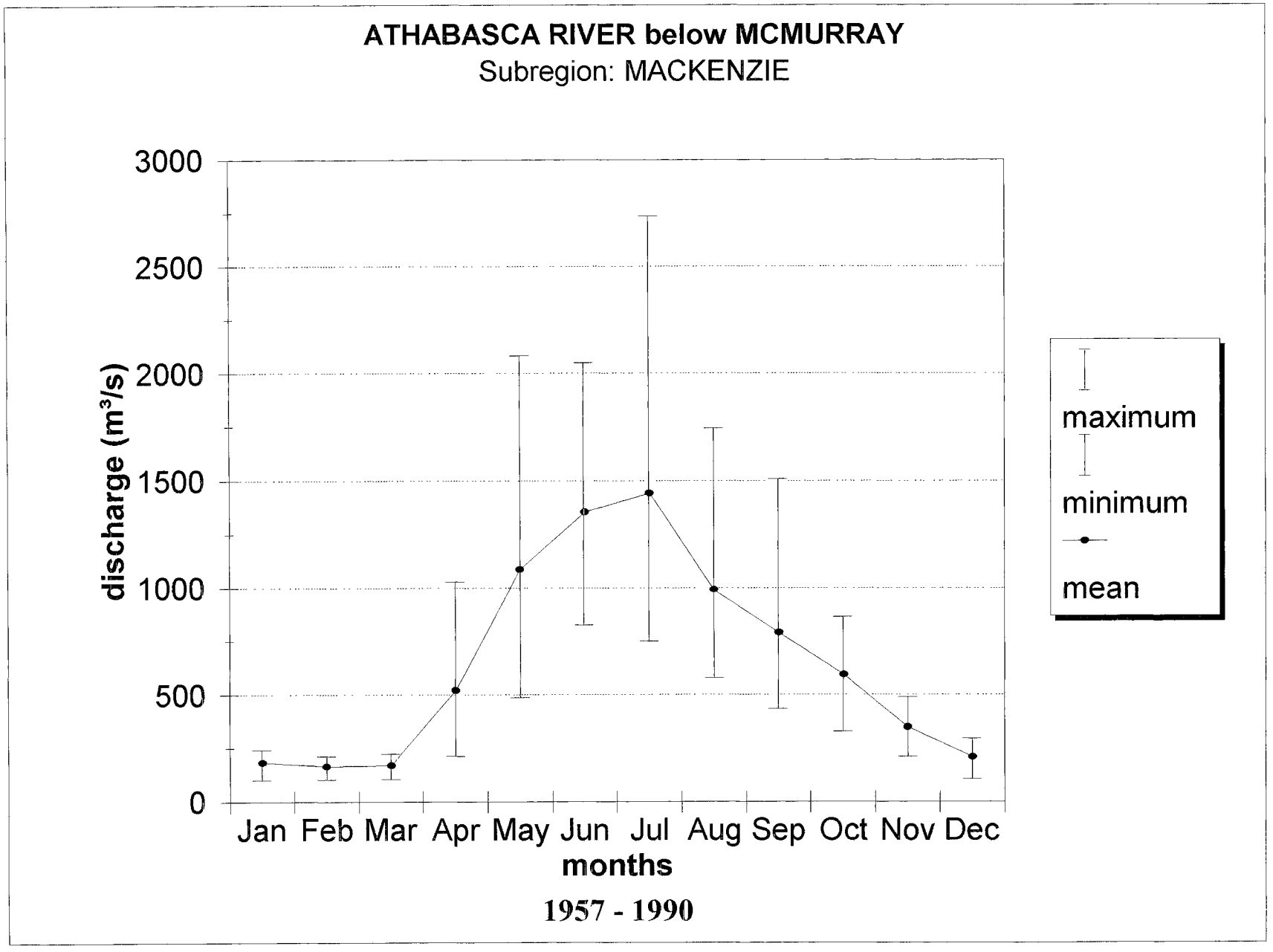

SLAVE RIVER at FITZGERALD
GRDC-No.: 4208400
Drainage area: 606000 km²
runoff (mm)
discharge (m³/s)
0
2
4
6
8
10
12
14
1000
2000
3000
4000
5000
6000
1921
1934
1947
1960
1973
1986
1921 - 1990
runoff
av. discharge/year

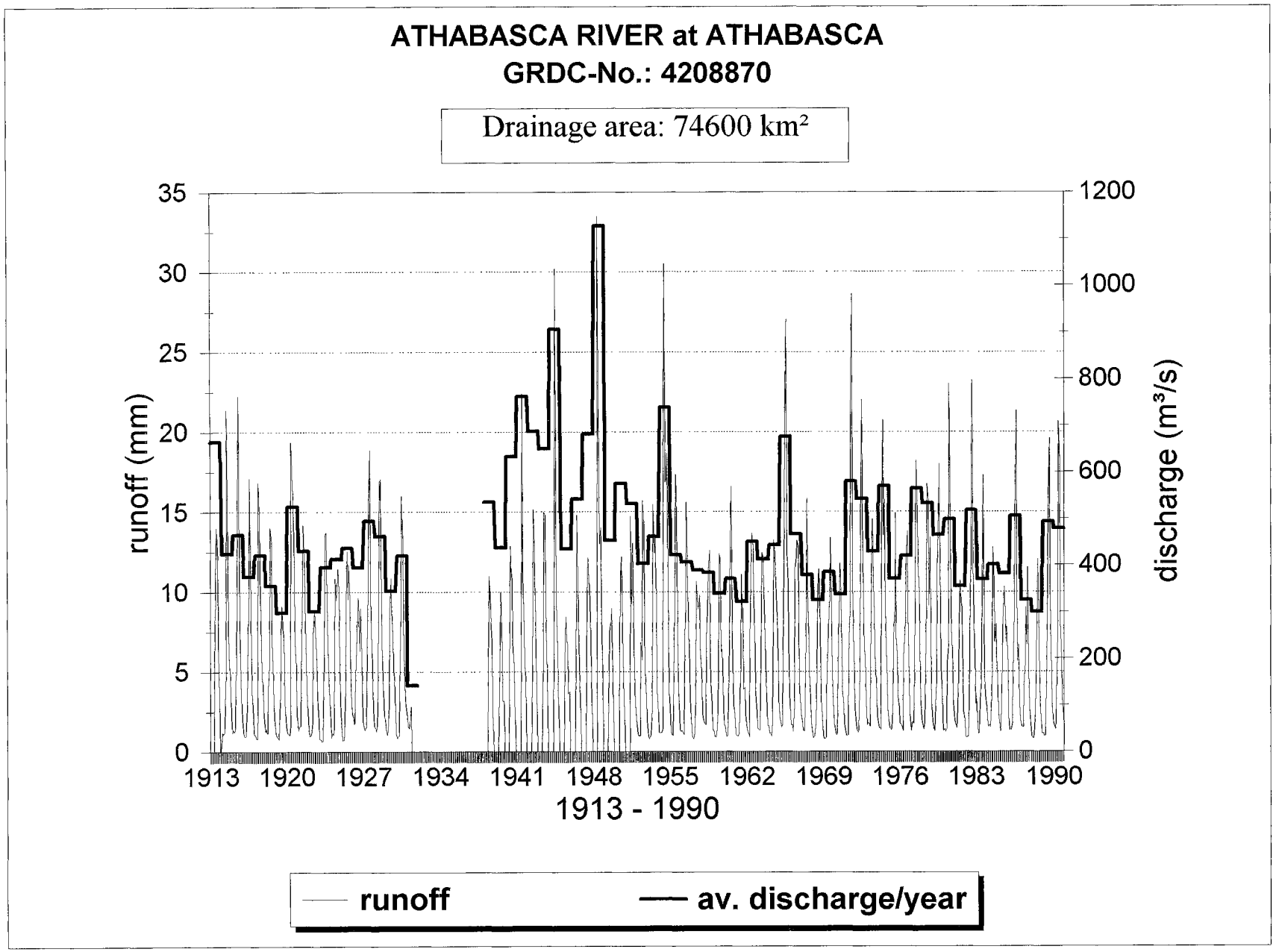

SLAVE RIVER at FITZGERALD
Subregion: MACKENZIE
8000
6000
4000
2000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
maximum
minimum
mean
1921 - 1990

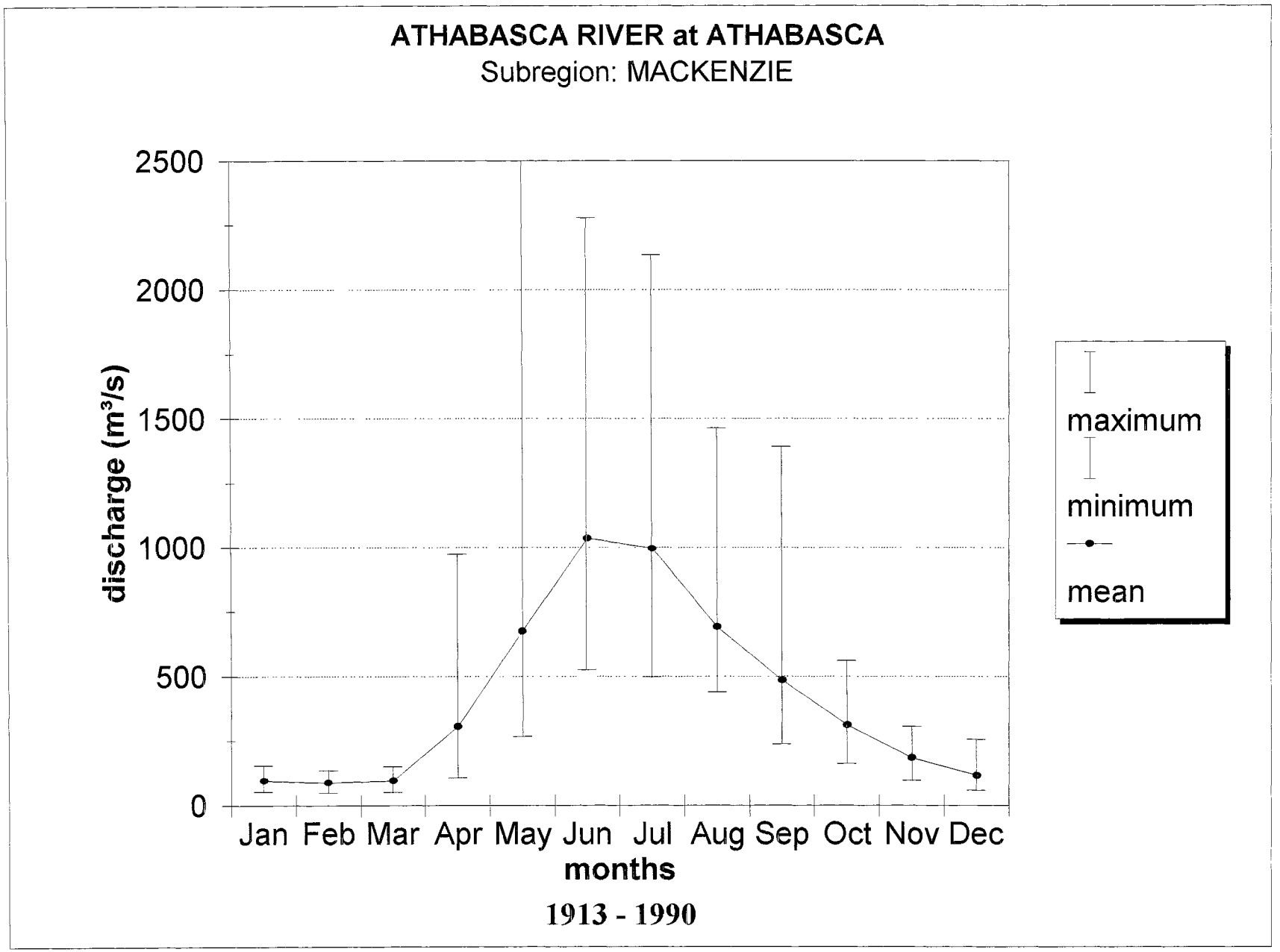

PEACE RIVER at PEACE RIVER
GRDC-No.: 4208630
Drainage area: 186000 km²
runoff (mm)
discharge (m³/s)
60
50
40
30
20
10
0
3000
2500
2000
1500
1000
500
1915
1928
1941
1954
1967
1980
1915 - 1990
runoff
av. discharge/year

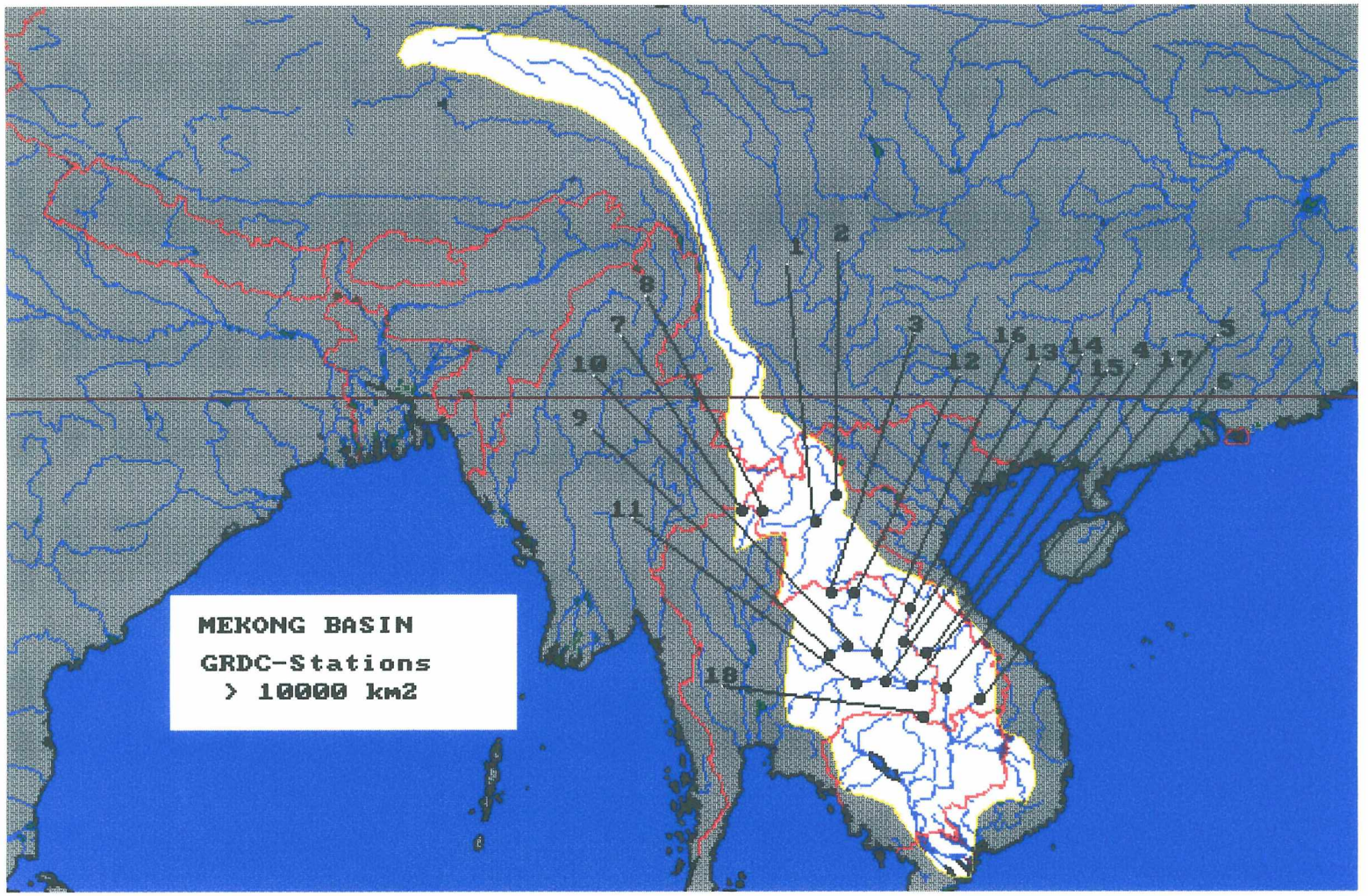

PEACE RIVER at PEACE RIVER
Subregion: MACKENZIE
12000
10000
8000
6000
4000
2000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1915 - 1990
maximum
minimum
mean


ATHABASCA RIVER at BELOW MCMURRAY
GRDC-No.: 4208730
Drainage area: 133000 km²
runoff (mm)
discharge (m³/s)
25
20
15
10
5
0
900
800
700
600
500
400
1957
1962
1967
1972
1977
1982
1987
1957 - 1990
runoff
av. discharge/year
trend of runoff


ATHABASCA RIVER below MCMURRAY
Subregion: MACKENZIE
discharge (m³/s)
3000
2500
2000
1500
1000
500
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
maximum
minimum
mean
1957 - 1990


ATHABASCA RIVER at ATHABASCA
GRDC-No.: 4208870
Drainage area: 74600 km²
runoff (mm)
discharge (m³/s)
0
5
10
15
20
25
30
35
0
200
400
600
800
1000
1200
1913
1920
1927
1934
1941
1948
1955
1962
1969
1976
1983
1990
1913 - 1990
runoff
av. discharge/year


ATHABASCA RIVER at ATHABASCA
Subregion: MACKENZIE
2500
2000
1500
1000
500
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1913 - 1990
maximum
minimum
mean

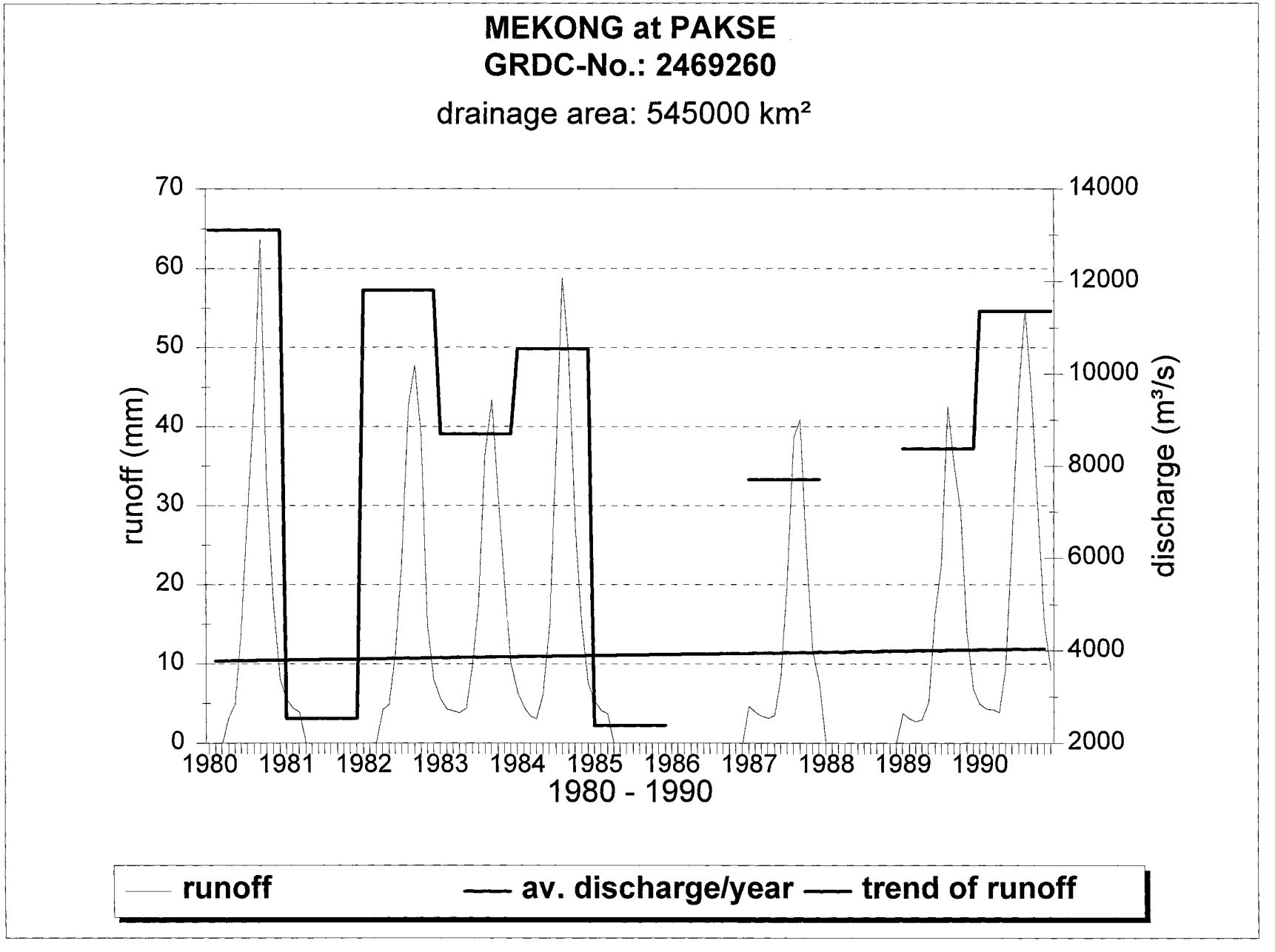

MEKONG BASIN
GRDC-Stations
> 10000 km2
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18

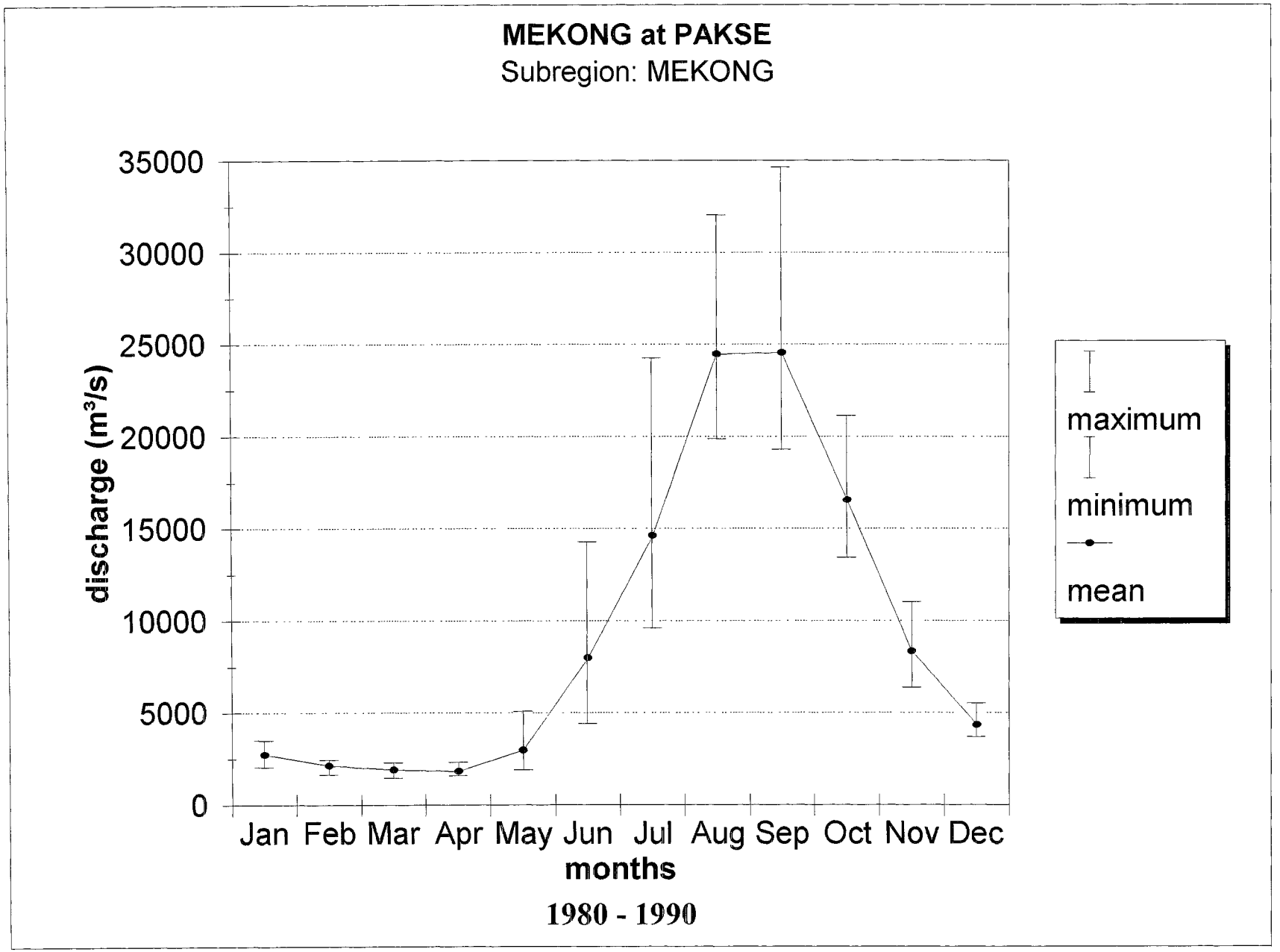
GLOBAL RUNOFF DATA CENTRE (GRDC)
20 LARGEST RIVERS

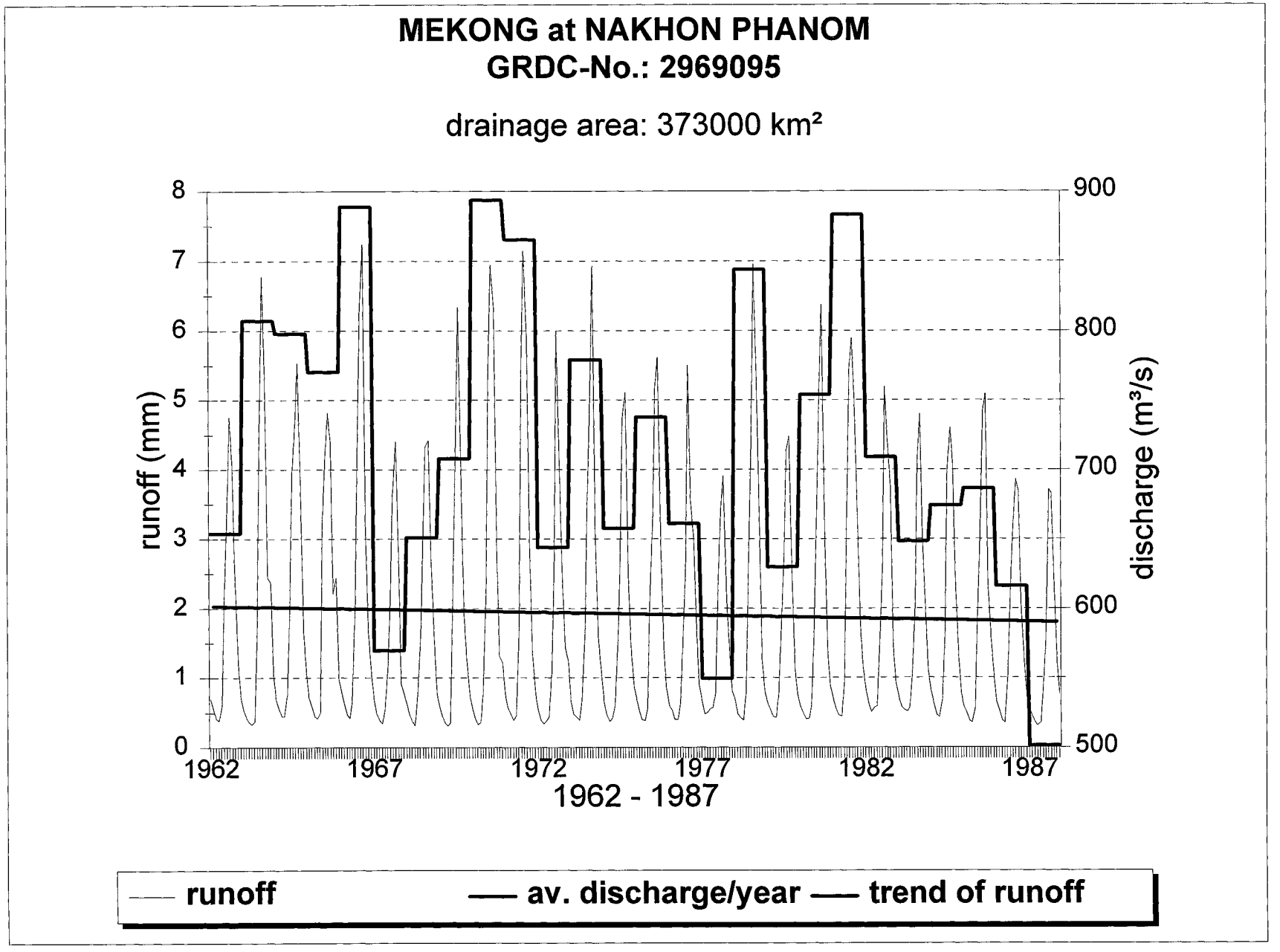
	MEKONG							table 1
No.	River	Station	Area (km²)	Latitude	Longitude	first rec.	last rec.	day/month
	Dak Bla	Kontum	3056	1433N	10800E	4 1984	12 1990	D
	Ea Krong	Cau-14	8650	1260N	10793E	4 1984	12 1990	D
	Nam Khan	Ban-Mixay (Ban Mout)	6100	1978N	10217E	4 1980	12 1989	D
1	Mekong	Luang Prabang	268000	1988N	10213E	4 1980	12 1990	D
	Nam Lik	Ban-Hin Heup	5115	1865N	10235E	7 1983	12 1990	D
	Nam Ngum	Ban-Na Luong	5220	1890N	10277E	1 1987	12 1989	D
	Nam Ngum	Ban-Pak Kanhoung		1842N	10255E	1 1989	12 1990	D
2	Nam Ou	Muong Ngoy	19700	2070N	10275E	4 1987	12 1990	D
3	Mekong	Vientiane	299000	1792N	10262E	4 1980	12 1990	D
	Nam Nhiep	Muong Mai	4270	1850N	10365E	1 1987	12 1989	D
	Se Bang Fai	Mahaxai	4520	1741N	10520E	1 1989	12 1990	D
	Se Bang Fai	Se-Bang Fai	8560	1707N	10498E	4 1980	8 1985	D
	Se Champhone	Kengkok	2640	1643N	10520E	4 1980	12 1990	D
	Nam Theun	Ban-Signo	3370	1783N	10505E	1 1987	12 1990	D
4	Se Bang Hieng	Ban Keng Done	19400	1619N	10532E	1 1989	12 1990	D
5	**Mekong**	**Pakse**	**545000**	**1512N**	**10580E**	**4 1980**	**12 1990**	**D**
	Se Done	Souvanna Khili	5760	1538N	10582E	1 1987	12 1990	D
6	Se Kong	Attopeu	10500	1481N	10684E	1 1989	12 1990	D
	Nam Mae Fang	Ban Tha Mai Liam	1800	2002N	9935E	4 1980	12 1989	D
7	Mekong	Chiang Saen	189000	2027N	10010E	4 1980	12 1990	D
7	Mekong	Chiang Saen	189000	2027N	10010E	5 1960	4 1987	M
	Kok	Ban Tha Don	2980	2006N	9936E	4 1980	12 1990	D
8	Mekong	Sop-Kok	201000	2023N	10013E	4 1980	12 1987	D
	Nam Mae Kok	Dam-Site	5870	1993N	9973E	4 1980	12 1987	D
	Pum	Ban Mae Chai	165	1935N	9987E	1 1978	3 1982	D
	Nam Mae Lao	Ban Tha Sai	3050	1985N	9983E	4 1980	12 1990	D
	Nam Mae Ing	Thoeng	5700	1968N	10018E	4 1980	12 1990	D
	Nam Heung	Ban Pak Huai	4090	1770N	10140E	4 1980	12 1990	D
	Nam Loei	Wang Saphung	1240	1728N	10177E	4 1980	12 1987	D
	Nam Pong	Si Chomphu	1250	1687N	10218E	4 1980	12 1990	D
	Huai Luang	Ban Tha Tum	1210	1747N	10280E	6 1980	3 1987	D

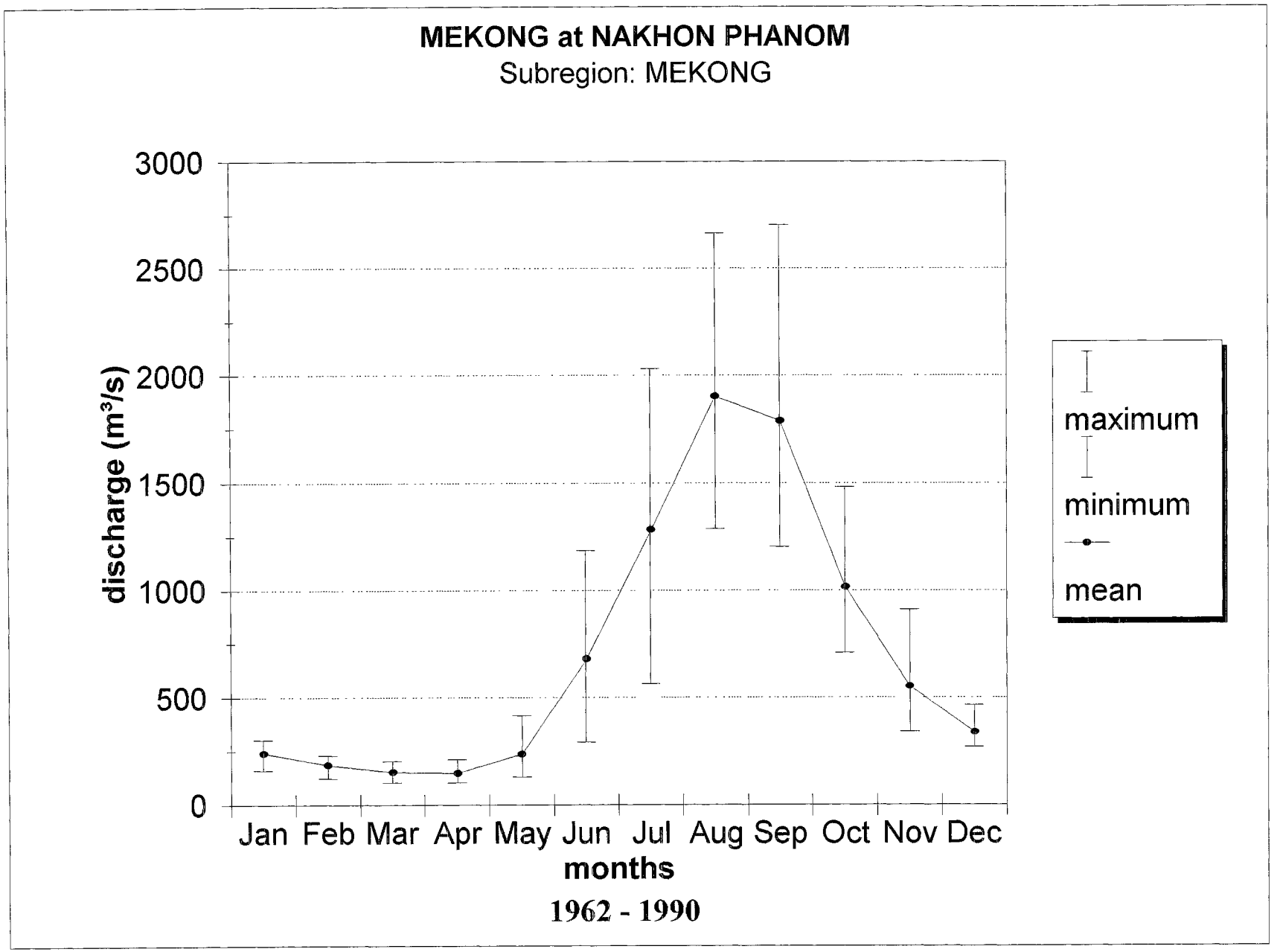
GLOBAL RUNOFF DATA CENTRE (GRDC)
20 LARGEST RIVERS

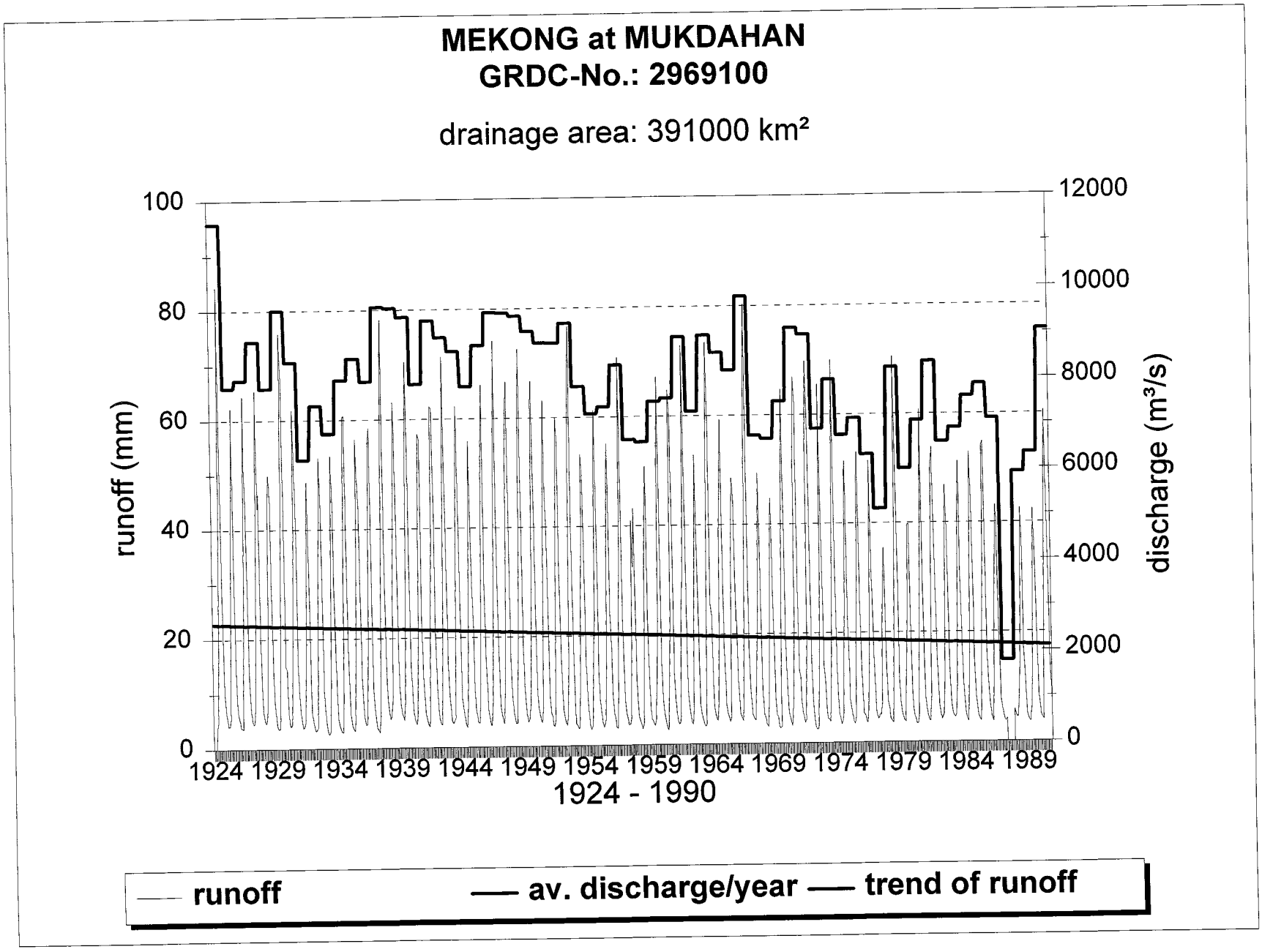
	MEKONG							table 2
No.	River	Station	Area (km²)	Latitude	Longitude	first rec.	last rec.	day/month
	Huai Mong	Ban Kruat	2370	1782N	10243E	5 1980	3 1986	D
	Huai Phaniang	Ban Wang Mun	1260	1717N	10273E	4 1980	12 1987	D
	Lam Choen	Ban Tha Dua	1520	1648N	10212E	4 1980	12 1990	D
	Huai Rai	Ban Nong Kiang	1370	1613N	10167E	4 1980	12 1990	D
9	Nam Chi	Ban Chot	10200	1610N	10257E	4 1980	12 1990	D
10	Nam Chi	Ban Kok	28500	1635N	10295E	4 1980	12 1988	D
	Lam Pao	Kamalasai	5680	1633N	10357E	4 1980	3 1981	D
11	Nam Mun	Satuk	26800	1530N	10328E	4 1980	3 1987	D
12	Mekong	Nong Khai	302000	1787N	10272E	4 1980	12 1990	D
13	Mekong	Nakhon Phanom	373000	1740N	10480E	4 1980	12 1990	D
13	Mekong	Nakhon Phanom	373000	1740N	10480E	1 1962	12 1987	M
	Nam Kam	Na-Kae	2360	1695N	10450E	4 1980	12 1990	D
14	Mekong	Mukdahan	391000	1653N	10473E	4 1980	12 1990	D
14	Mekong	Mukdahan	391000	1653N	10473E	4 1924	5 1987	M
	Nam Yang	Ban Na Thom	3240	1605N	10403E	4 1980	3 1990	D
	Huai Khayung	Ban Huai Khayung	2900	1500N	10463E	1 1989	12 1990	D
	Mun	Kaset Wisai	1310	1565N	10356E	4 1981	3 1989	D
	Huai Thap Than	Huai Thap Than	2030	1503N	10402E	4 1980	3 1987	D
15	Nam Mun	Rasi Salai	44600	1533N	10415E	4 1980	12 1990	D
16	Nam Chi	Yasothon	43100	1578N	10415E	4 1980	12 1990	D
16	Nam Chi	Yasothon	43100	1578N	10415E	4 1953	3 1987	M
17	Nam Mun	Ubon	104000	1522N	10487E	4 1980	12 1990	D
17	Nam Mun	Ubon	104000	1522N	10487E	6 1955	5 1987	M
	Lam Dom Yai	Ban Fang Phe	1410	1468N	10515E	1 1989	12 1990	D
18	Nam Mun	Kaeng Saphu Tai	116000	1523N	10525E	1 1989	12 1990	D

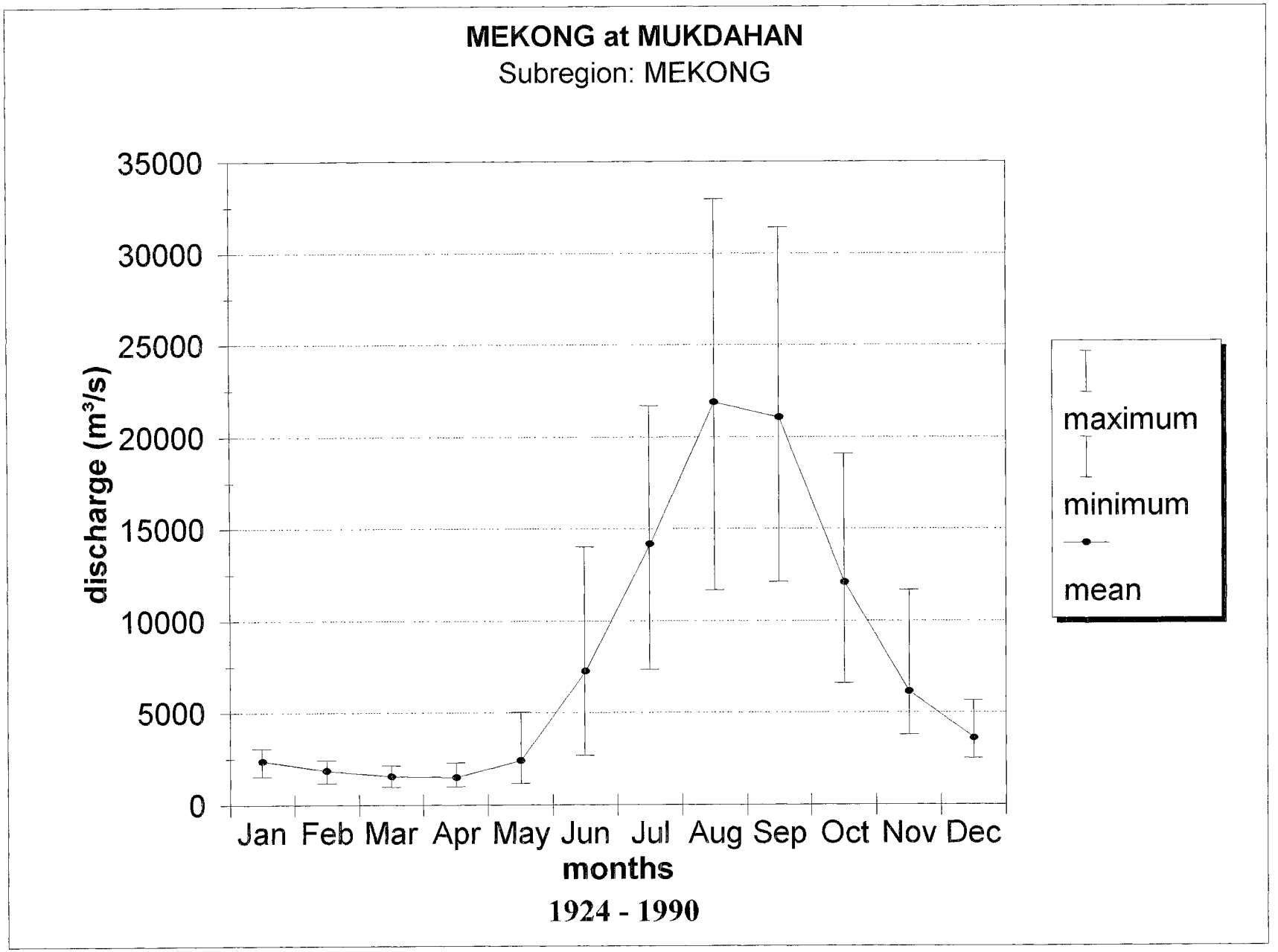

MEKONG at PAKSE
GRDC-No.: 2469260
drainage area: 545000 km²
runoff (mm)
discharge (m³/s)
70
60
50
40
30
20
10
0
14000
12000
10000
8000
6000
4000
2000
1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990
1980 - 1990
runoff
av. discharge/year
trend of runoff

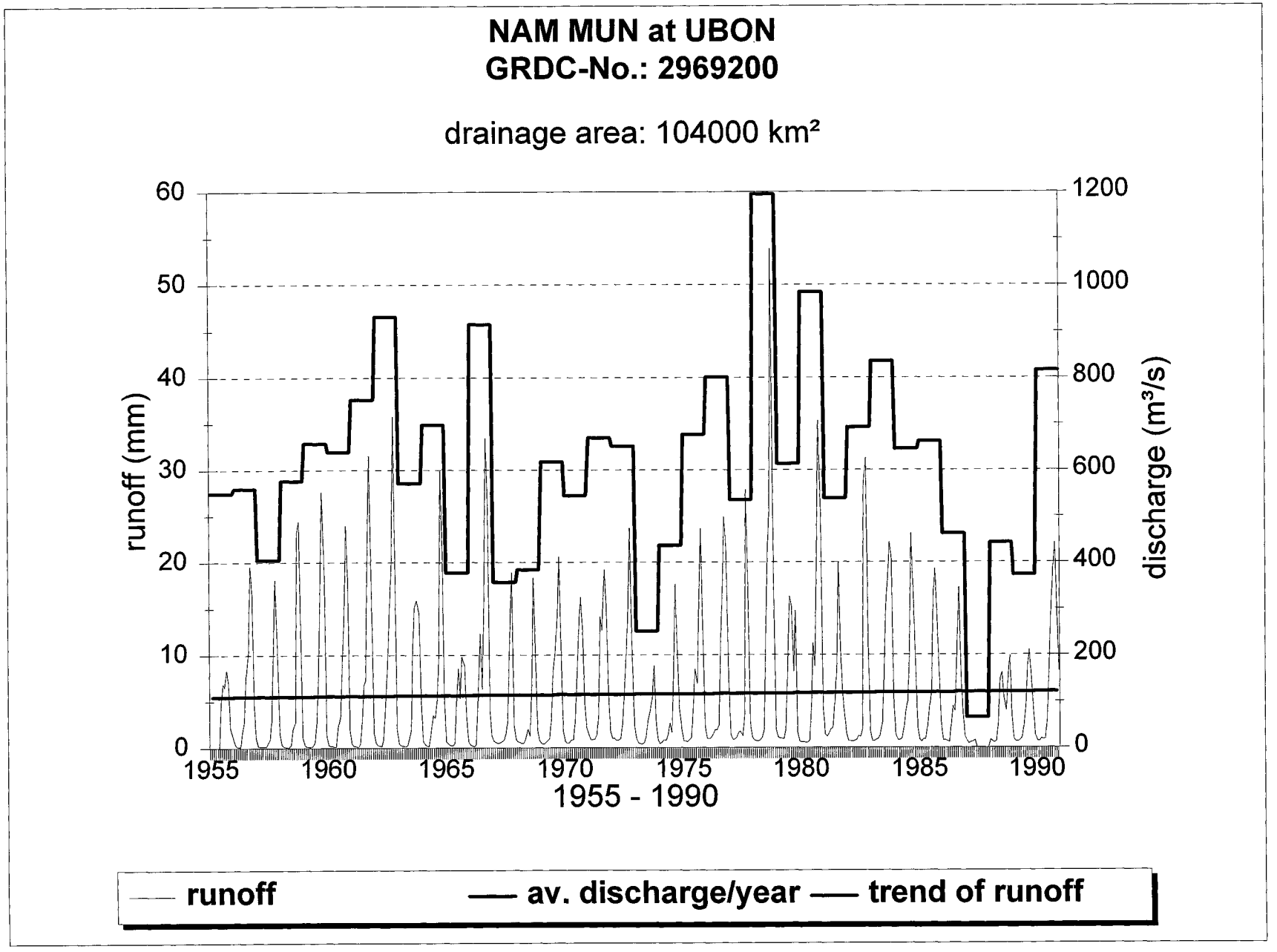

MEKONG at PAKSE
Subregion: MEKONG
35000
30000
25000
20000
15000
10000
5000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1980 - 1990
maximum
minimum
mean

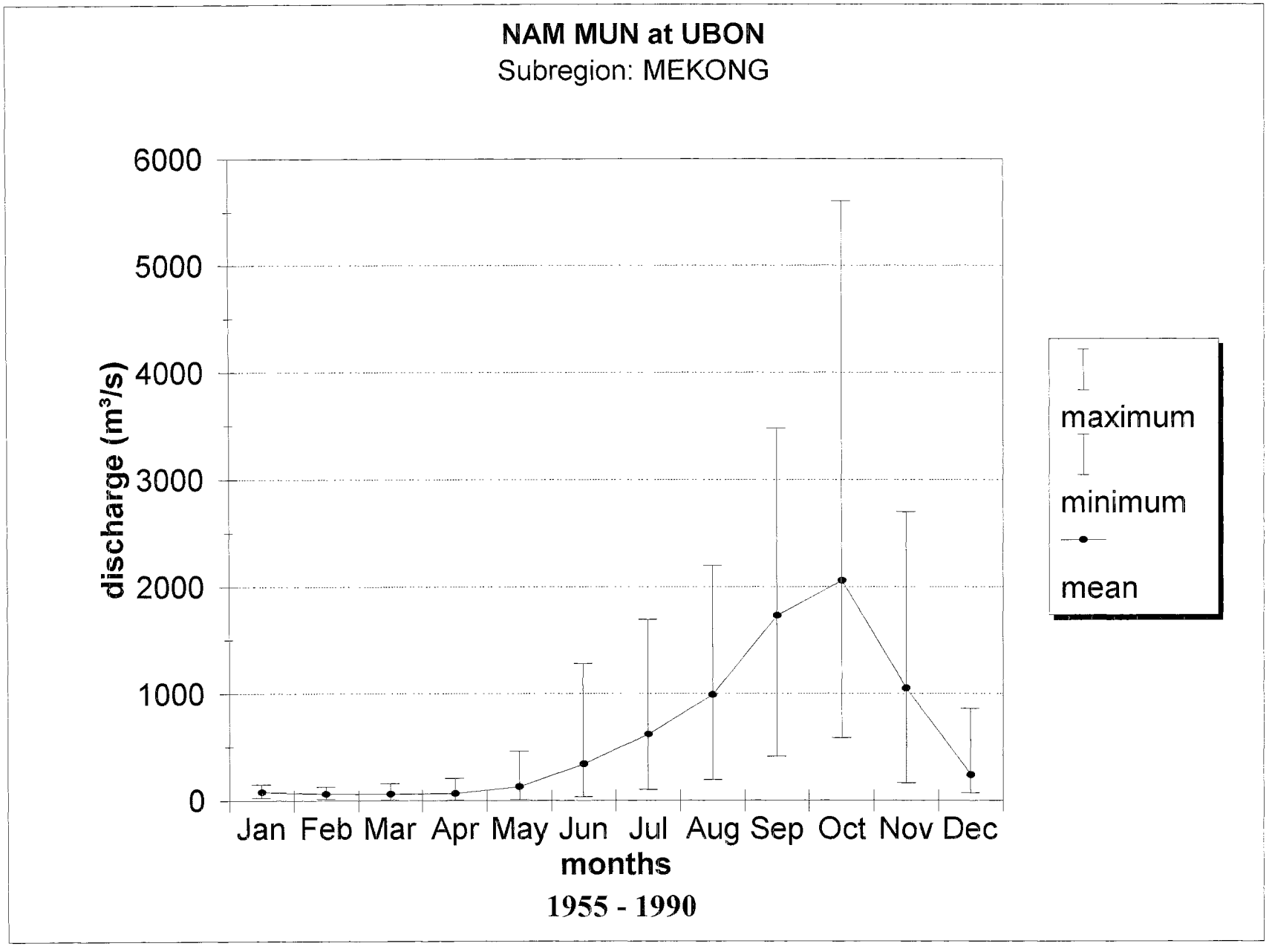

MEKONG at NAKHON PHANOM
GRDC-No.: 2969095
drainage area: 373000 km²
runoff (mm)
discharge (m³/s)
0
1
2
3
4
5
6
7
8
500
600
700
800
900
1962
1967
1972
1977
1982
1987
1962 - 1987
runoff
av. discharge/year
trend of runoff

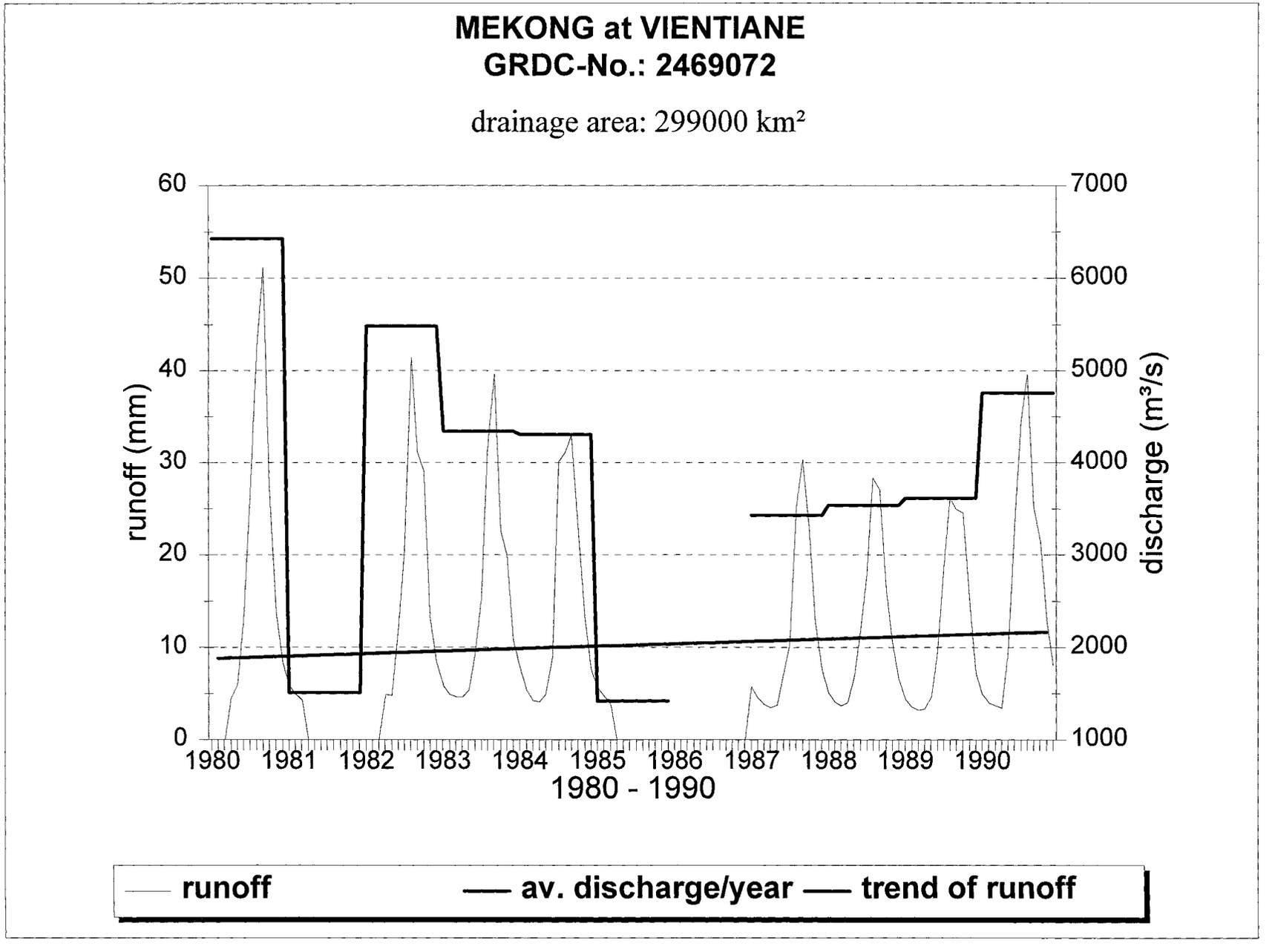

MEKONG at NAKHON PHANOM
Subregion: MEKONG
discharge (m³/s)
3000
2500
2000
1500
1000
500
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1962 - 1990
maximum
minimum
mean

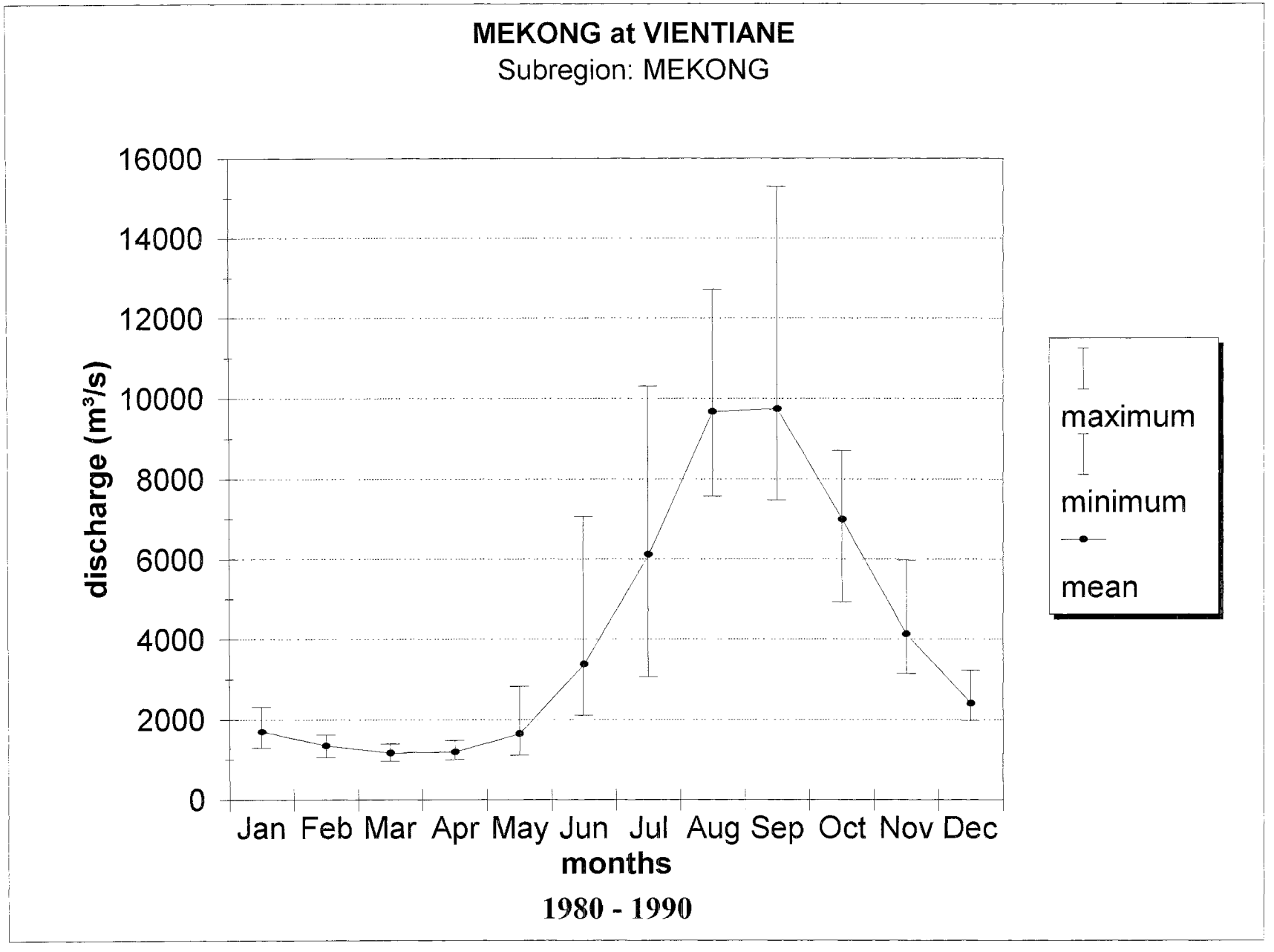

MEKONG at MUKDAHAN
GRDC-No.: 2969100
drainage area: 391000 km²
runoff (mm)
discharge (m³/s)
100
80
60
40
20
0
12000
10000
8000
6000
4000
2000
0
1924 1929 1934 1939 1944 1949 1954 1959 1964 1969 1974 1979 1984 1989
1924 - 1990
runoff
av. discharge/year
trend of runoff

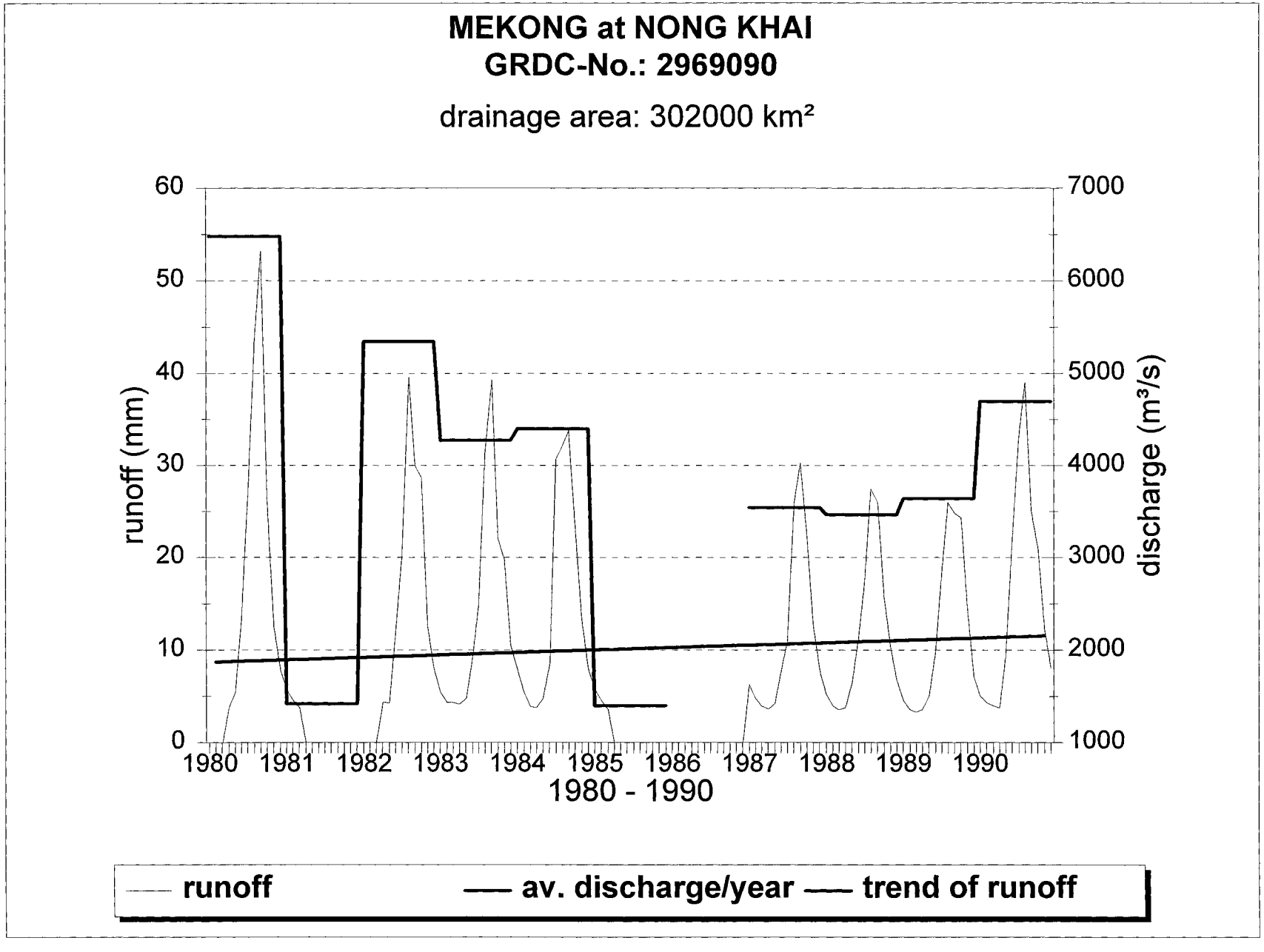

MEKONG at MUKDAHAN
Subregion: MEKONG
35000
30000
25000
20000
15000
10000
5000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1924 - 1990
maximum
minimum
mean

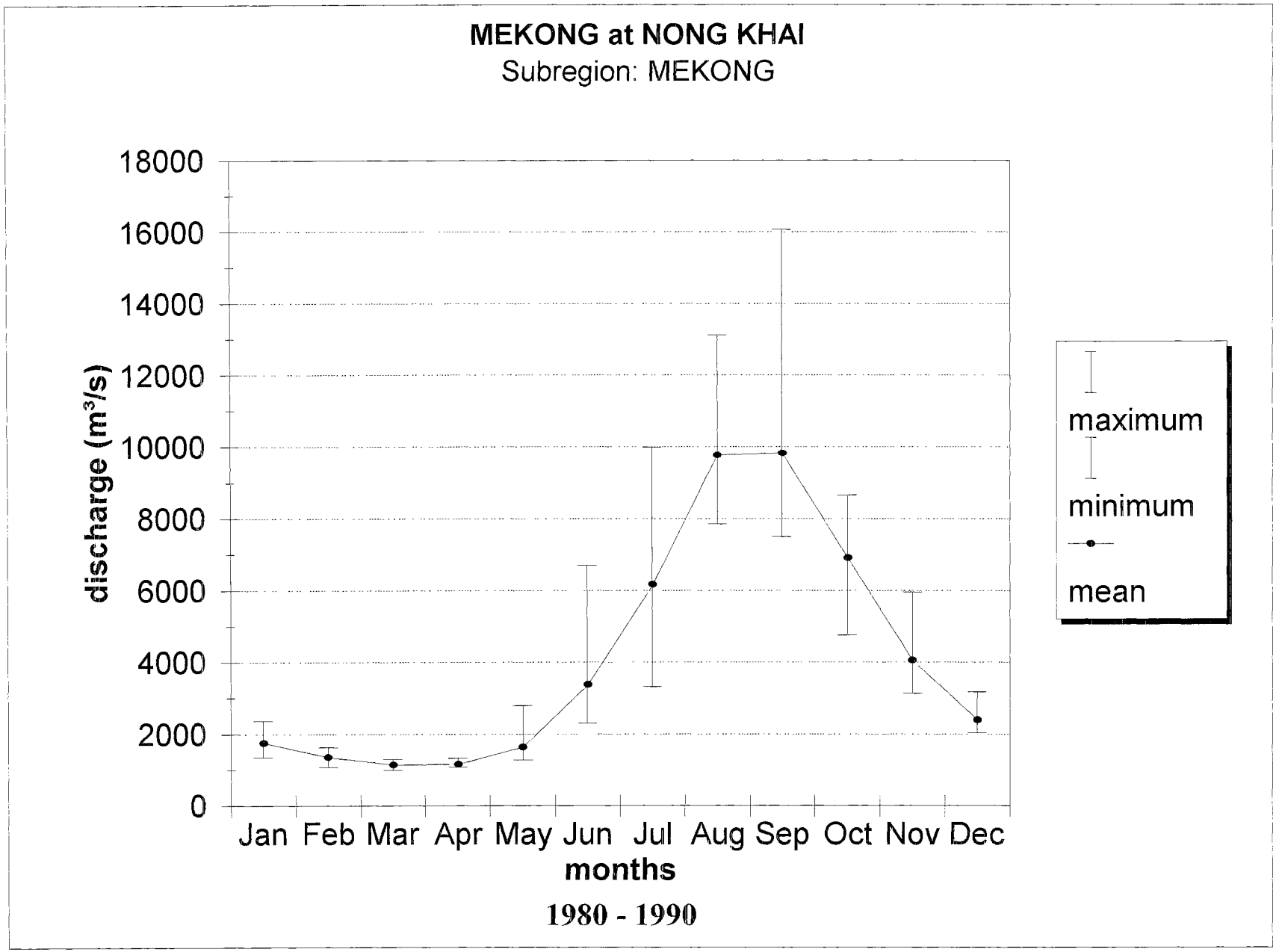

NAM MUN at UBON
GRDC-No.: 2969200
drainage area: 104000 km²
runoff (mm)
discharge (m³/s)
60
50
40
30
20
10
0
1200
1000
800
600
400
200
0
1955
1960
1965
1970
1975
1980
1985
1990
1955 - 1990
runoff
av. discharge/year
trend of runoff

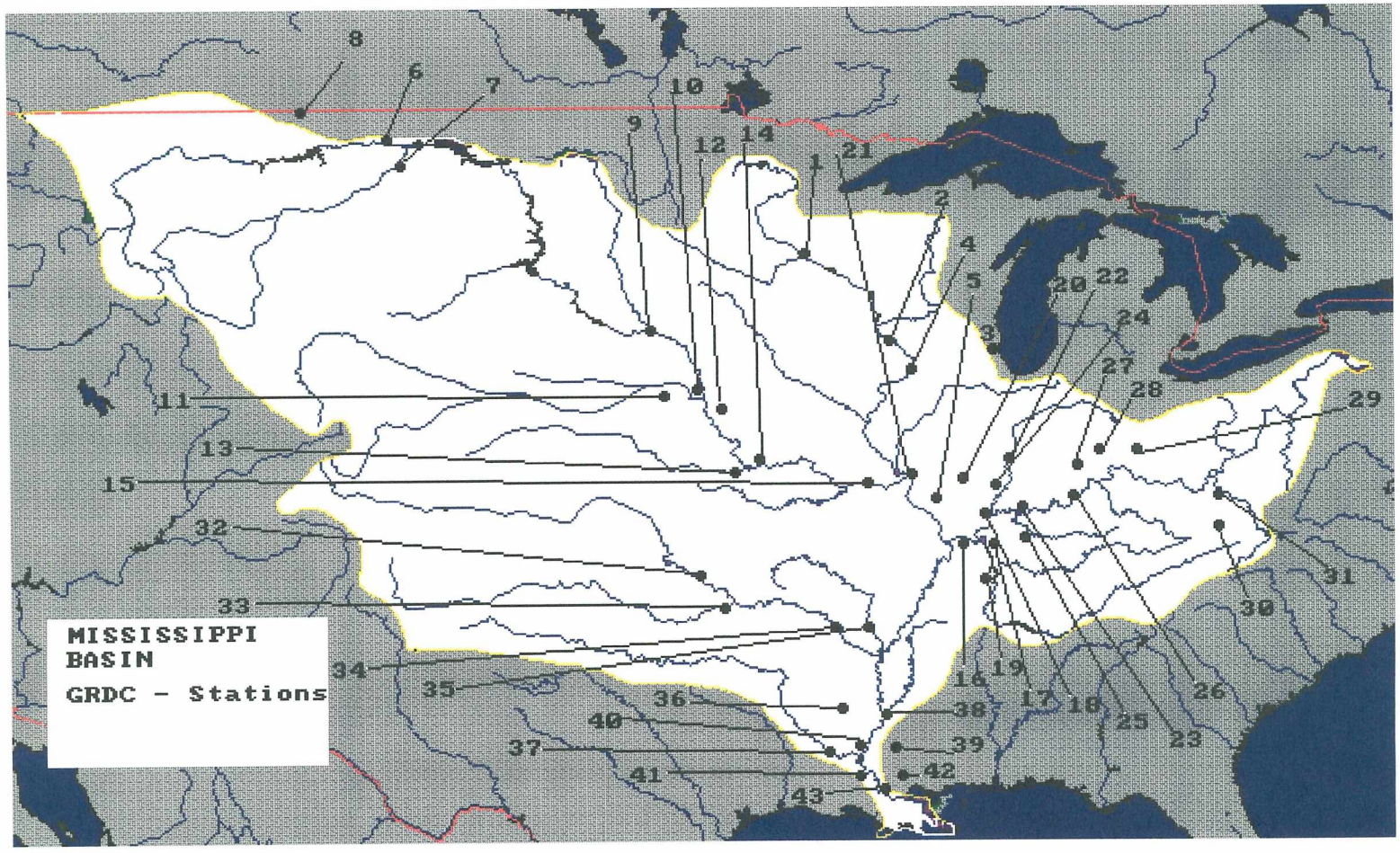

NAM MUN at UBON
Subregion: MEKONG
6000
5000
4000
3000
2000
1000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1955 - 1990
maximum
minimum
mean


MEKONG at VIENTIANE
GRDC-No.: 2469072
drainage area: 299000 km²
runoff (mm)
discharge (m³/s)
60
50
40
30
20
10
0
7000
6000
5000
4000
3000
2000
1000
1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990
1980 - 1990
runoff
av. discharge/year
trend of runoff


MEKONG at VIENTIANE
Subregion: MEKONG
16000
14000
12000
10000
8000
6000
4000
2000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
maximum
minimum
mean
1980 - 1990


MEKONG at NONG KHAI
GRDC-No.: 2969090
drainage area: 302000 km²
runoff (mm)
discharge (m³/s)
60
50
40
30
20
10
0
7000
6000
5000
4000
3000
2000
1000
1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990
1980 - 1990
runoff
av. discharge/year
trend of runoff


MEKONG at NONG KHAI
Subregion: MEKONG
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1980 - 1990
maximum
minimum
mean

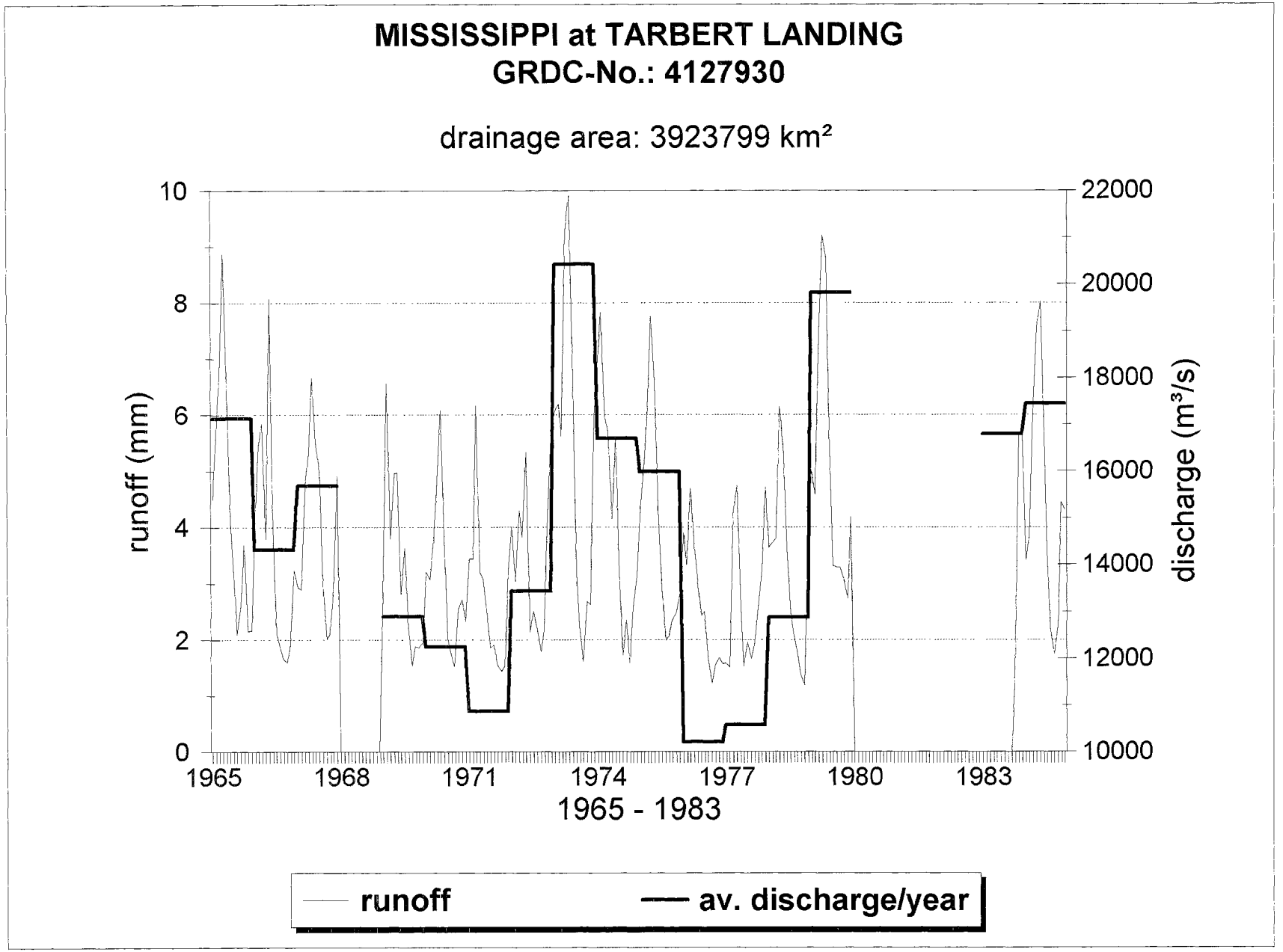

MISSISSIPPI
BASIN
GRDC - Stations
8
6
7
10
9
12
14
1
21
2
4
5
3
20
22
24
27
28
29
11
13
15
32
33
34
35
36
40
37
41
43
38
39
42
16
19
17
18
25
26
23
31
30

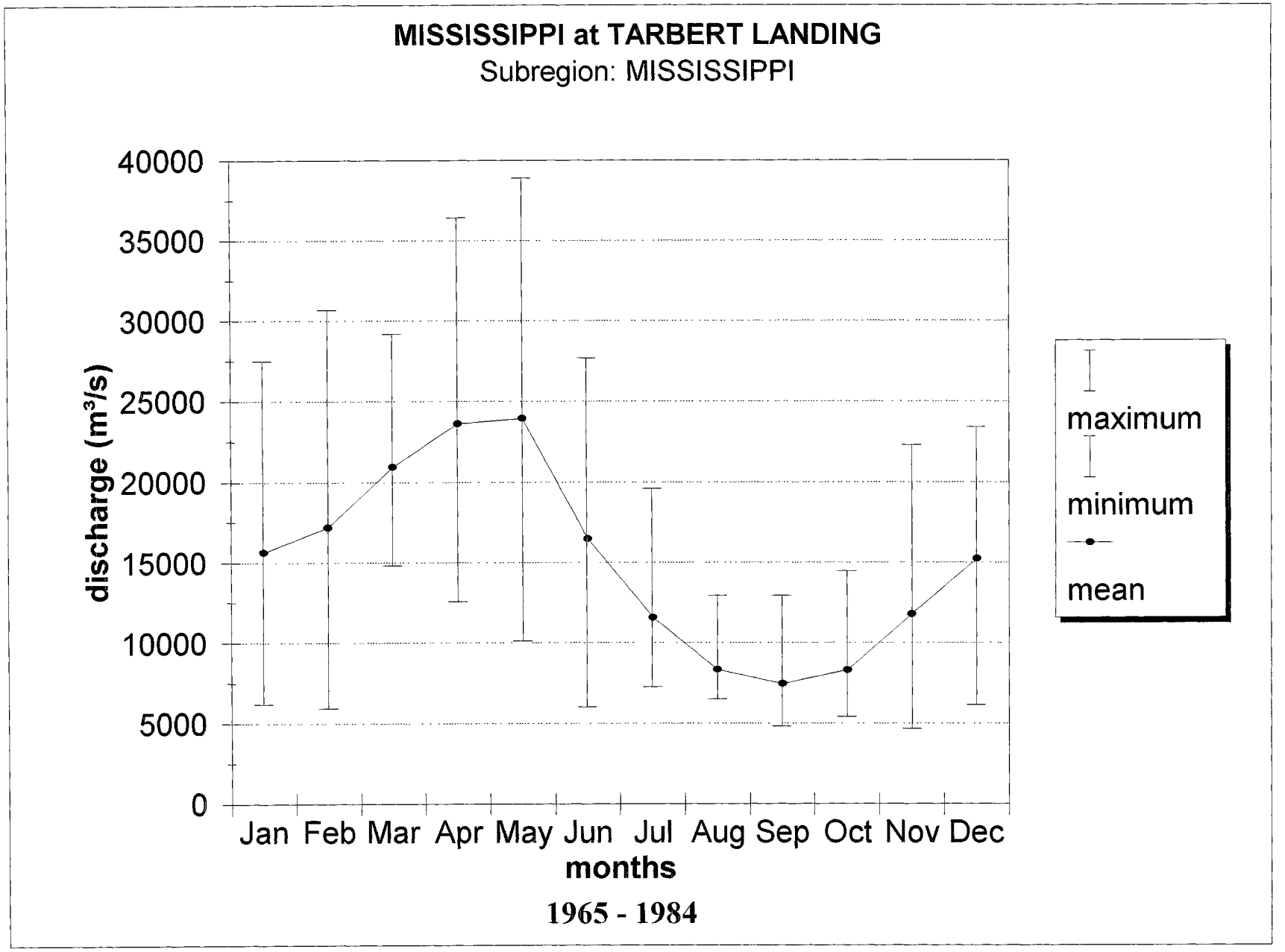
GLOBAL RUNOFF DATA CENTRE (GRDC)
20 LARGEST RIVERS

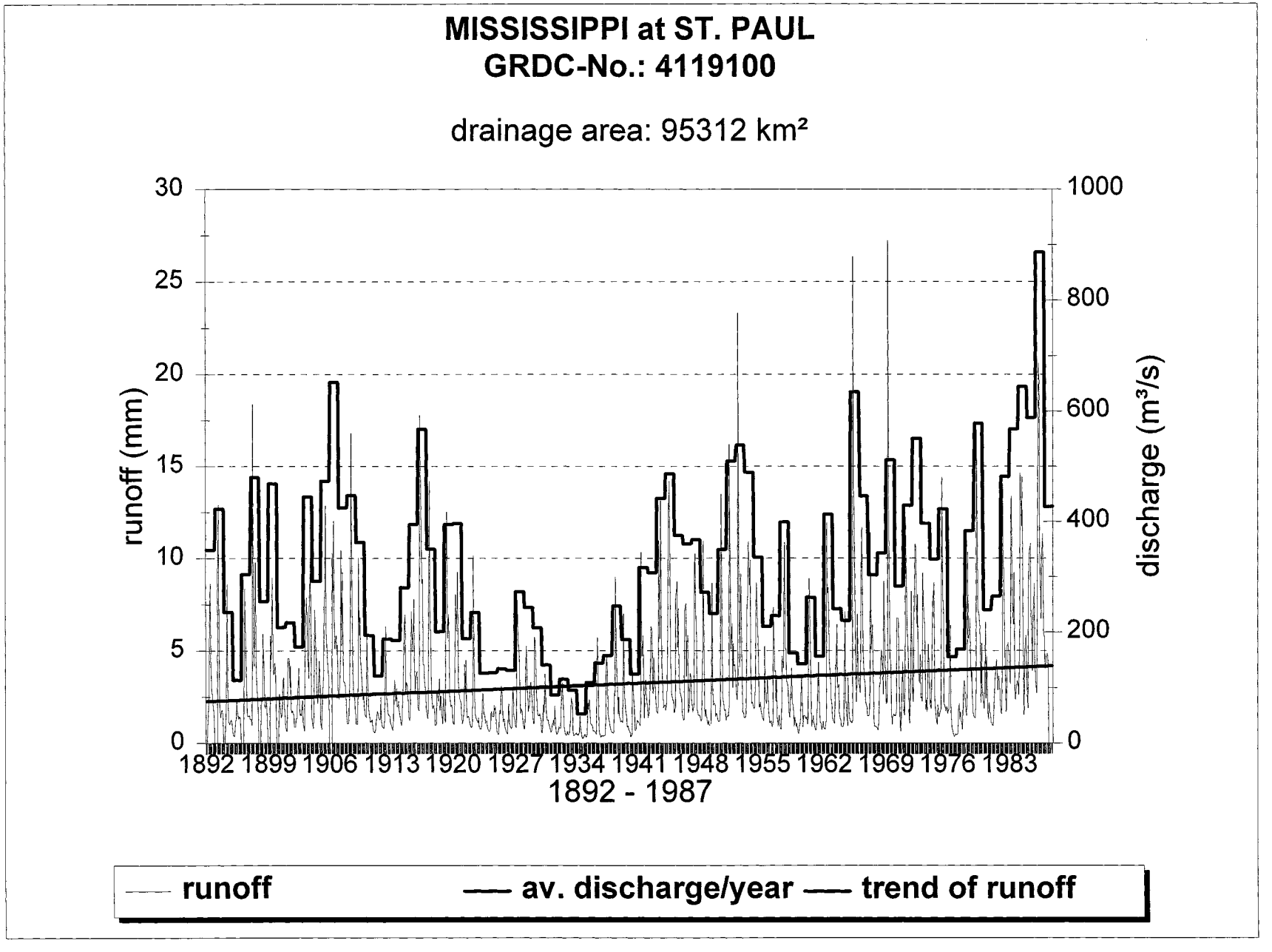
	MISSISSIPPI							table 1
No.	River	Station	Area (km²)	Latitude	Longitude	first rec.	last rec.	day/month
1	Mississippi	St.Paul	95312	4494N	9309W	3 1892	5 1987	D
2	Little Maquoketa River	near Durango Iowa	337	4255N	9075W	1 1978	2 1982	D
3	Des Plaines River	near Gurnee Ill.	601	4234N	8794W	1 1978	9 1990	D
4	Mississippi	Clinton Iowa	221704	4178N	9025W	1 1965	12 1984	M
5	Mississippi	Alton Ill.	444185	3888N	9018W	10 1927	12 1984	M
6	Missouri	Culbertson Mont.	237133	4812N	10448W	1 1965	12 1984	M
7	Yellowstone	Sidney Mont.	178977	4768N	10415W	1 1965	12 1984	M
8	Rock Creek	below Horse Creek	839	4897N	10682W	3 1978	12 1989	D
9	Missouri	Yankton S.D.	273905	4287N	9740W	10 1930	12 1984	M
10	Platte	Louisville Nebr.	222222	4102N	9615W	1 1973	9 1984	M
11	Platte	South Bend Nebr.	221000	4103N	9630W	1 1965	12 1972	M
12	Missouri	Nebraska City Nebr.	1061899	4068N	9585W	1 1965	9 1984	M
13	Kansas	Desoto Kans.	154768	3898N	9497W	1 1973	12 1984	M
14	Kansas	Bonner Springs Kans.	155100	3905N	9488W	1 1965	12 1972	M
15	Missouri	Hermann Mo.	1357677	3872N	9143W	10 1897	9 1988	M
16	Ohio	Metropolis Ill.	525770	3715N	8873W	1 1928	12 1984	M
17	Tennessee	Paducah Ky.	104118	3702N	8828W	1 1965	9 1984	M
18	Cumberland	Smithland Ky.	46395	3715N	8840W	1 1965	12 1972	M
19	Cumberland	Grand River Ky.	45579	3702N	8822W	1 1973	12 1984	M
20	Skillet Fork	Wayne City Ill.	179	3835N	8858W	1 1981	9 1990	D
21	Skillet Fork	near Iuka Ill.	539	3852N	8873W	1 1978	10 1982	D
22	Little Wabash River	below Clay City Ill.	2929	3863N	8830W	1 1978	9 1990	D
23	Bonpas Creek	Browns Ill.	591	3839N	8798W	1 1978	9 1990	D
24	Wabash	Mount Carmel Ill.	74165	3840N	8775W	1 1965	9 1984	M
25	Big Creek	near Wadesville Ind.	269	3808N	8777W	1 1978	12 1990	D
26	Ohio	Louisville Ky.	236130	3828N	8580W	1 1965	9 1984	M
27	Muscatatuck River	near Deputy Ind.	759	3880N	8567W	1 1978	12 1990	D
28	Whitewater River	near Alpine Ind.	1370	3958N	8516W	1 1978	12 1990	D
29	Little Miami River	near Spring Valley Ohio	948	3958N	8403W	1 1978	9 1985	D
30	Tug Fork	Litwar W.Va.	1308	3749N	8184W	1 1978	8 1985	D
31	Little Coal River	Danville W.Va.	699	3806N	8184W	1 1978	9 1984	D

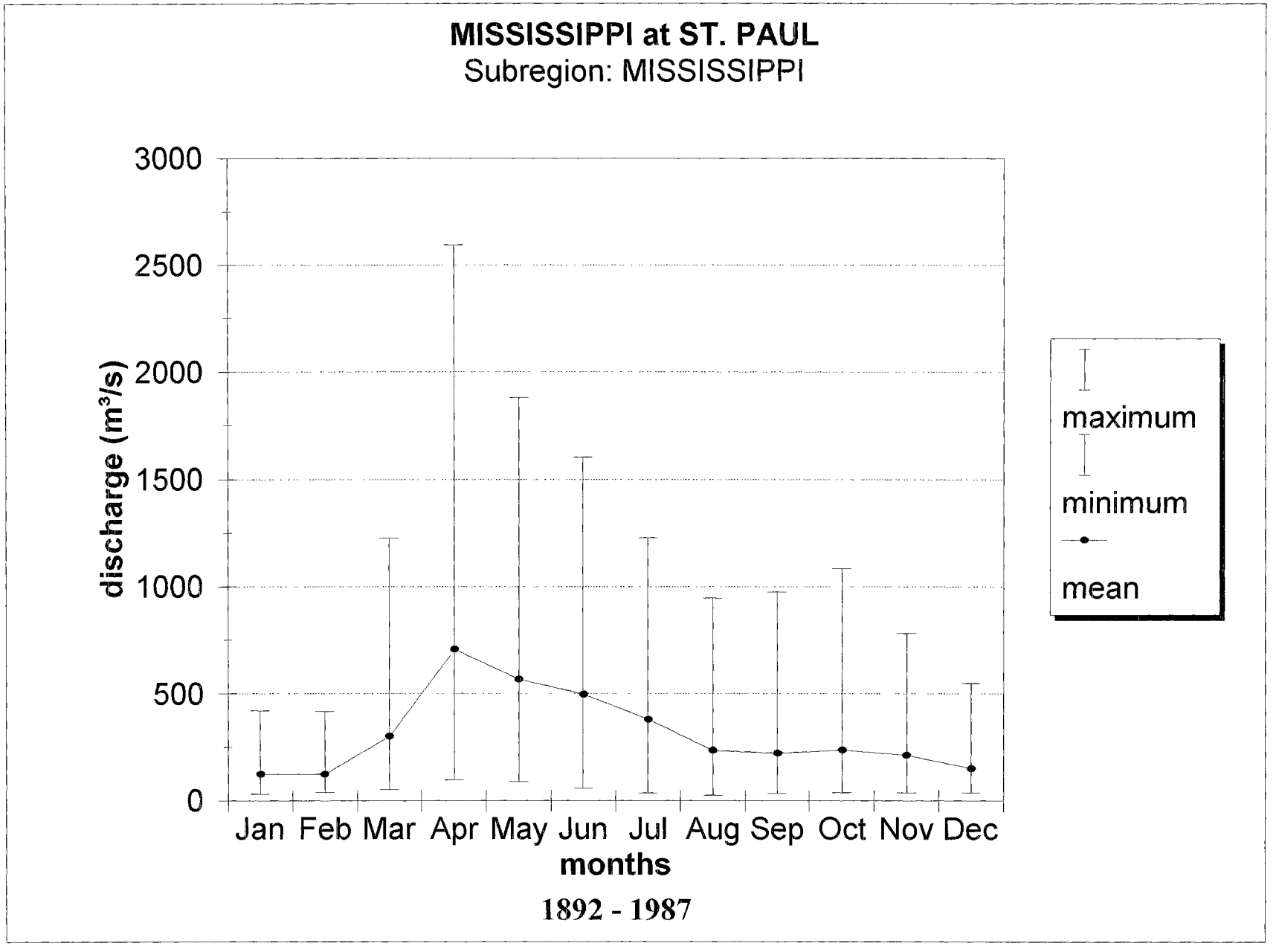
GLOBAL RUNOFF DATA CENTRE (GRDC)
20 LARGEST RIVERS

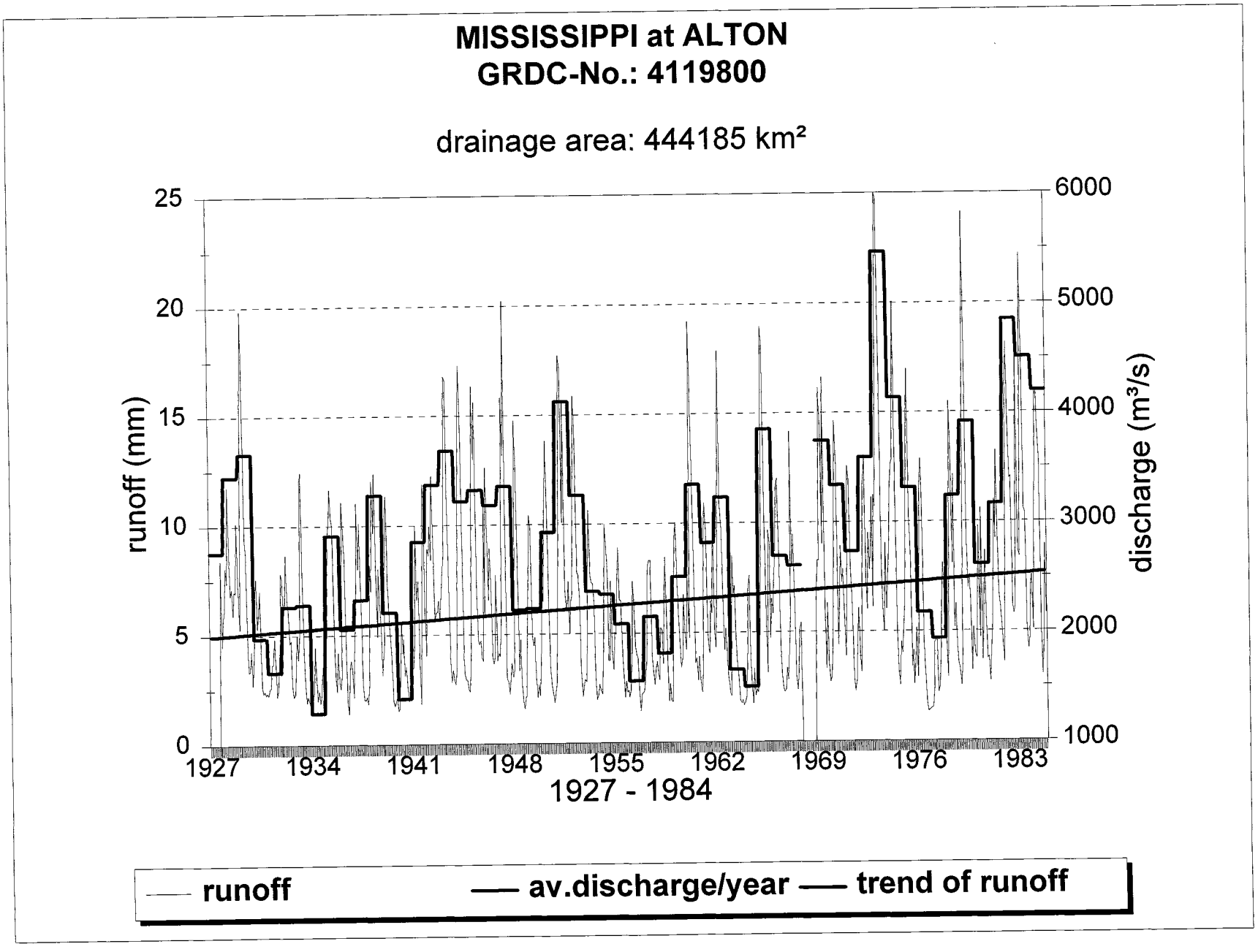
	MISSISSIPPI							table 2
No.	**River**	**Station**	**Area (km²)**	**Latitude**	**Longitude**	**first rec.**	**last rec.**	**day/month**
32	Arkansas	Tulsa Okla.	193253	3615N	9600W	1 1965	12 1984	M
33	Canadian	Whitefield Okla.	123222	3527N	9523W	1 1965	12 1984	M
34	Arkansas	Little Rock Ark.	409453	3475N	9227W	10 1927	12 1984	M
35	White	Devalls Bluff Ark.	60686	3478N	9145W	1 1965	9 1970	M
36	Quachita	Monroe La.	39622	3250N	9213W	1 1965	12 1975	M
37	Red	Alexandria La.	174825	3132N	9245W	10 1928	9 1983	M
38	Mississippi	Vicksburg Miss.	2964252	3232N	9090W	1 1965	9 1983	M
39	Homochitto River	Rosetta Miss.	1940	3132N	9111W	1 1978	9 1990	D
40	Buffalo River	near Woodville Miss.	471	3123N	9130W	1 1978	9 1990	D
41	**Mississippi**	**Tarbert Landing Miss.**	**3923799**	**3102N**	**9162W**	**1 1965**	**12 1984**	M
	Mississippi&atchfalaya	Red River Landing & Simmesport				1 1928	12 1964	M
42	Amite River	near Darlington La.	1504	3089N	9084W	1 1978	9 1990	D
43	Tickfaw River	Holden La.	640	3050N	9068W	1 1978	9 1990	D

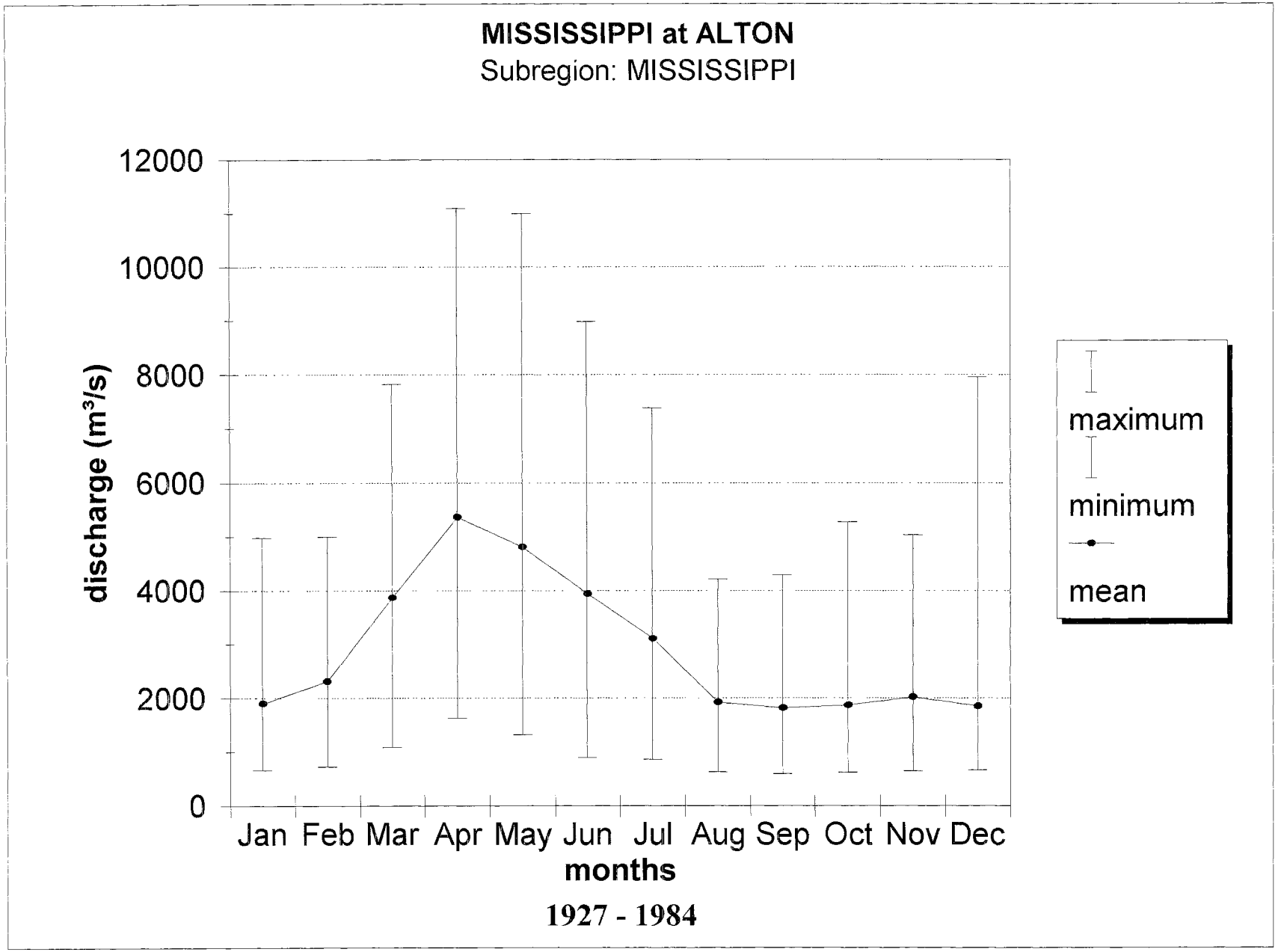

MISSISSIPPI at TARBERT LANDING
GRDC-No.: 4127930
drainage area: 3923799 km²
runoff (mm)
discharge (m³/s)
10
8
6
4
2
0
22000
20000
18000
16000
14000
12000
10000
1965
1968
1971
1974
1977
1980
1983
1965 - 1983
runoff
av. discharge/year

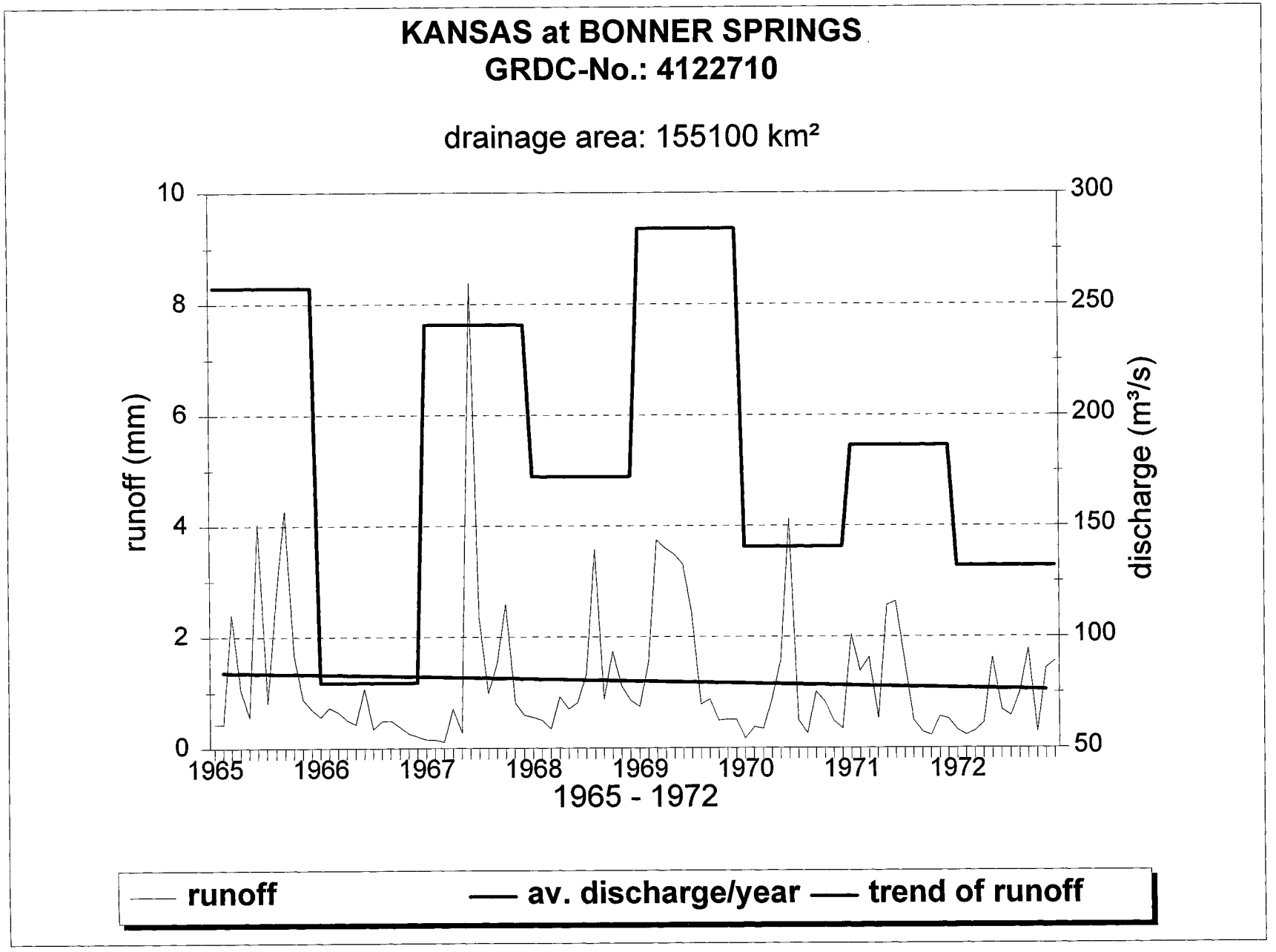

MISSISSIPPI at TARBERT LANDING
Subregion: MISSISSIPPI
discharge (m³/s)
40000
35000
30000
25000
20000
15000
10000
5000
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
maximum
minimum
mean
1965 - 1984

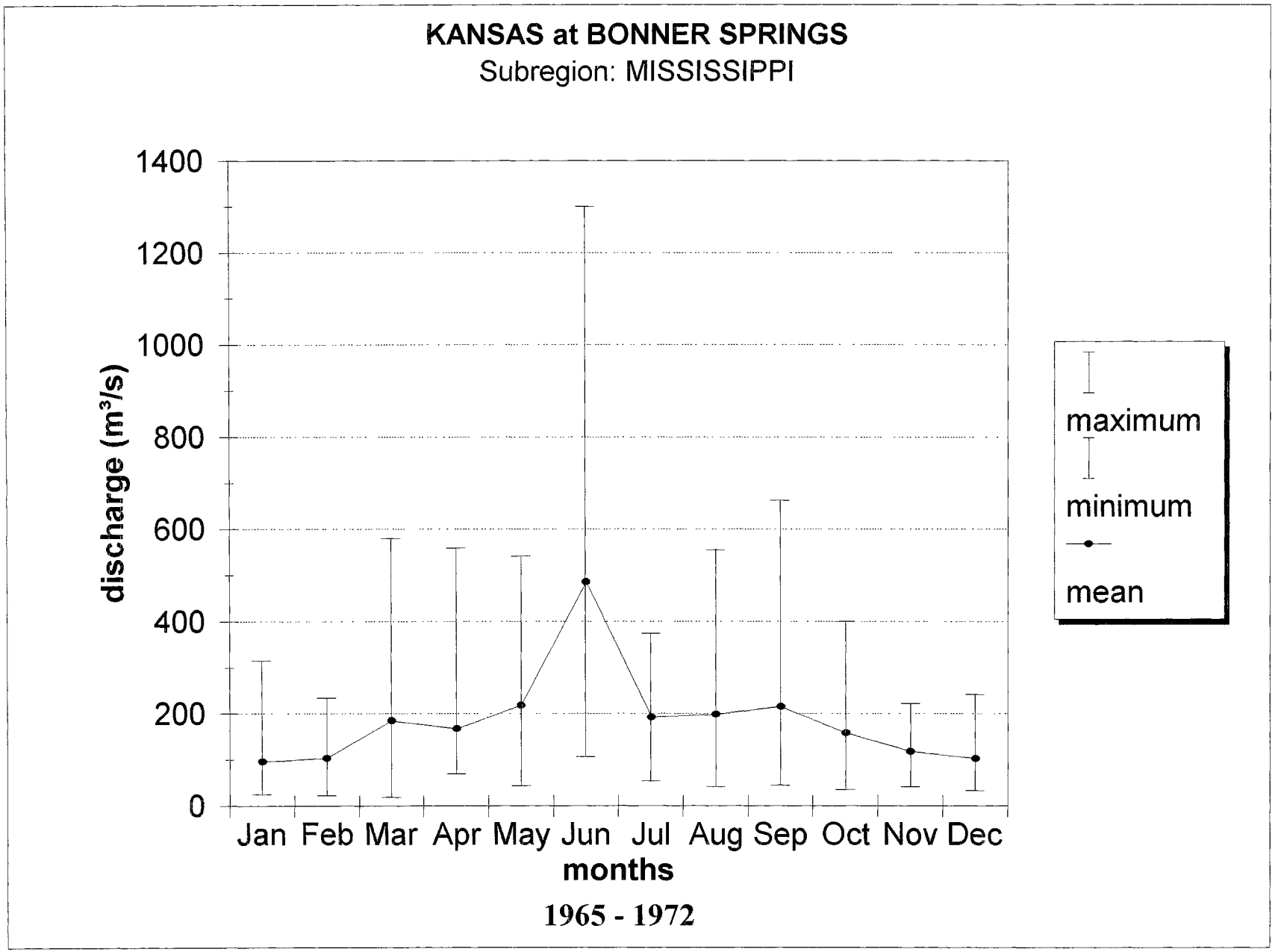

MISSISSIPPI at ST. PAUL
GRDC-No.: 4119100
drainage area: 95312 km²
runoff (mm)
discharge (m³/s)
30
25
20
15
10
5
0
1000
800
600
400
200
0
1892 1899 1906 1913 1920 1927 1934 1941 1948 1955 1962 1969 1976 1983
1892 - 1987
runoff
av. discharge/year
trend of runoff

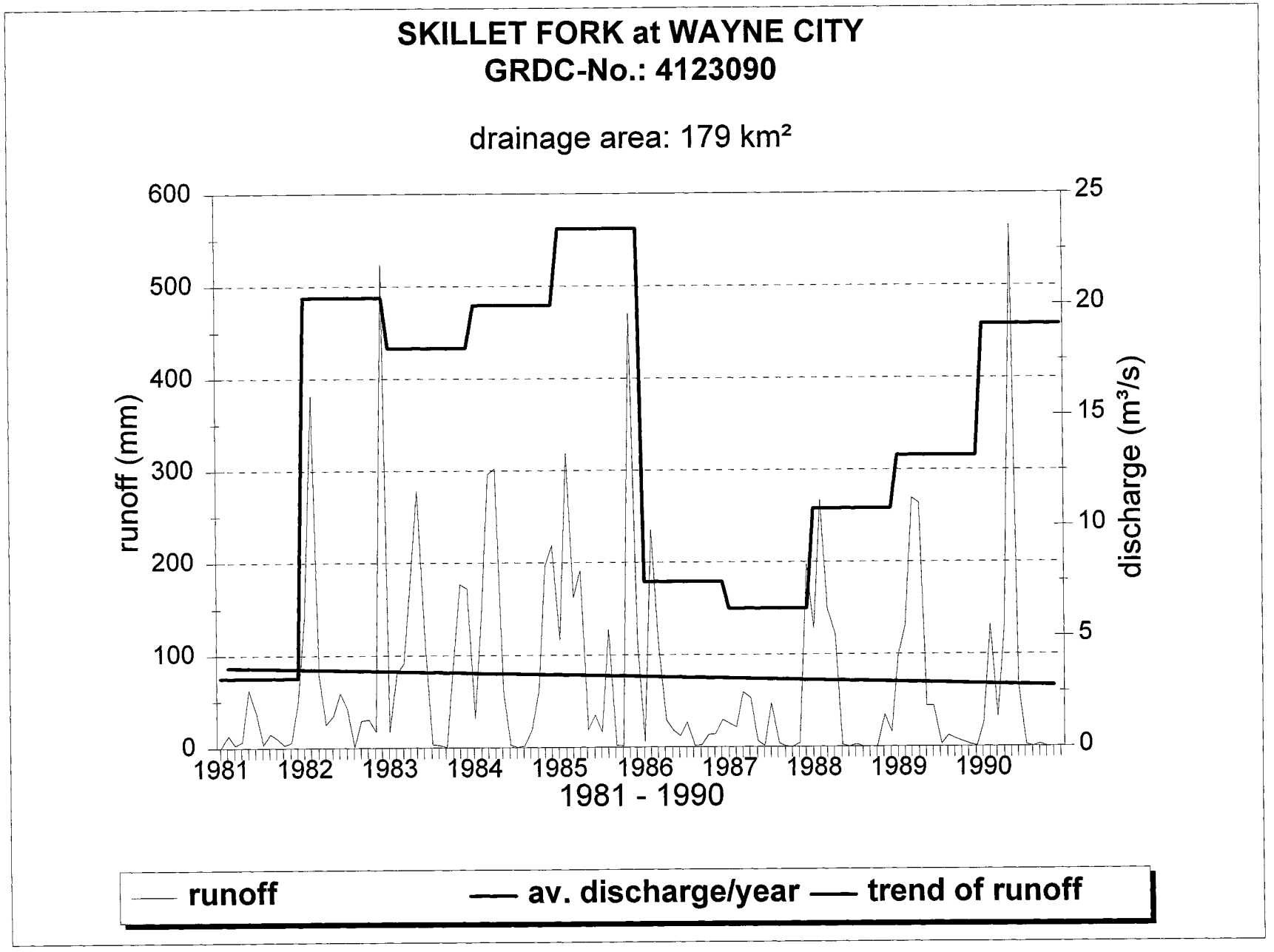

MISSISSIPPI at ST. PAUL
Subregion: MISSISSIPPI
discharge (m³/s)
3000
2500
2000
1500
1000
500
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1892 - 1987
maximum
minimum
mean

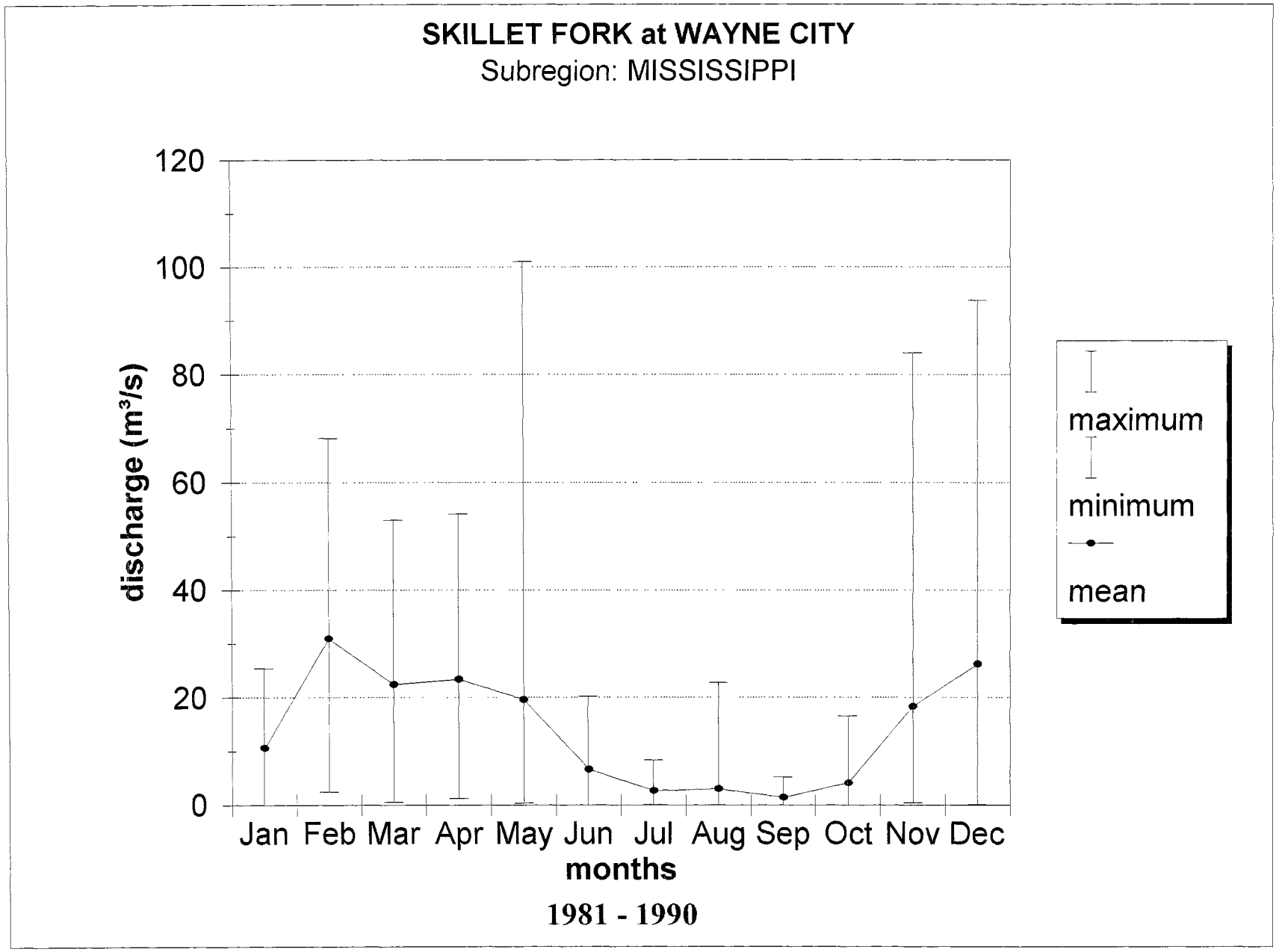

MISSISSIPPI at ALTON
GRDC-No.: 4119800
drainage area: 444185 km²
runoff (mm)
discharge (m³/s)
0
5
10
15
20
25
1000
2000
3000
4000
5000
6000
1927
1934
1941
1948
1955
1962
1969
1976
1983
1927 - 1984
runoff
av.discharge/year
trend of runoff

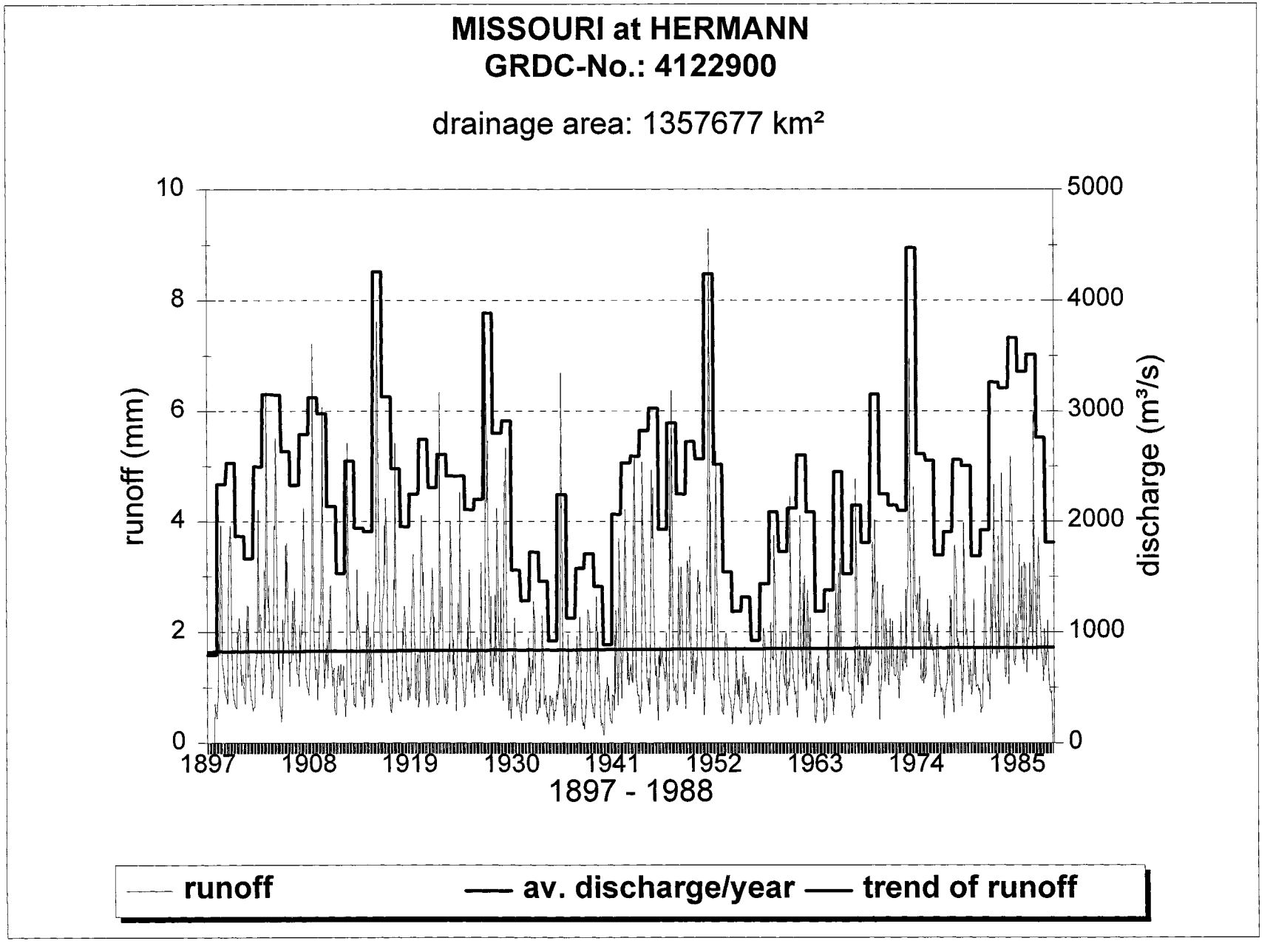

MISSISSIPPI at ALTON
Subregion: MISSISSIPPI
12000
10000
8000
6000
4000
2000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
maximum
minimum
mean
1927 - 1984

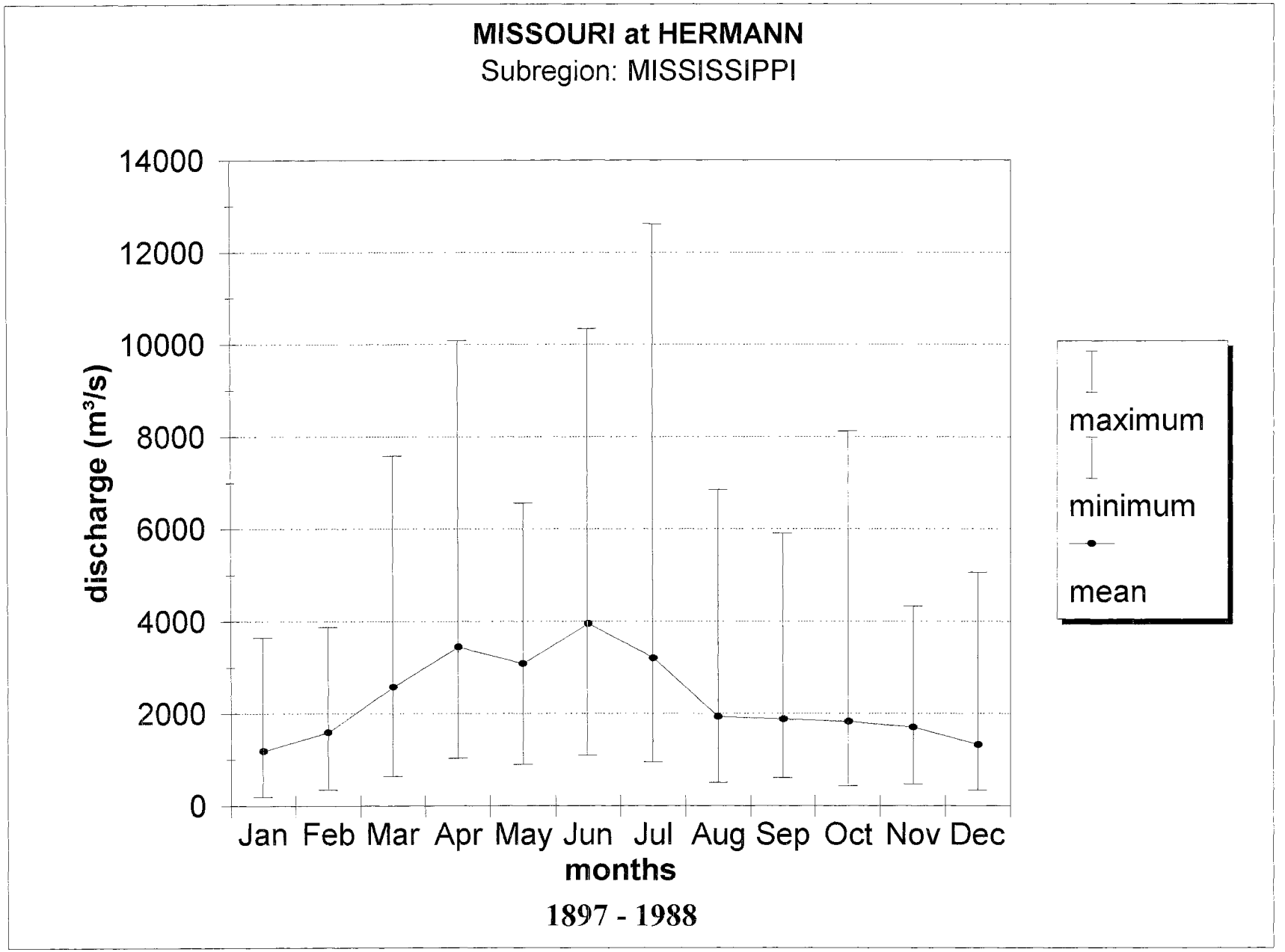

KANSAS at BONNER SPRINGS
GRDC-No.: 4122710
drainage area: 155100 km²
runoff (mm)
discharge (m³/s)
10
8
6
4
2
0
300
250
200
150
100
50
1965
1966
1967
1968
1969
1970
1971
1972
1965 - 1972
runoff
av. discharge/year
trend of runoff

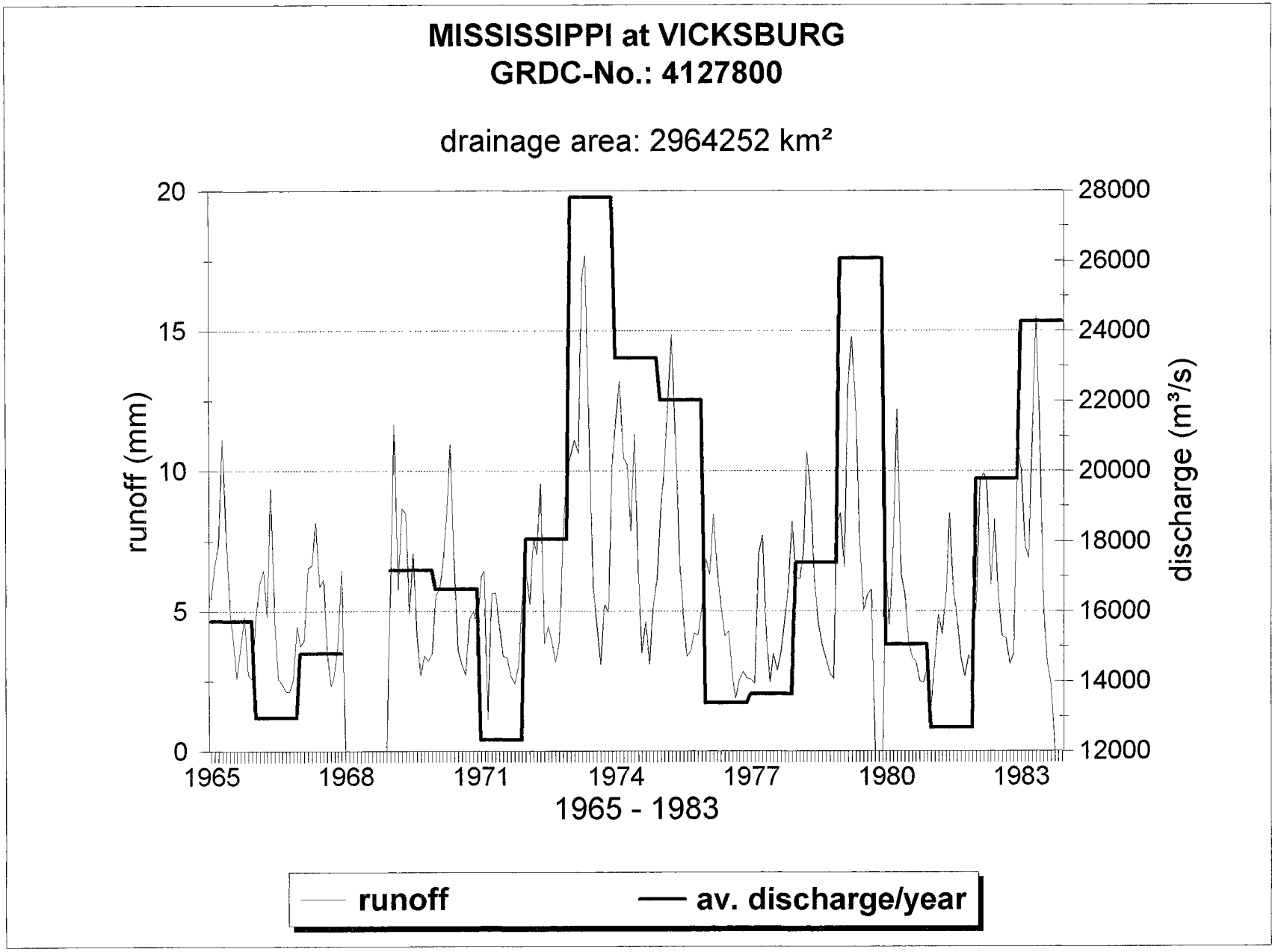

KANSAS at BONNER SPRINGS
Subregion: MISSISSIPPI
1400
1200
1000
800
600
400
200
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
maximum
minimum
mean
1965 - 1972

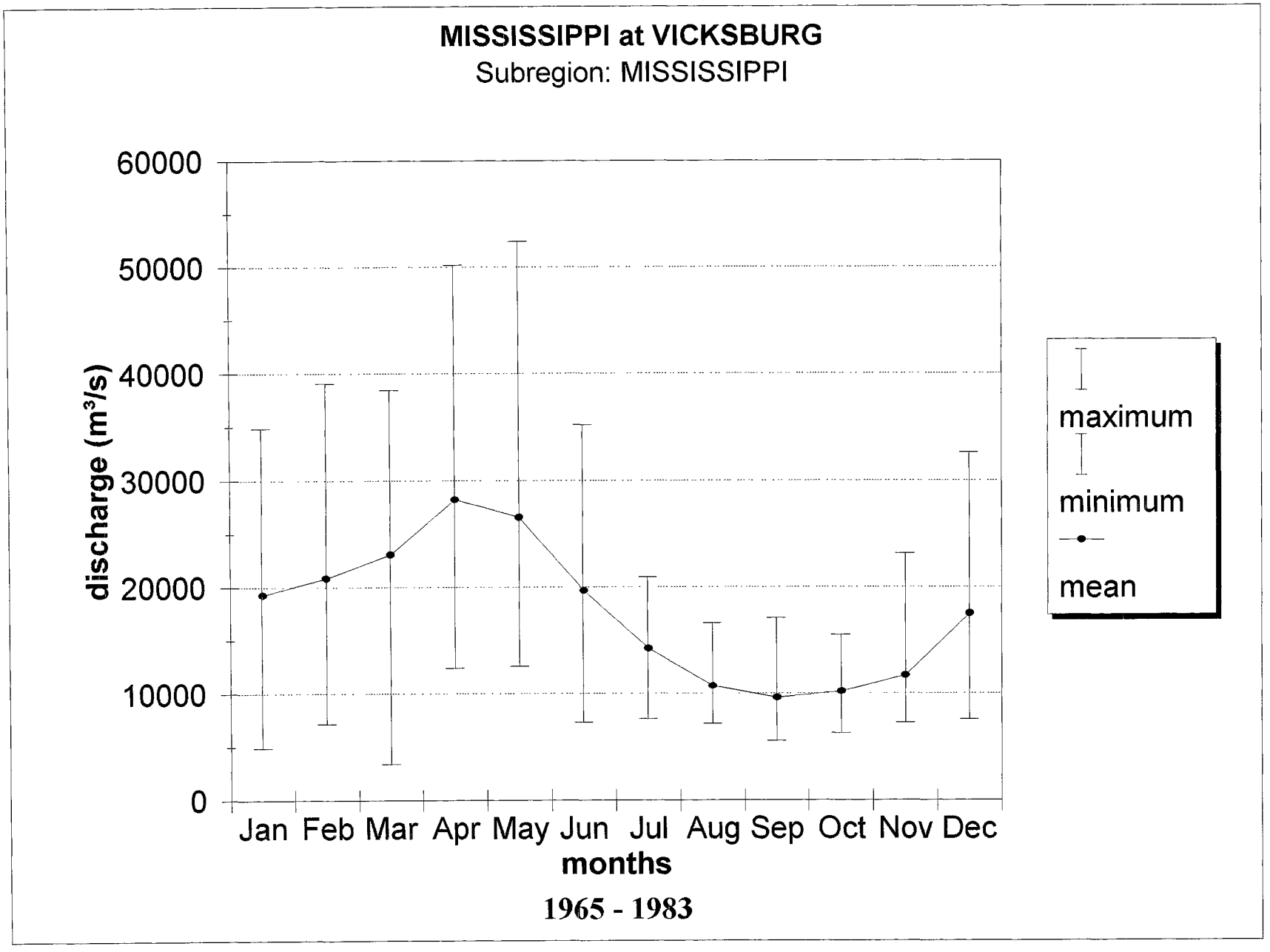

SKILLET FORK at WAYNE CITY
GRDC-No.: 4123090
drainage area: 179 km²
runoff (mm)
discharge (m³/s)
600
500
400
300
200
100
0
25
20
15
10
5
0
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1981 - 1990
runoff
av. discharge/year
trend of runoff

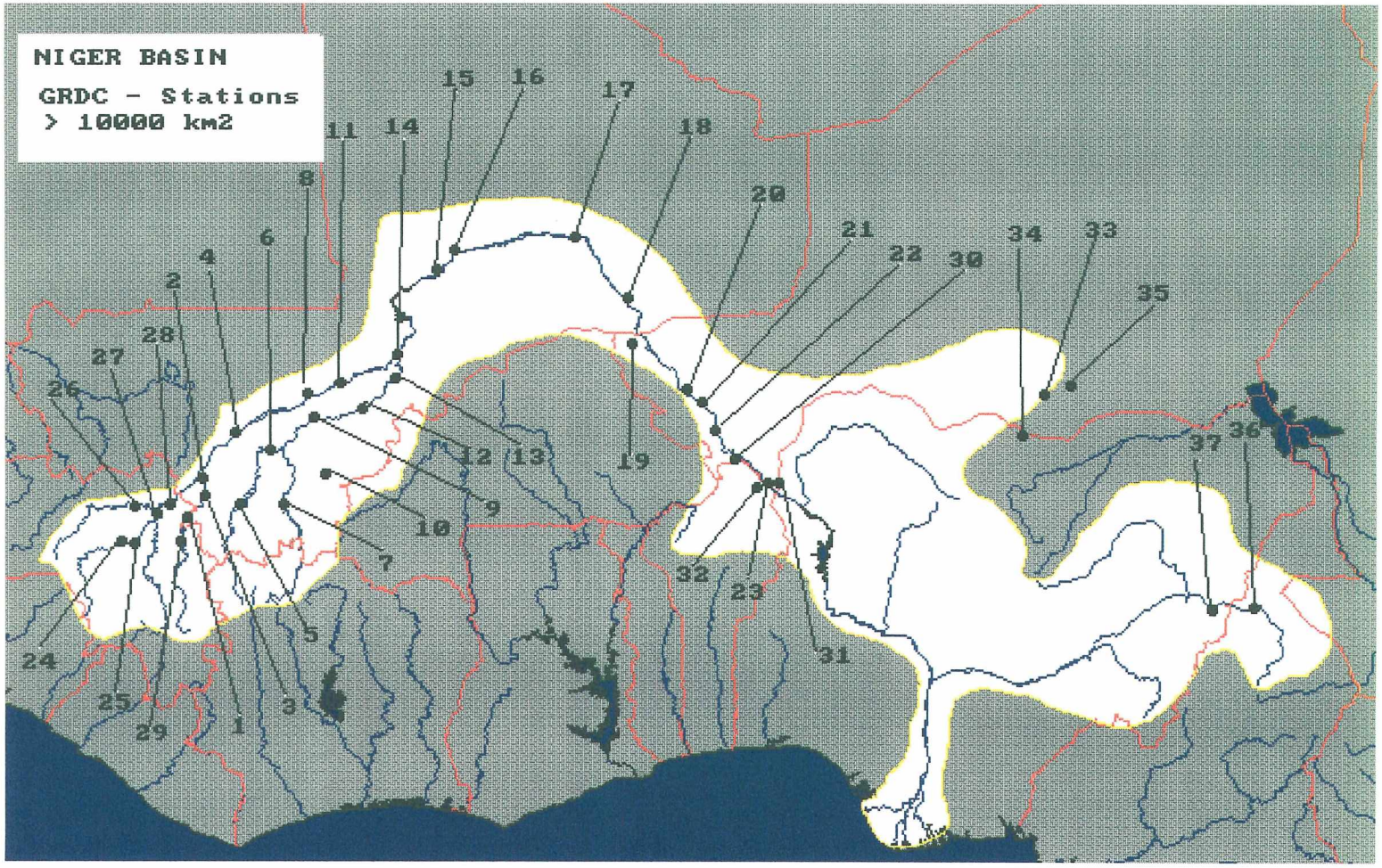

SKILLET FORK at WAYNE CITY
Subregion: MISSISSIPPI
120
100
80
60
40
20
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1981 - 1990
maximum
minimum
mean


MISSOURI at HERMANN
GRDC-No.: 4122900
drainage area: 1357677 km²
runoff (mm)
discharge (m³/s)
10
8
6
4
2
0
5000
4000
3000
2000
1000
0
1897
1908
1919
1930
1941
1952
1963
1974
1985
1897 - 1988
runoff
av. discharge/year
trend of runoff


MISSOURI at HERMANN
Subregion: MISSISSIPPI
14000
12000
10000
8000
6000
4000
2000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
maximum
minimum
mean
1897 - 1988


MISSISSIPPI at VICKSBURG
GRDC-No.: 4127800
drainage area: 2964252 km²
runoff (mm)
discharge (m³/s)
0
5
10
15
20
12000
14000
16000
18000
20000
22000
24000
26000
28000
1965
1968
1971
1974
1977
1980
1983
1965 - 1983
runoff
av. discharge/year


MISSISSIPPI at VICKSBURG
Subregion: MISSISSIPPI
60000
50000
40000
30000
20000
10000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
maximum
minimum
mean
1965 - 1983


NIGER BASIN
GRDC - Stations
> 10000 km2
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37

GLOBAL RUNOFF DATA CENTRE (GRDC)
20 LARGEST RIVERS

	NIGER							table 1
No.	River	Station	Area (km²)	Latitude	Longitude	first rec.	last rec.	day/month
1	Sankarani	Guelelinkoro	23300	1115N	855W	6 1971	12 1979	D
	Niger	Banankoro	7175	1168N	867W	9 1967	12 1990	D
2	Sankarani	Gouala	35300	1197N	823W	3 1954	12 1990	D
2	Sankarani	Gouala	35300	1197N	823W	4 1954	12 1990	M
3	Sankarani	Selingue	34200	1158N	817W	6 1964	12 1990	D
3	Sankarani	Selingue	34200	1158N	817W	7 1964	12 1990	M
	Ouassoulou	Yanfolila	4100	1113N	820W	5 1971	12 1979	D
	Baoule	Madina Diassa	7900	1080N	767W	11 1971	12 1990	D
4	Niger	Koulikoro	120000	1287N	755W	1 1907	12 1990	D
4	Niger	Koulikoro	120000	1287N	755W	1 1907	12 1990	M
5	Baoule	Bougouni	15700	1140N	745W	3 1956	12 1990	D
	Banifing	Kolondieba	3050	1107N	685W	1 1972	12 1990	D
6	Baoule	Dioila	32500	1252N	680W	5 1953	12 1990	D
6	Baoule	Dioila	32500	1252N	680W	6 1953	12 1990	M
7	Bagoe	Pankourou	31800	1142N	657W	3 1956	12 1990	D
7	Bagoe	Pankourou	31800	1142N	657W	6 1956	12 1990	M
8	Niger	Kirango aval	137000	1372N	605W	1 1925	12 1990	D
8	Niger	Kirango aval	137000	1372N	605W	1 1925	12 1990	M
9	Bani	Douna	101600	1322N	590W	5 1922	12 1990	D
9	Bani	Douna	101600	1322N	590W	5 1922	12 1990	M
10	Banifing	Kouoro 2	14300	1202N	568W	6 1975	12 1990	D
10	Banifing	Kouoro 1				6 1957	9 1979	D
	Lotio	Klela	3685	1168N	558W	8 1976	12 1979	D
11	Niger	Ke-Macina	141000	1395N	537W	1 1953	12 1990	D
	Diaka	Kara		1417N	502W	5 1952	12 1990	D
12	Bani	Beneny-Kegny	116000	1338N	492W	7 1951	12 1990	D
	Niger	Tilembeya	143300			6 1922	12 1990	D
13	Bani	Sofara	129000	1402N	425W	1 1952	12 1990	D
14	Niger	Mopti	281600	1453N	422W	1 1922	12 1990	D
14	Niger	Mopti	281600	1453N	422W	6 1922	12 1975	M
	Bani	Mopti				1 1987	12 1987	D

GLOBAL RUNOFF DATA CENTRE (GRDC)
20 LARGEST RIVERS

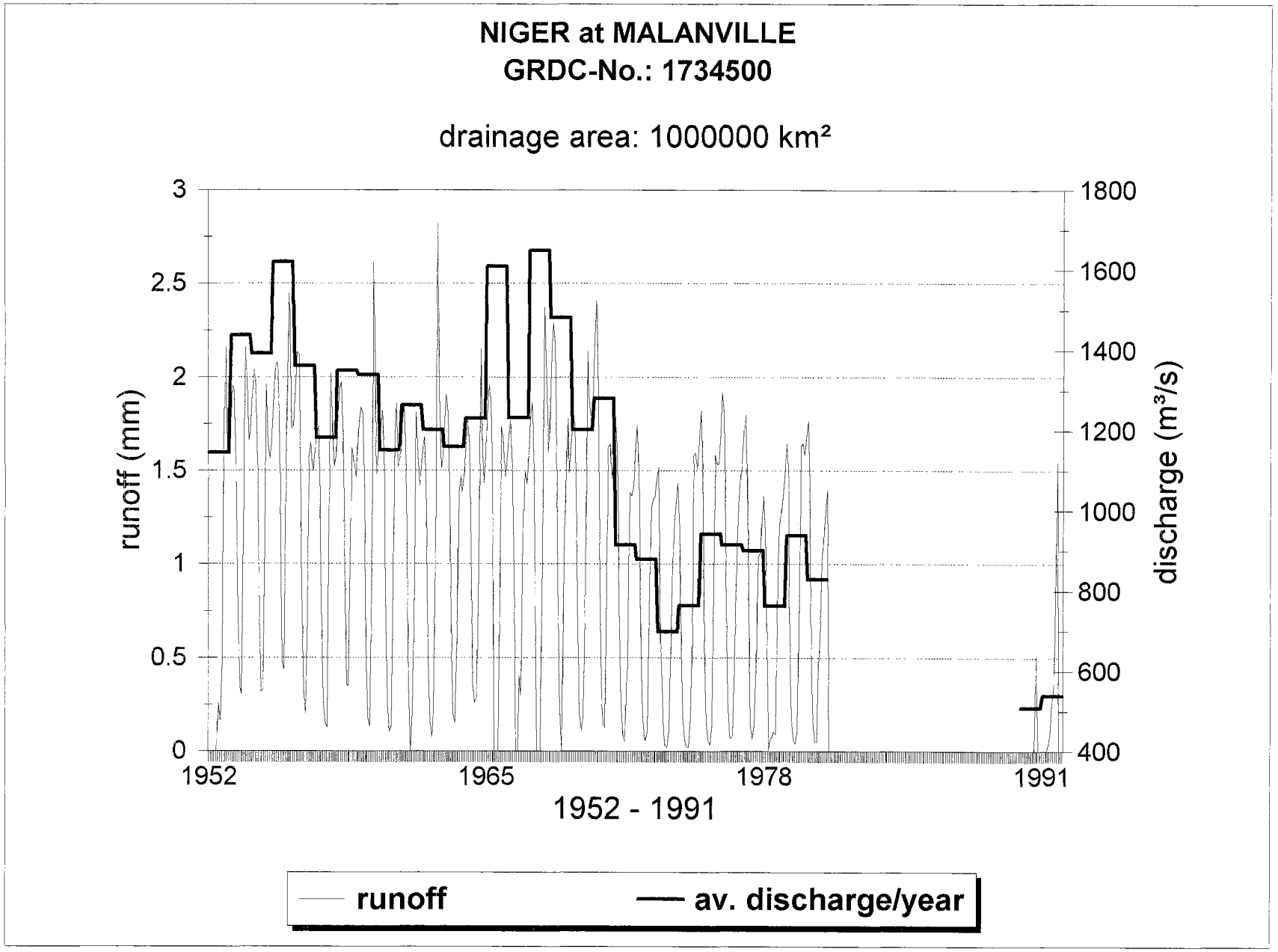
	NIGER							table 2
No.	River	Station	Area (km²)	Latitude	Longitude	first rec.	last rec.	day/month
	Bani	Mopti				1 1944	12 1988	M
	Issa Ber	Akka		1540N	423W	1 1987	12 1990	D
	Tassakan	Goundam		1642N	365W	7 1931	12 1990	D
	Niger (Issa Ber)	Tonka		1613N	375W	7 1954	12 1990	D
	Bara-Issa	Sarafere		1582N	370W	6 1954	12 1990	D
15	Niger	Dire	340000	1627N	338W	1 1924	12 1990	D
15	Niger	Dire	340000	1627N	338W	1 1924	12 1990	M
	Issa Ber	Dire				1 1924	12 1988	M
16	Niger	Koryoume	342000	1667N	303W	8 1963	12 1990	D
17	Niger	Tossaye	348000	1693N	058W	6 1954	12 1990	D
18	Niger	Ansongo	566000	1567N	050E	10 1950	12 1990	D
18	Niger	Ansongo	566000	1567N	050E	1 1951	12 1990	M
	Garouol	Dolbel	7500	1462N	030E	1 1961	12 1982	D
19	Gorouol	Alcongui	44900	1475N	060E	1 1961	11 1980	D
19	Gorouol	Alcongui	44900	1475N	060E	4 1957	9 1989	M
	Niger	Kandadji		1457N	100E	1 1975	12 1980	D
	Dargol	Tera	2750	1402N	075E	1 1961	12 1979	D
	Dargol	Kakassi	6940	1385N	147E	1 1957	12 1982	D
20	Sirba	Garbe-Kourou	38750	1378N	166E	1 1956	11 1980	D
21	Niger	Niamey	700000	1352N	208E	1 1929	4 1991	D
21	Niger	Niamey	700000	1352N	208E	1 1929	9 1991	M
22	Goroubi	Diongore amont	15350	1296N	232E	8 1962	11 1980	D
	Diamangou	Tamou	4030	1274N	224E	8 1962	11 1980	D
	Tapoa	W	5330	1247N	242E	5 1963	12 1982	D
23	Niger	Gaya	1000000	1188N	340E	7 1952	9 1990	M
	Maggia	Tsernaoua	2525	1388N	533E	1 1976	12 1983	D
	Kori de Badeguicheri	Badeguicheri	824	1450N	537E	1 1976	12 1979	D
	Goulbi de Maradi	Guindam Roumdji	8800	1367N	677E	1 1976	12 1979	D
	Goulbi de Maradi	Madarounfa	5400	1332N	717E	1 1976	12 1979	D
	Goulbi de Maradi	Madarounfa	5400	1332N	717E	7 1956	12 1979	M
	Goulbi de Maradi	Nielloua	4800	1315N	722E	1 1976	12 1982	D

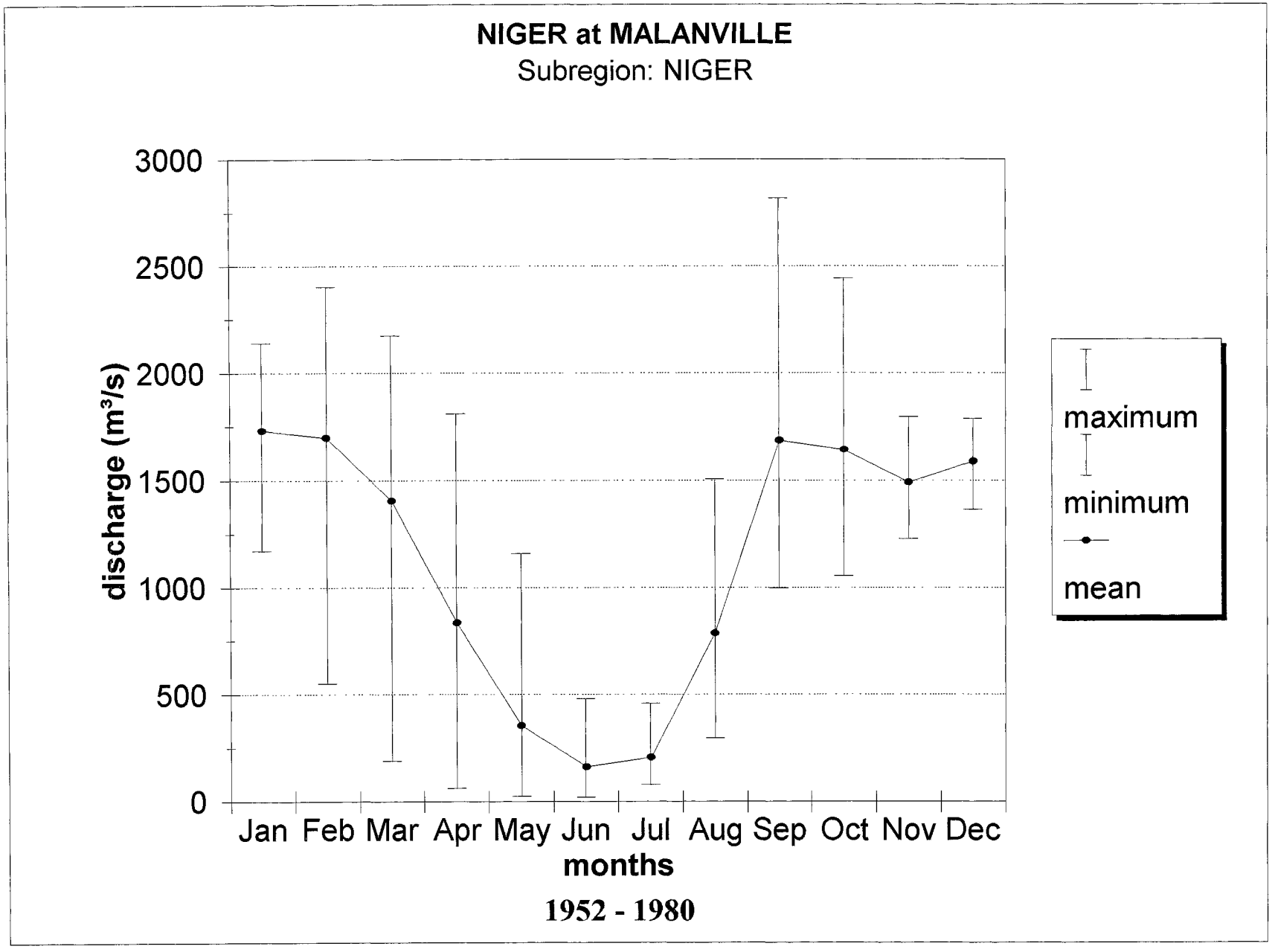
GLOBAL RUNOFF DATA CENTRE (GRDC)
20 LARGEST RIVERS

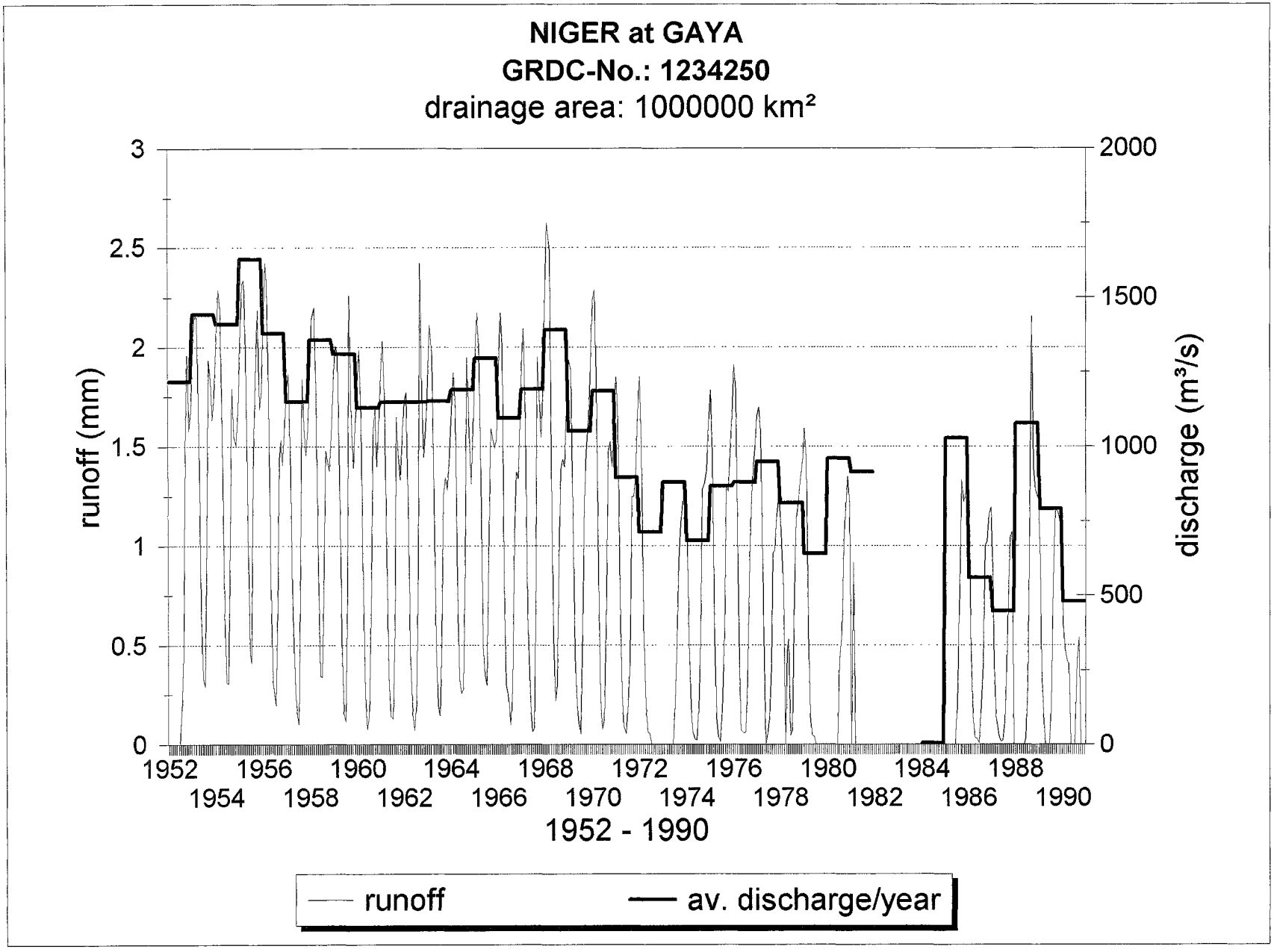
	NIGER							table 3
No.	River	Station	Area (km²)	Latitude	Longitude	first rec.	last rec.	day/month
	Kouroukele	Iradougou	2000	970N	779W	7 1962	12 1980	D
	Baoule	Djirila	3970	1006N	758W	9 1962	7 1977	D
	Baoule	Samatiguila	1800	984N	757W	1 1962	12 1980	D
	Banifing	Ziemougoula	990	991N	742W	7 1962	12 1980	D
	Degou	Manankoro	1570	944N	745W	6 1975	12 1980	D
	Doundian	Wahire	640	909N	691W	1 1976	12 1980	D
	Mahandiabani	Wahire	810	909N	693W	1 1976	12 1980	D
	Kankelaba	Debete	5550	956N	667W	7 1975	12 1982	D
	Bagoe	Guinguerini	1050	938N	660W	3 1955	12 1980	D
	Niangboue	Ponondougou	700	951N	636W	3 1955	12 1980	D
	Bagoe	Tombougou 1	2580	965N	637W	3 1955	11 1968	D
	Bagoe	Tombougou 2				1 1963	12 1978	D
	Bagoe	Kouto aval	4700	985N	636W	6 1960	12 1980	D
	Bagoe	Kouto amont				1 1973	12 1979	D
	Bagoe	Papara	8900	1063N	622W	1 1976	12 1982	D
	Tinkisso	Dabola	1260	1075N	1112W	2 1964	7 1975	D
	Niger	Faranah	3180	1003N	1073W	6 1955	12 1979	D
	Niandan	Kissidougou	650	918N	1006W	7 1957	12 1978	D
24	Niger	Kouroussa	18000	1065N	988W	8 1923	7 1979	D
25	Niandan	Baro	12770	1060N	973W	5 1947	12 1979	D
	Niandan	Molokoro	12240			5 1952	12 1954	D
	Milo	Kankan	9620	1037N	930W	5 1938	12 1980	D
	Milo	Kankan	9620	1037N	930W	1 1976	12 1979	M
	Milo	Konsankoro	1000	903N	900W	3 1955	12 1980	D
	Milo	Kerouane		927N	902W	8 1970	12 1980	D
26	Tinkisso	Ouaran	18700	1137N	961W	5 1954	12 1978	D
	Tinkisso	Tinkisso				6 1955	12 1978	D
27	Niger	Tiguibery	70000	1125N	917W	5 1952	12 1979	D
28	Niger	Dialakoro	71000	1142N	891W	5 1954	12 1980	D
29	Sankarani	Mandiana	21900	1063N	868W	6 1954	12 1978	D

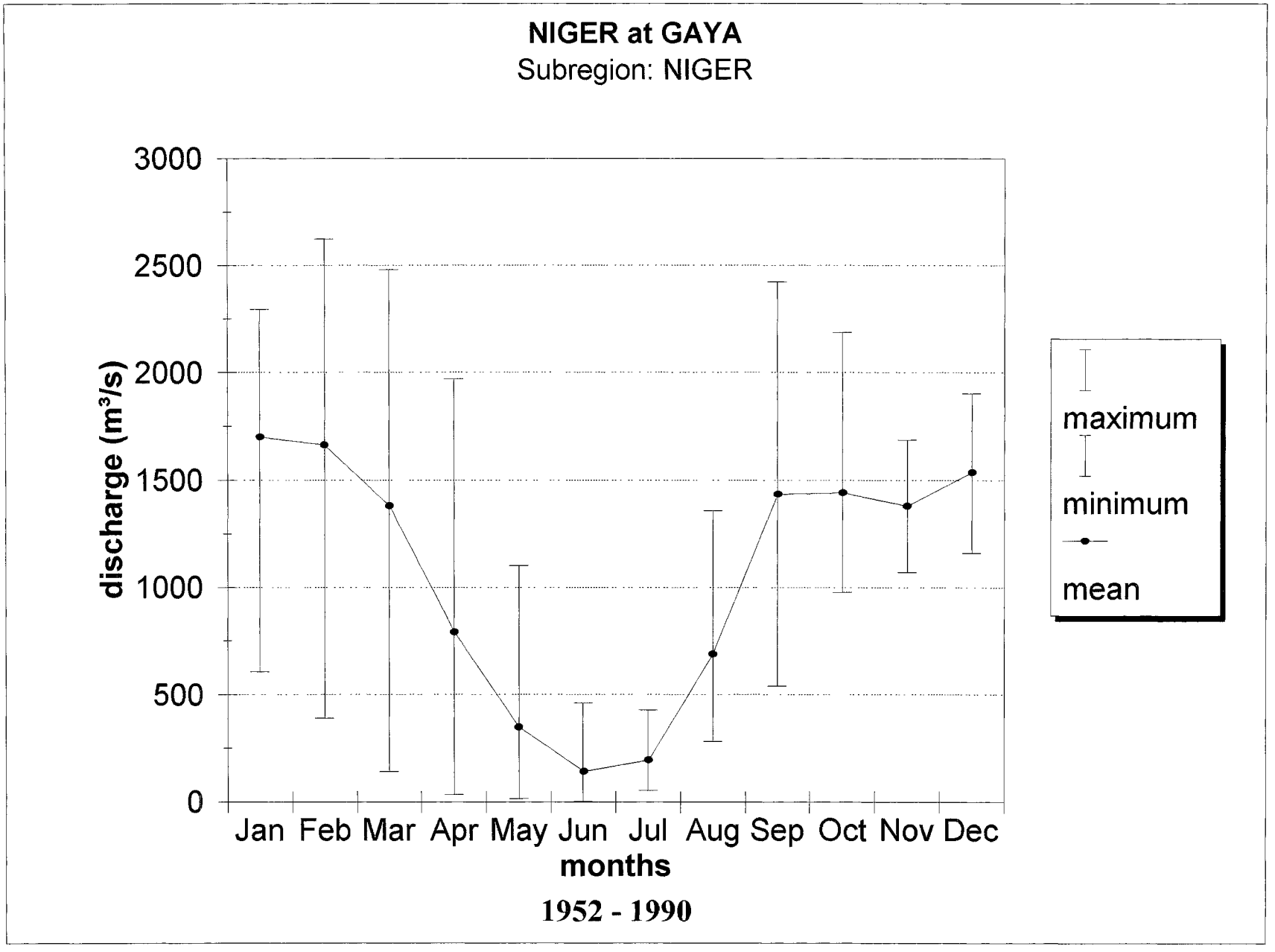
GLOBAL RUNOFF DATA CENTRE (GRDC)
20 LARGEST RIVERS

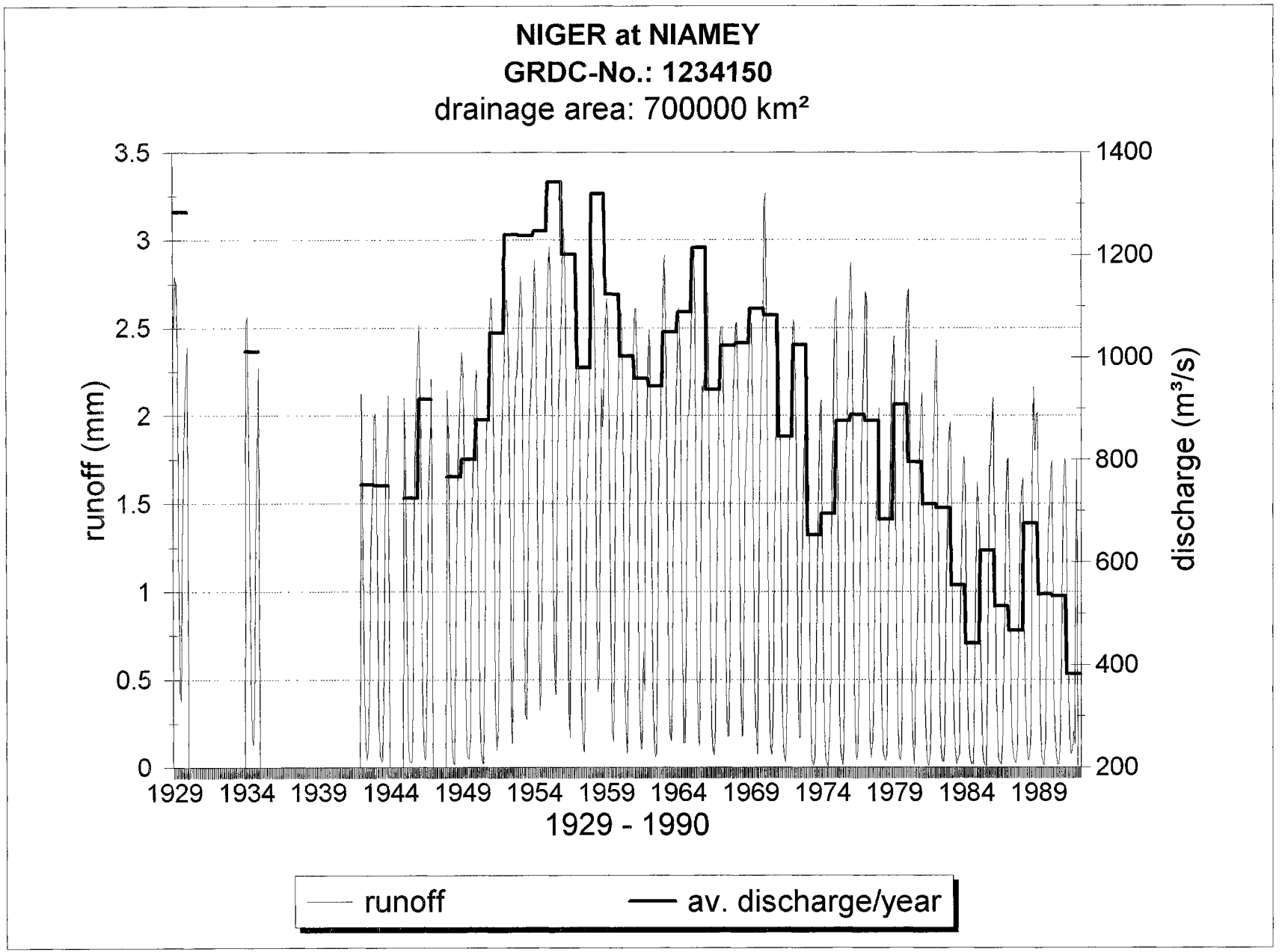
	NIGER							table 4
No.	River	Station	Area (km²)	Latitude	Longitude	first rec.	last rec.	day/month
	Mekrou	Kerou				9 1990	9 1991	D
	Mekrou	Kompongou	5670	1140N	218E	1 1960	9 1990	D
	Alibori	Route Kandi-Banikoara amont	8170	1123N	265E	7 1952	10 1965	D
	Alibori	Route Kandi-Banikoara aval	8170	1123N	265E	1 1962	9 1991	D
30	Mekrou	Barou	10500	1235N	273E	3 1961	1 1979	D
	Irane	Koutakoukrou	1250	1105N	305E	1 1953	9 1991	D
31	**Niger**	**Malanville**	**1000000**	**1187N**	**338E**	**6 1952**	**9 1991**	**D**
	Sota	Rte Kandi-Segbana aval	8298	1098N	325E	1 1973	12 1980	D
	Sota	Rte Kandi-Segbana amont	8298	1098N	325E	6 1952	12 1976	D
32	Sota	Couberi	13410	1175N	333E	5 1953	9 1991	D
	Niger	Jebba		918N	482E	1 1977	12 1977	M
	Goudebo	Yakouta	1640	1408N	013W	1 1978	12 1983	D
	Goudebo	Yakouta	1640	1408N	013W	3 1963	2 1986	M
	Gorouol	Koriziena	2500	1437N	003W	1 1964	2 1990	M
	Sirba	Bilanga	3451	1263N	003W	1 1974	2 1986	M
	Faga	Liptougou	15700	1268N	027W	1 1973	3 1988	M
	Diamangou	Botou	2994	1242N	015E	1 1980	2 1986	M
	Benoue	Buffle Noir	3220	1383N	812E	10 1955	12 1978	M
33	Benoue	Riao	30650	1368N	905E	7 1950	11 1980	M
34	Faro	Safaie	23500	1283N	860E	4 1953	6 1971	M
35	Mayo-Kebi	Cossi	25000	1387N	962E	1 1955	12 1979	M
	Mayo-Rey	Tchollire	5240	1425N	840E	1 1975	12 1979	M
	Mayo-Louti	Figuil	5550	1393N	977E	4 1974	11 1979	M
	Metchum	Gouri	2240	1003N	628E	3 1964	12 1980	M
36	Benoue	Garoua	64000	930N	1338E	8 1930	12 1980	M
	Kabia	Gounou-Gaya	3840	969N	1550E	5 1978	4 1990	D
	Kabia (Amont)	Pont Carol	2072	928N	1550E	5 1978	4 1990	D
	Donga	Donga		772N	000E	1 1977	12 1977	M
	Gongola	Dadin Kowa				1 1977	12 1977	M
37	Benue	Yola	107000	925N	1250E	1 1960	12 1989	M

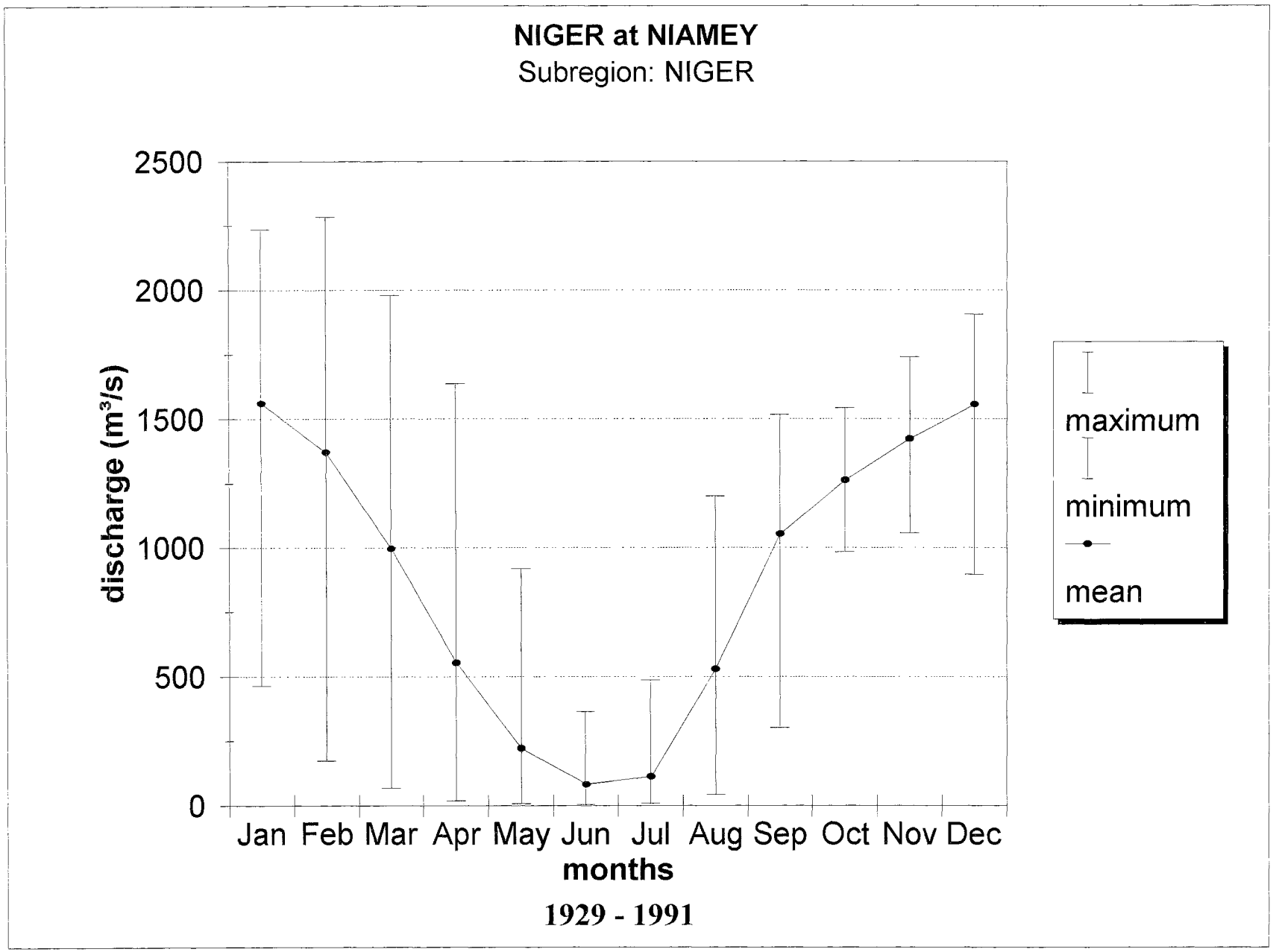

NIGER at MALANVILLE
GRDC-No.: 1734500
drainage area: 1000000 km²
runoff (mm)
discharge (m³/s)
3
2.5
2
1.5
1
0.5
0
1800
1600
1400
1200
1000
800
600
400
1952
1965
1978
1991
1952 - 1991
runoff
av. discharge/year

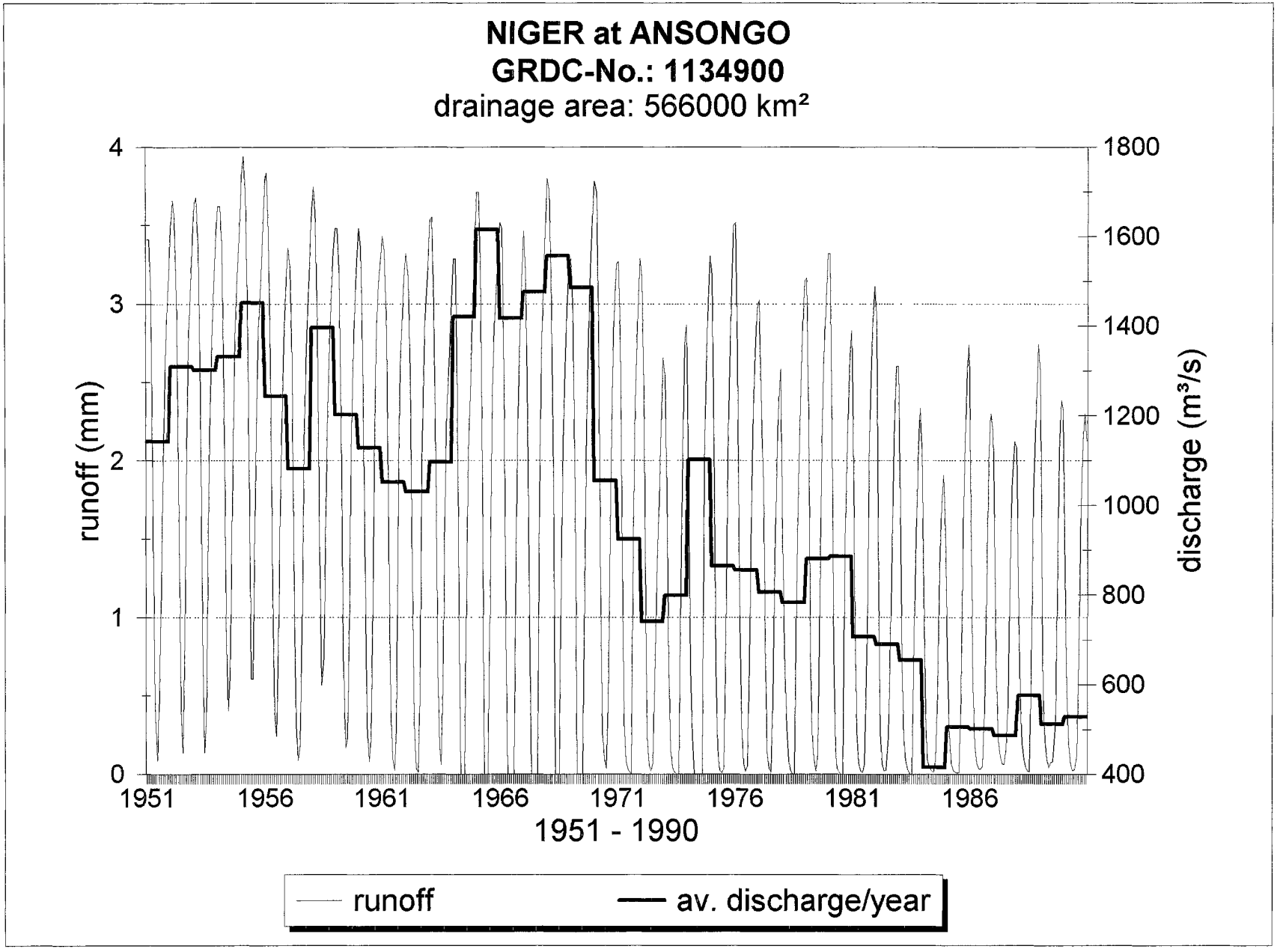

NIGER at MALANVILLE
Subregion: NIGER
3000
2500
2000
1500
1000
500
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1952 - 1980
maximum
minimum
mean

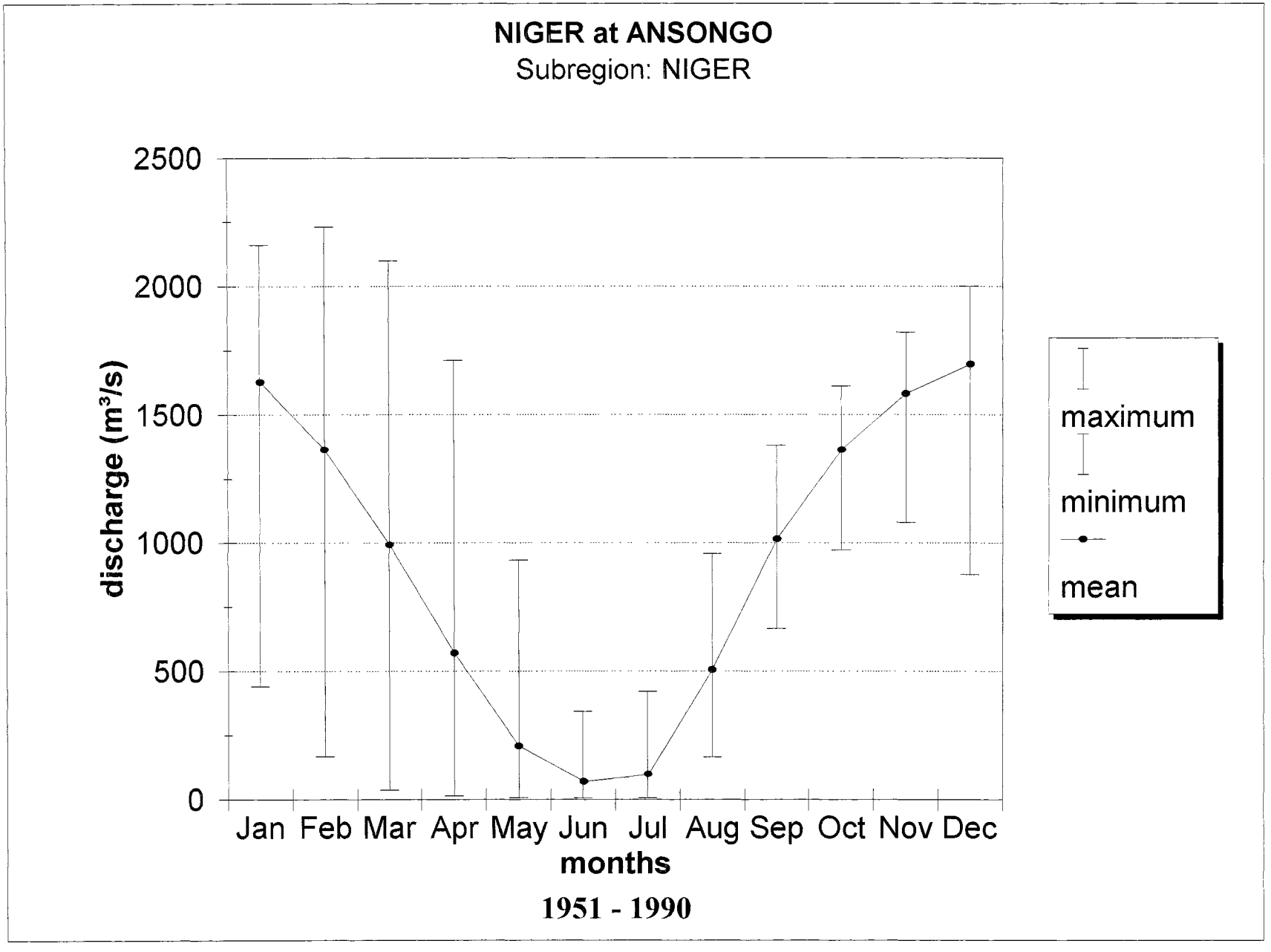

NIGER at GAYA
GRDC-No.: 1234250
drainage area: 1000000 km²
runoff (mm)
discharge (m³/s)
3
2.5
2
1.5
1
0.5
0
2000
1500
1000
500
0
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1952 - 1990
runoff
av. discharge/year

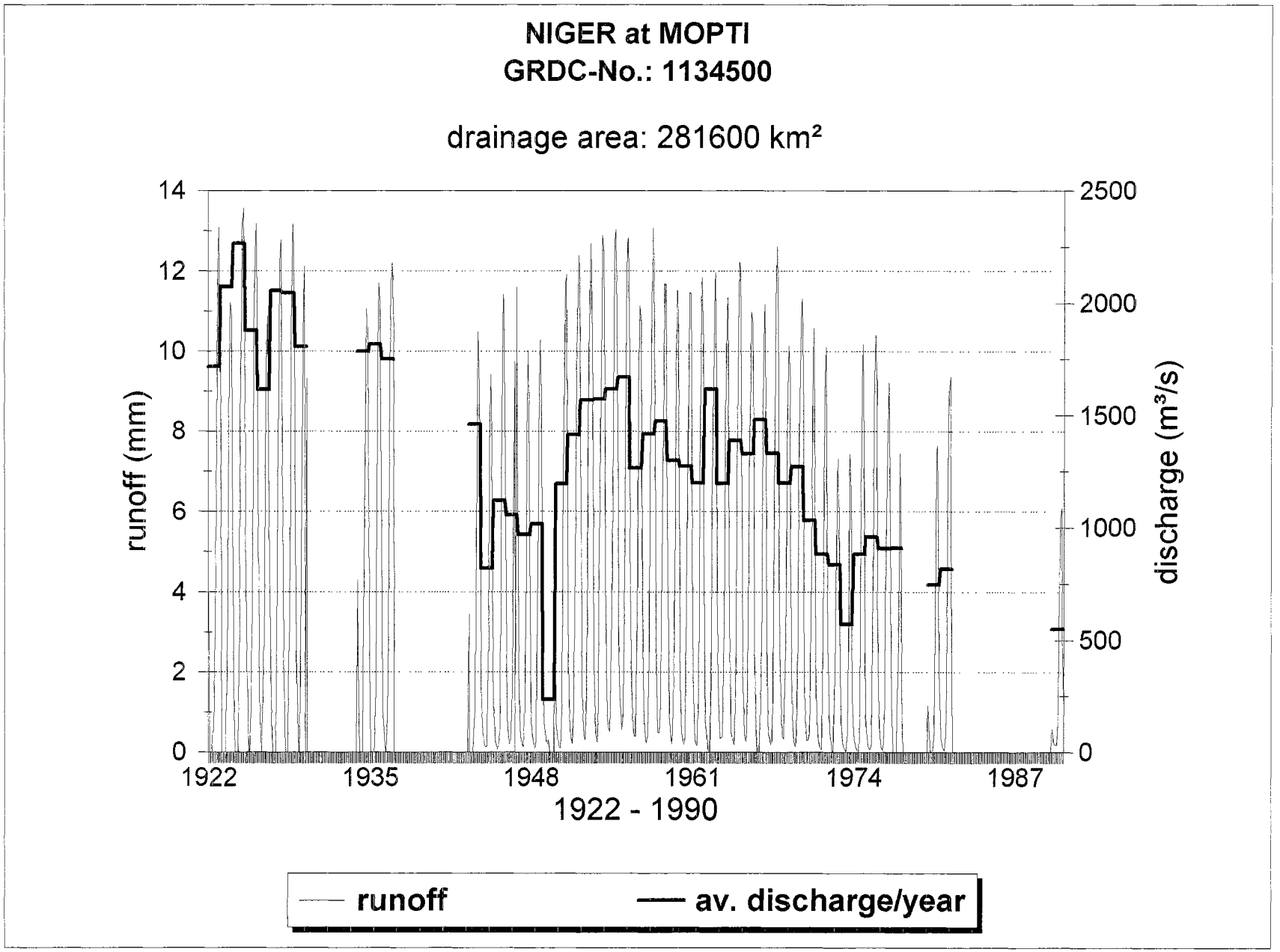

NIGER at GAYA
Subregion: NIGER
discharge (m³/s)
3000
2500
2000
1500
1000
500
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1952 - 1990
maximum
minimum
mean

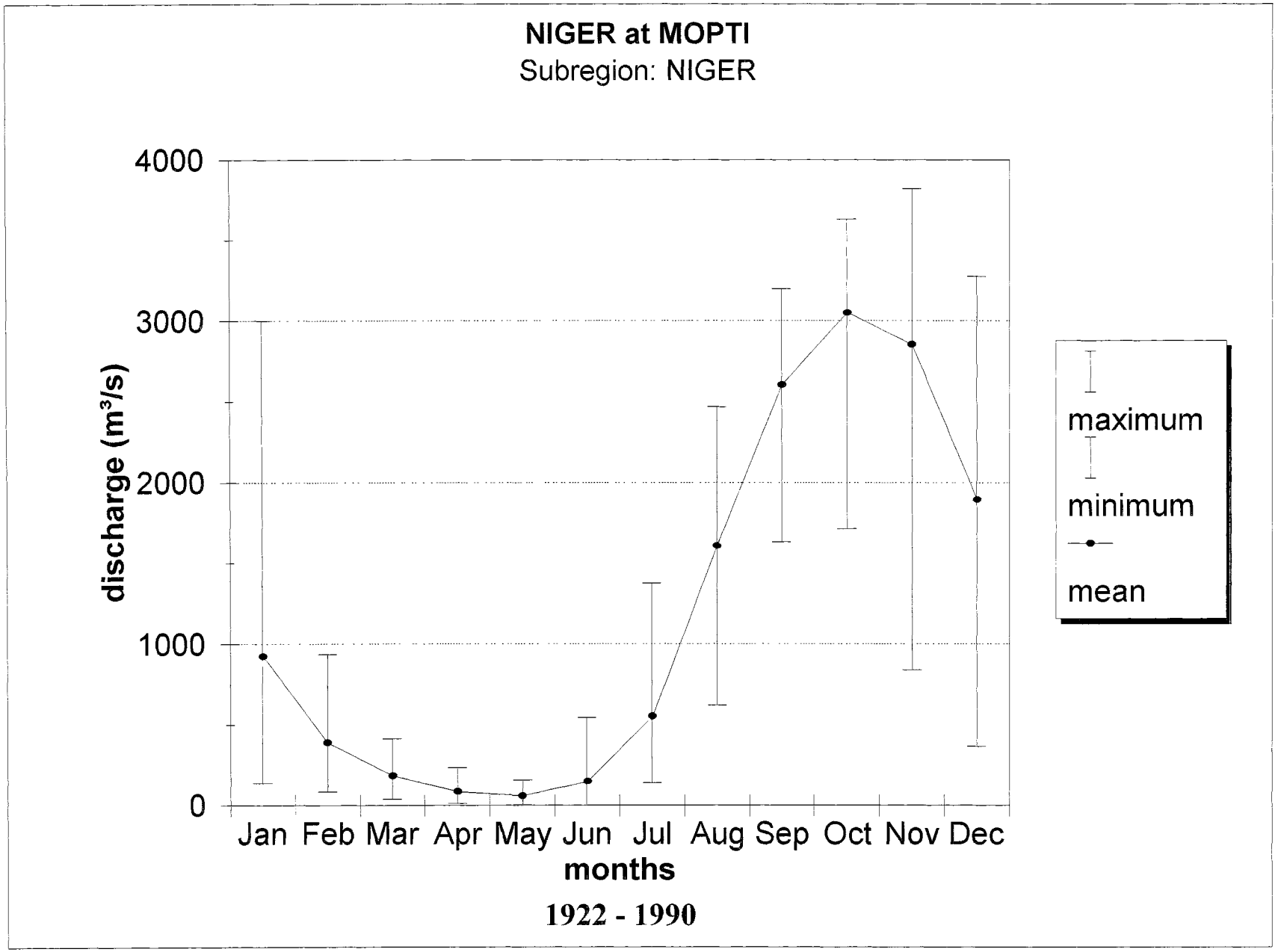

NIGER at NIAMEY
GRDC-No.: 1234150
drainage area: 700000 km²
runoff (mm)
discharge (m³/s)
3.5
3
2.5
2
1.5
1
0.5
0
1400
1200
1000
800
600
400
200
1929 1934 1939 1944 1949 1954 1959 1964 1969 1974 1979 1984 1989
1929 - 1990
runoff
av. discharge/year

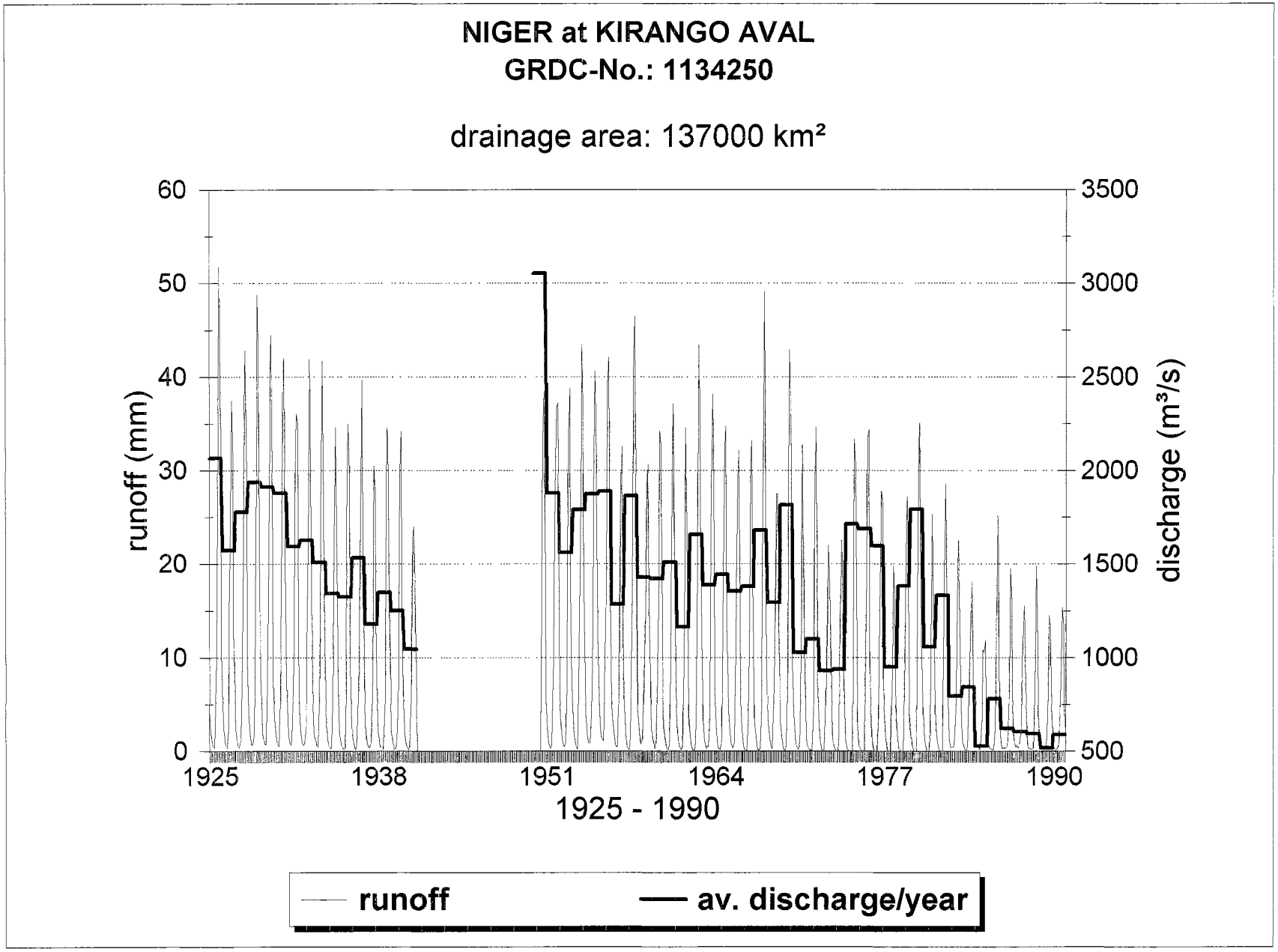

NIGER at NIAMEY
Subregion: NIGER
2500
2000
1500
1000
500
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1929 - 1991
maximum
minimum
mean

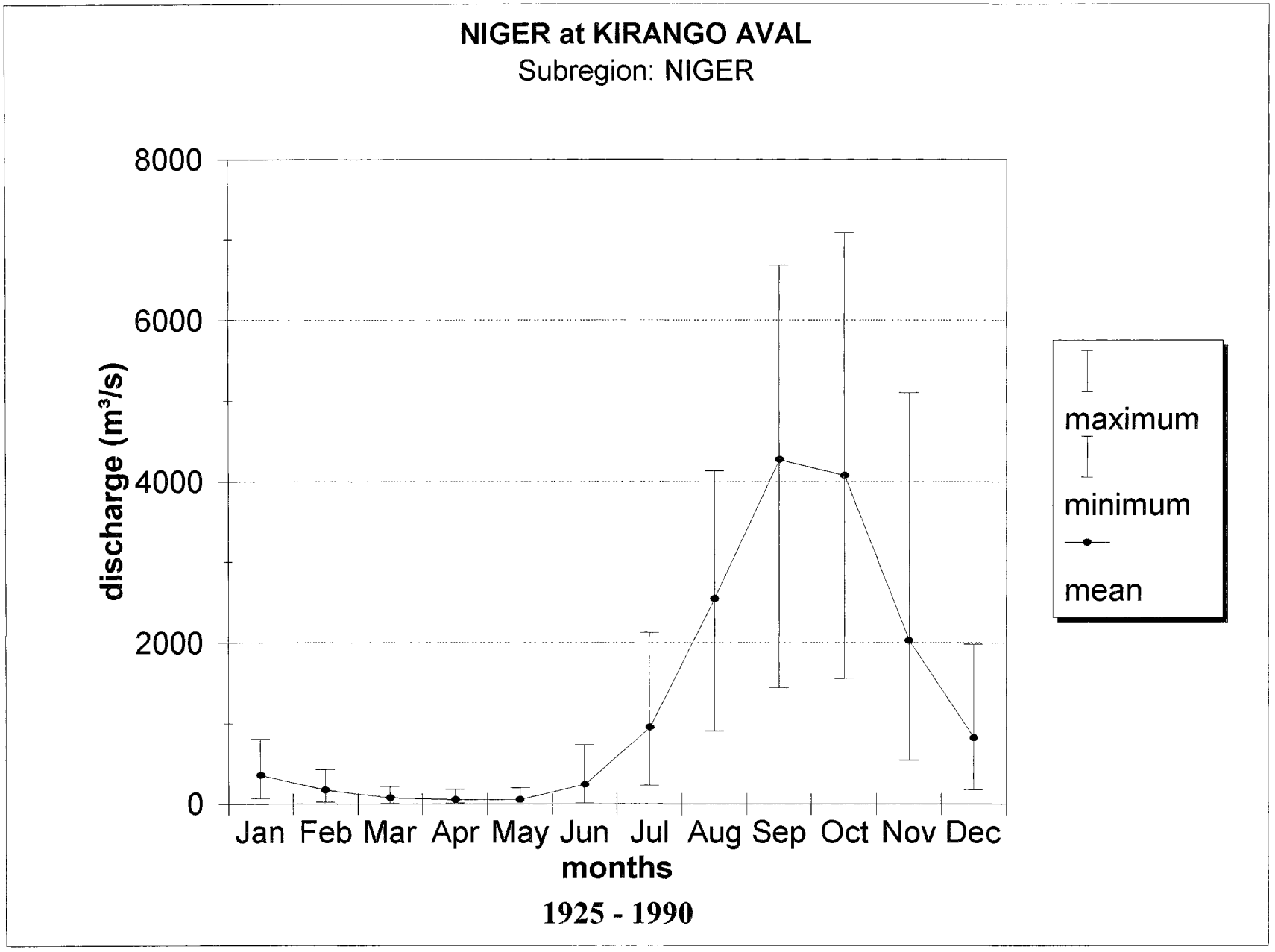

NIGER at ANSONGO
GRDC-No.: 1134900
drainage area: 566000 km²
runoff (mm)
discharge (m³/s)
0
1
2
3
4
400
600
800
1000
1200
1400
1600
1800
1951
1956
1961
1966
1971
1976
1981
1986
1951 - 1990
runoff
av. discharge/year

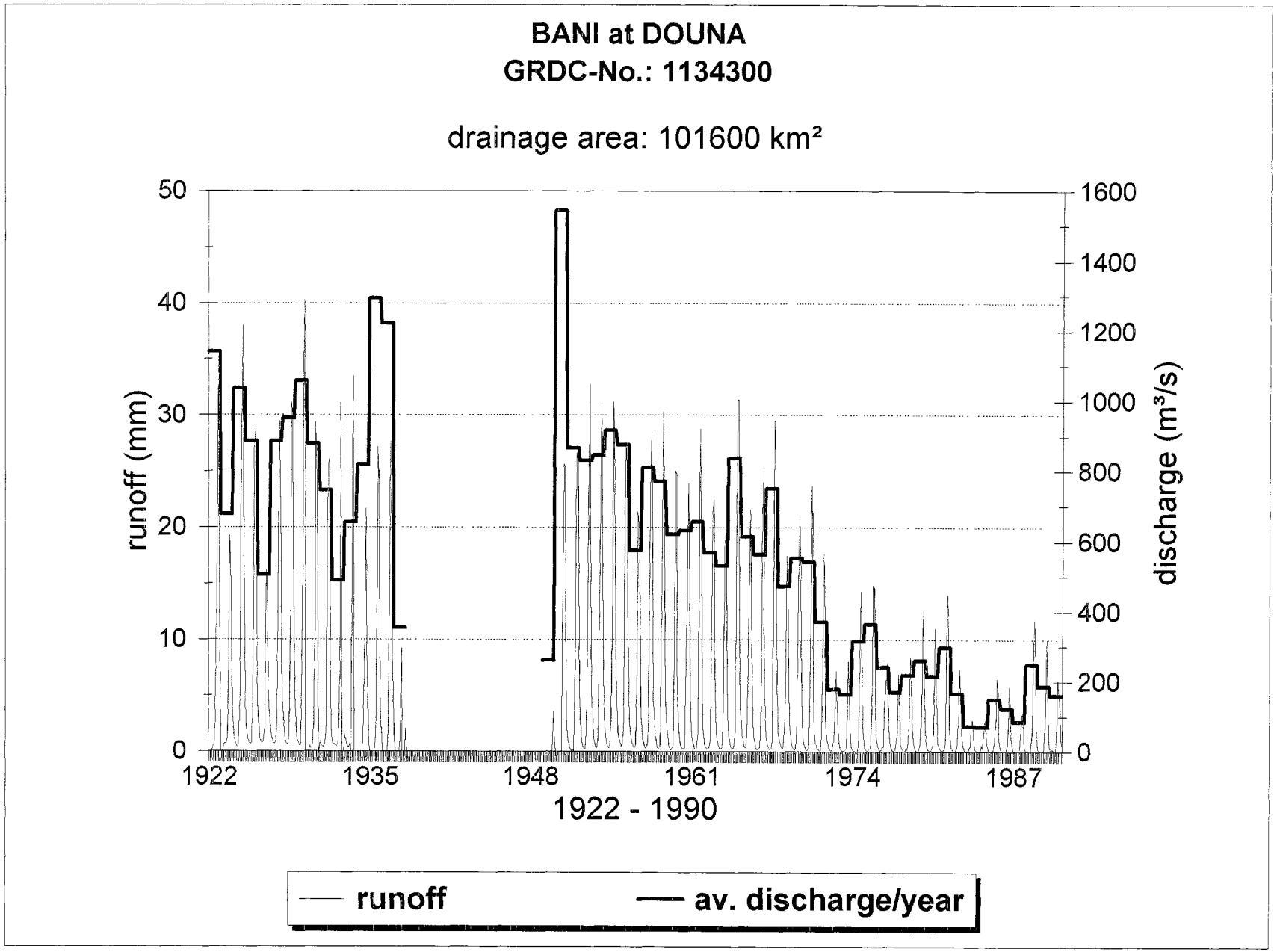

NIGER at ANSONGO
Subregion: NIGER
2500
2000
1500
1000
500
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1951 - 1990
maximum
minimum
mean

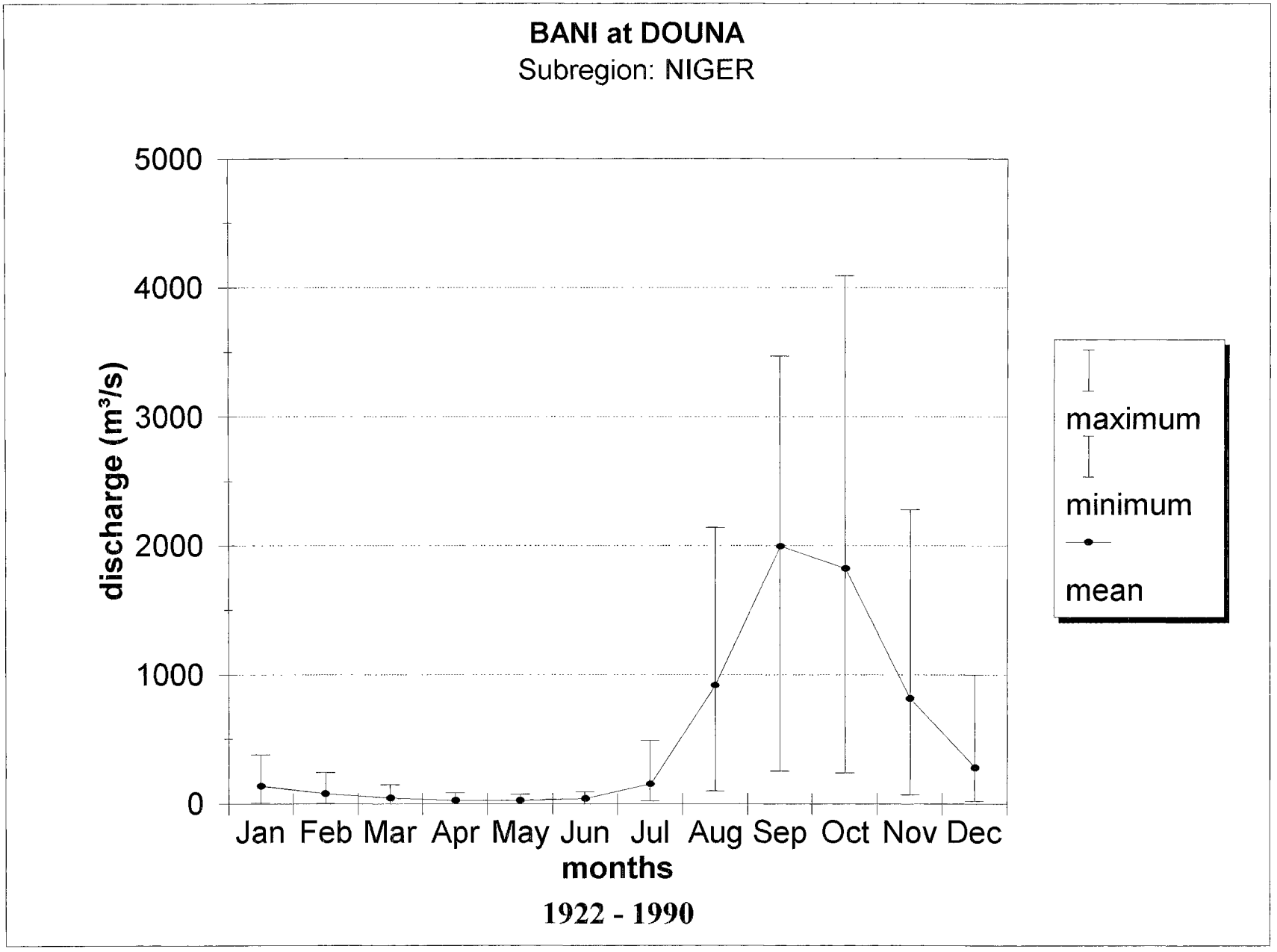

NIGER at MOPTI
GRDC-No.: 1134500
drainage area: 281600 km²
runoff (mm)
discharge (m³/s)
0
2
4
6
8
10
12
14
0
500
1000
1500
2000
2500
1922
1935
1948
1961
1974
1987
1922 - 1990
runoff
av. discharge/year

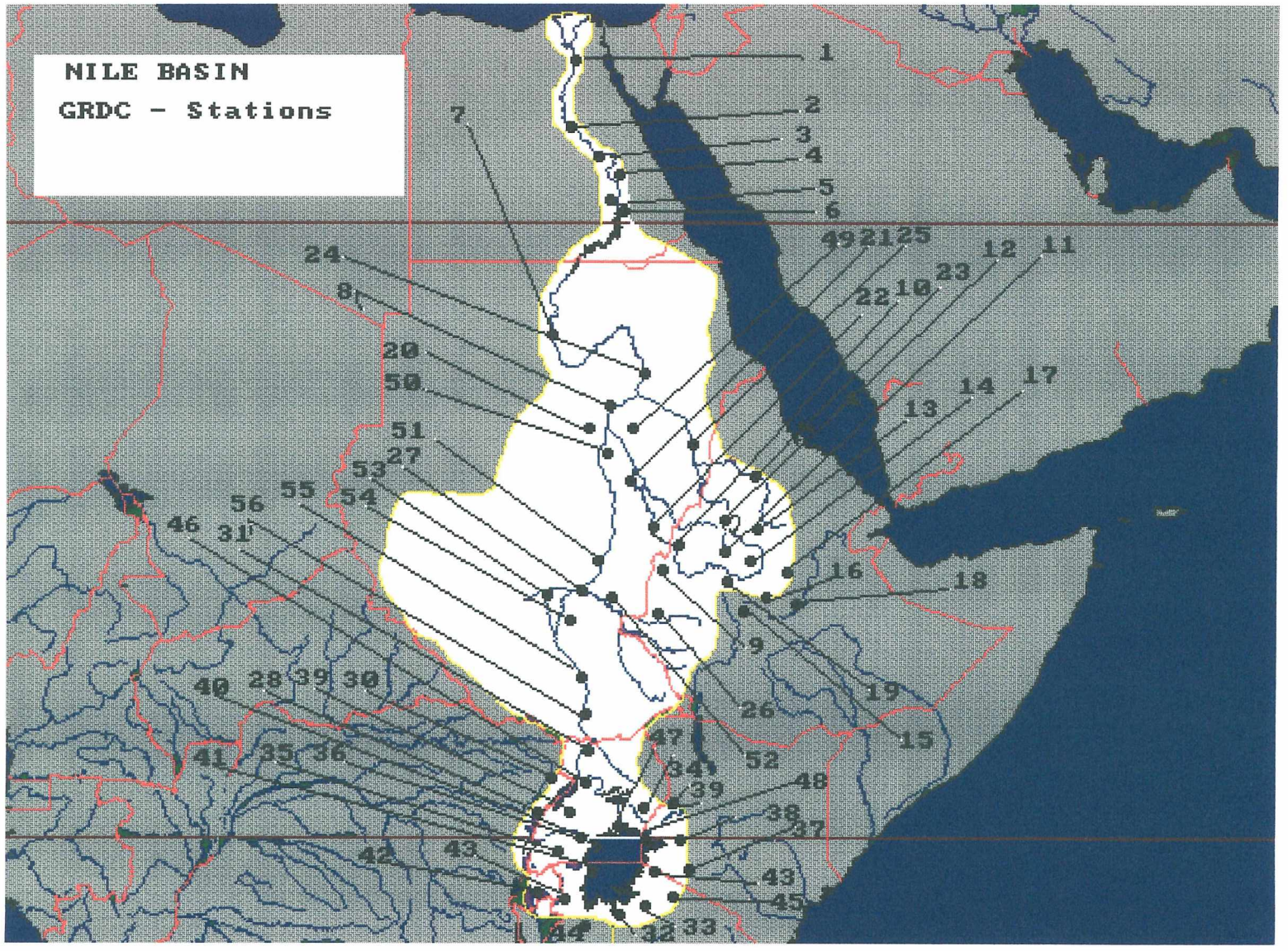

NIGER at MOPTI
Subregion: NIGER
4000
3000
2000
1000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1922 - 1990
maximum
minimum
mean


NIGER at KIRANGO AVAL
GRDC-No.: 1134250
drainage area: 137000 km²
runoff (mm)
discharge (m³/s)
60
50
40
30
20
10
0
3500
3000
2500
2000
1500
1000
500
1925
1938
1951
1964
1977
1990
1925 - 1990
runoff
av. discharge/year


NIGER at KIRANGO AVAL
Subregion: NIGER
8000
6000
4000
2000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
maximum
minimum
mean
1925 - 1990


BANI at DOUNA
GRDC-No.: 1134300
drainage area: 101600 km²
runoff (mm)
discharge (m³/s)
0
10
20
30
40
50
0
200
400
600
800
1000
1200
1400
1600
1922
1935
1948
1961
1974
1987
1922 - 1990
runoff
av. discharge/year


BANI at DOUNA
Subregion: NIGER
5000
4000
3000
2000
1000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1922 - 1990
maximum
minimum
mean

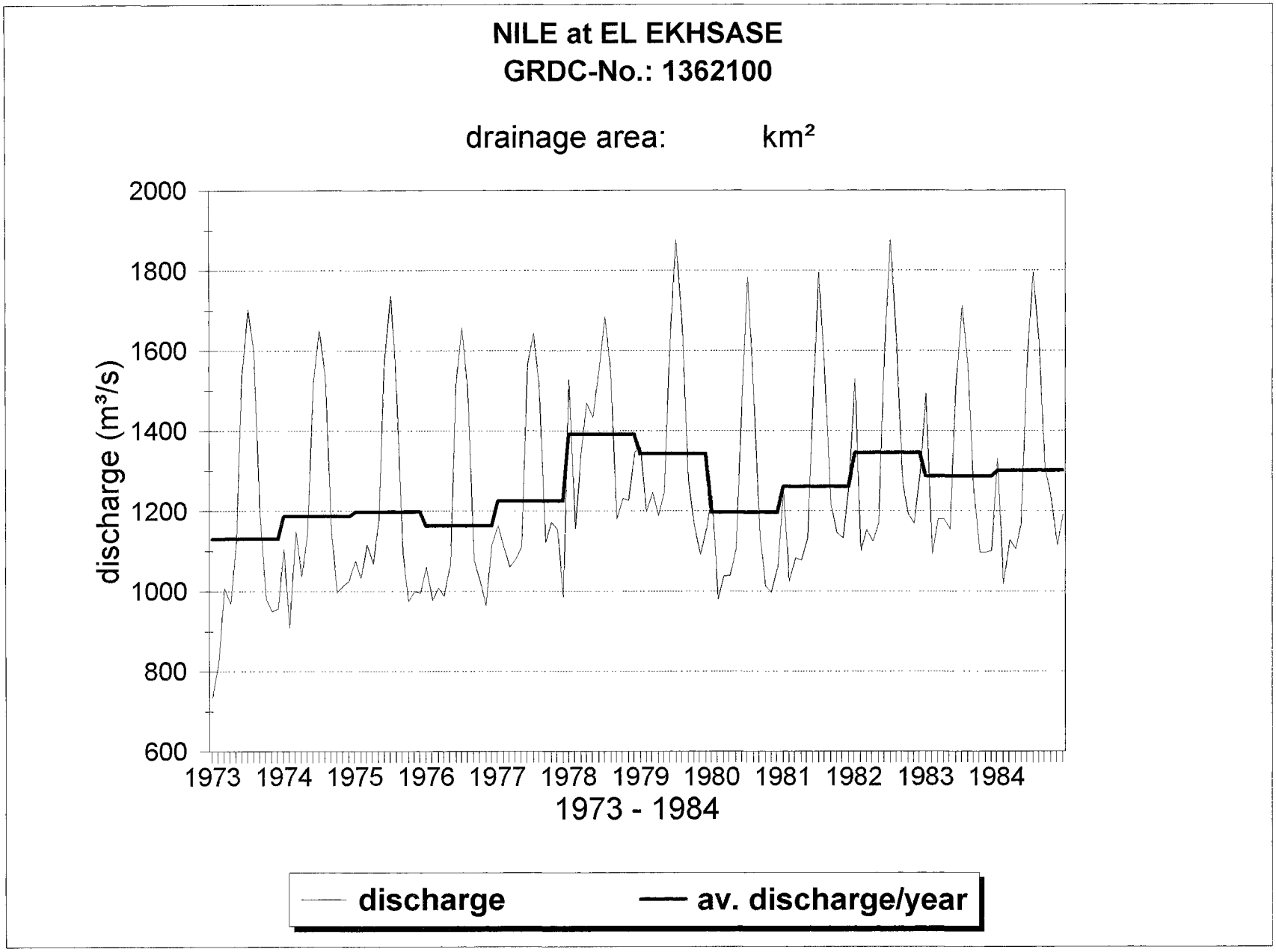

NILE BASIN
GRDC - Stations
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
30
31
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56

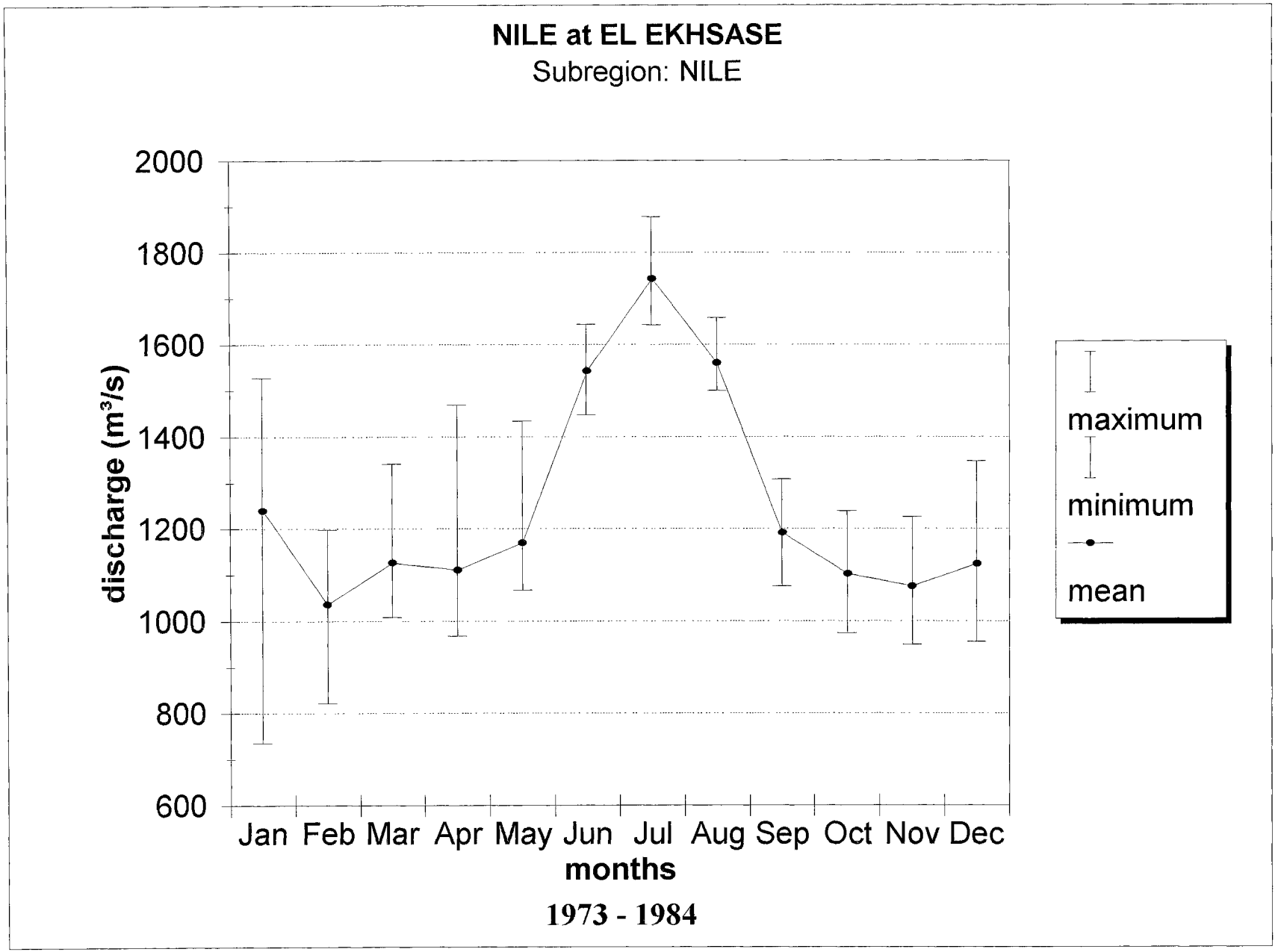
GLOBAL RUNOFF DATA CENTRE (GRDC)
20 LARGEST RIVERS

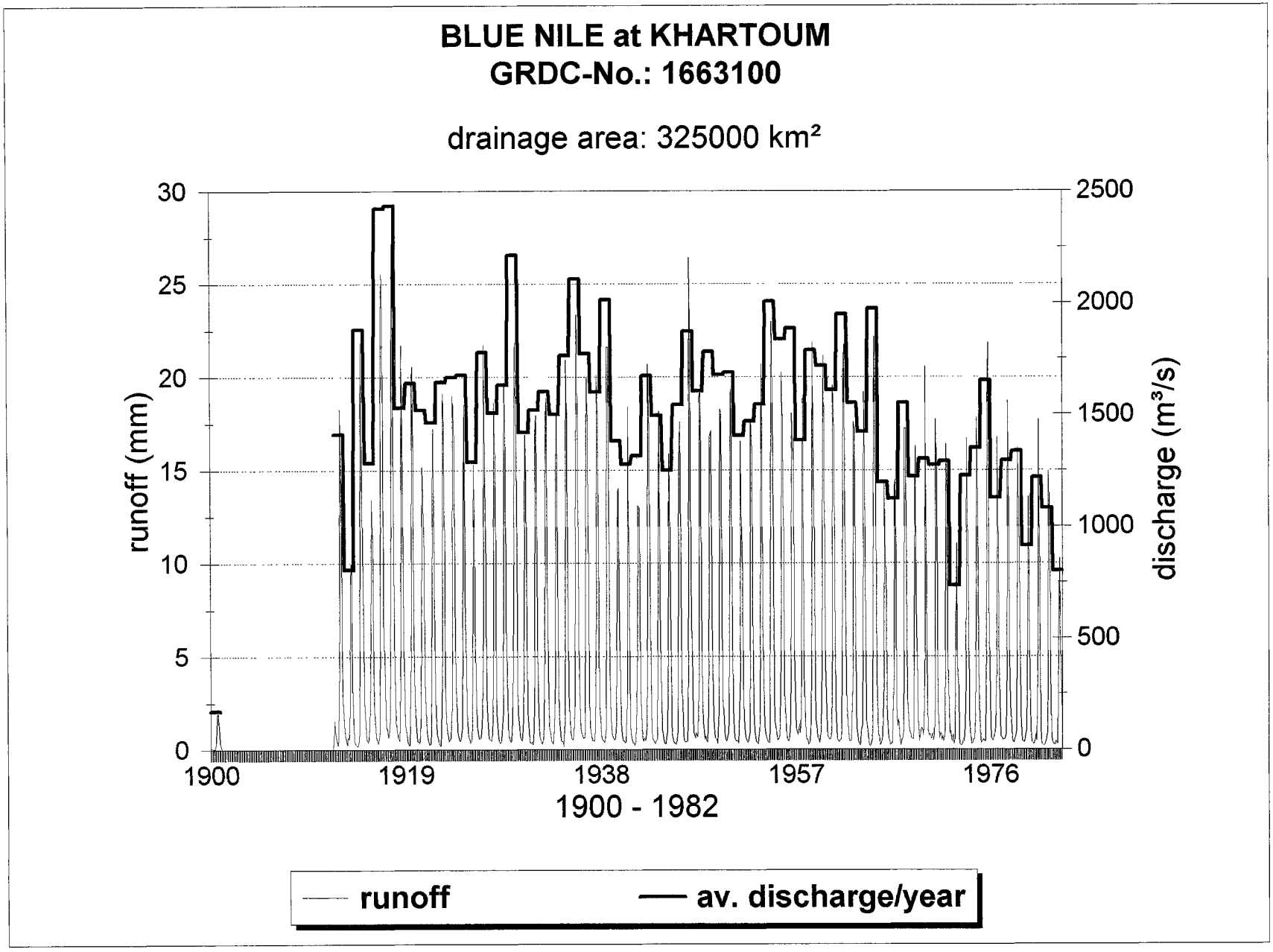
	NILE							table 1
No.	River	Station	Area (km²)	Latitude	Longitude	first rec.	last rec.	day/month
1	**Nile**	**el Ekhsase**		**2970N**	**3128E**	**1 1973**	**12 1984**	M
2	Nile	Assiut		2718N	3110E	1 1973	12 1984	M
3	Nile	Nag Hammadi		2605N	3225E	1 1973	12 1984	M
4	Nile	Esna		2532N	3256E	1 1973	12 1984	M
5	Nile	Gaafra		2432N	3290E	1 1973	12 1984	M
6	Nile	Aswan Dam		2396N	3290E	7 1869	12 1984	M
7	Nile	Dongola		1918N	3048E	1 1912	12 1984	M
	Nile	Hudeiba				1 1912	12 1982	M
8	Nile	Tamaniat		1595N	3263E	1 1912	12 1982	M
9	Hoha	near Asosa	161	1015N	3463E	1 1978	12 1980	D
10	Blue Nile	Sudan Border		1100N	3500E	1 1969	9 1975	M
11	Fettam	Tilili	282	1085N	3702E	1 1978	12 1980	D
12	Gilgel Abbay	near Merawi	1664	1137N	3703E	1 1978	12 1980	D
13	Neshi	near Shamboo	322	975N	3725E	1 1978	12 1980	D
14	Gudla	near Dembcha	242	1055N	3750E	1 1978	12 1980	D
15	Fatto	near Guder	96	887N	3772E	1 1978	12 1980	D
16	Guder	Guder	524	895N	3775E	1 1978	12 1980	D
17	Blue Nile	near The Lake Tana		1000N	3700E	1 1969	12 1975	M
18	Blue Nile(Abbay River)	Kessie	65784	1107N	3818E	1 1976	12 1979	M
19	Beressa	Debre Berhan	211	967N	3952E	1 1978	12 1980	D
20	Blue Nile	Khartoum	325000	1562N	3255E	1 1912	12 1982	M
21	Blue Nile	Sennar		1355N	3347E	1 1912	12 1982	M
22	Blue Nile	Roseires Dam	210000	1185N	3438E	1 1912	12 1982	M
23	Tekeze	Embamadre	45694	1373N	3820E	1 1976	12 1976	M
24	Atbara	Kilo 3	69000	1770N	3397E	1 1912	12 1982	M
25	Khashm el Girba Canal	Khashm el Girba Canal		1497N	3592E	7 1974	11 1982	M
	Atbara	Dowmstream Khashm el Girba Dam		1497N	3592E	1 1973	12 1981	M
26	Baro	Gambella	23461	825N	3458E	1 1976	12 1979	M
27	Sobat	Hillet Doleib		937N	3163E	1 1973	12 1982	M
28	Semliki	Bweramule	8000	093N	3000E	1 1948	12 1970	M
29	Muzizi	Hoima-Fort Portal Road	2603	087N	3073E	1 1976	12 1979	M

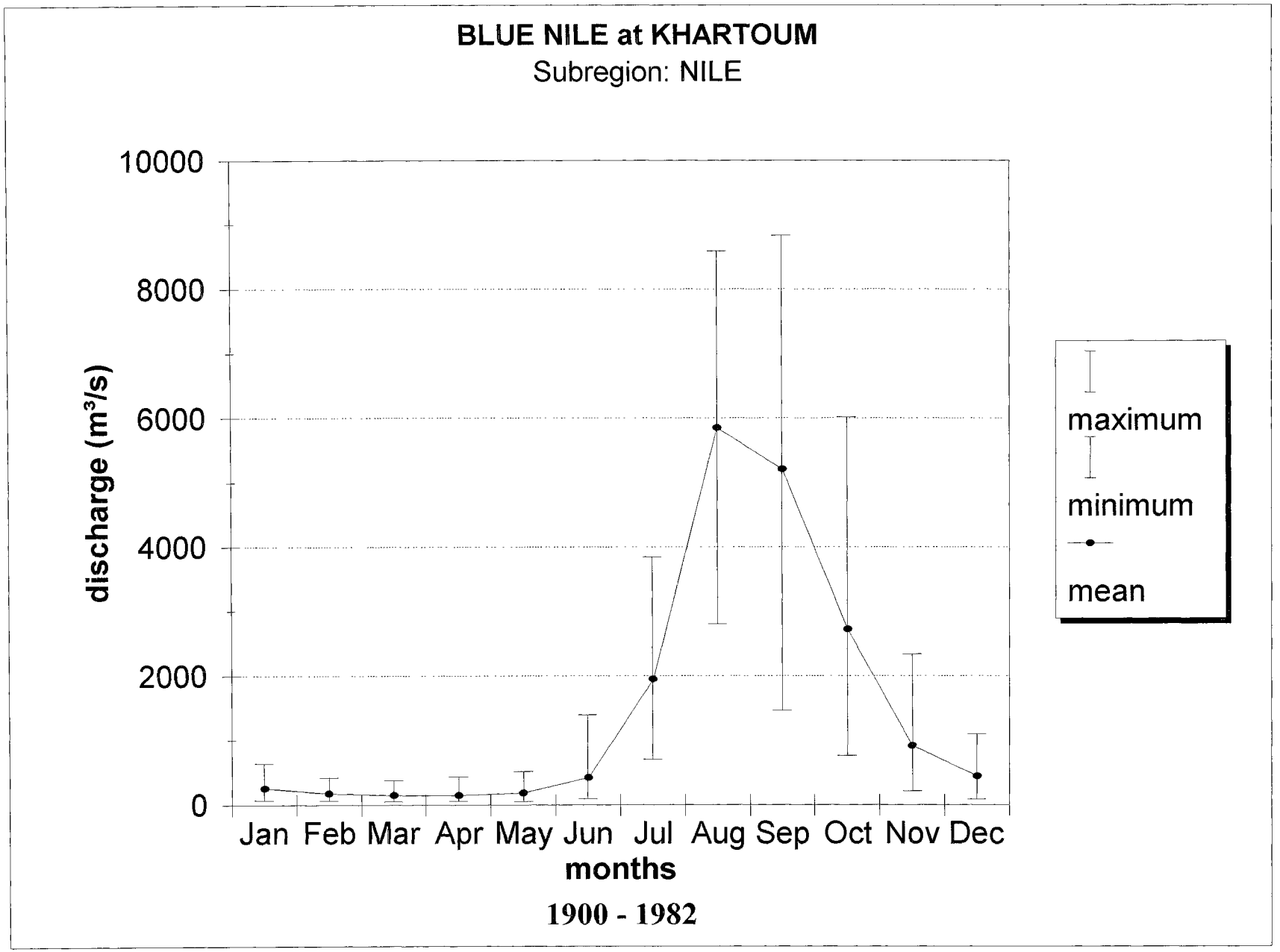
GLOBAL RUNOFF DATA CENTRE (GRDC)
20 LARGEST RIVERS

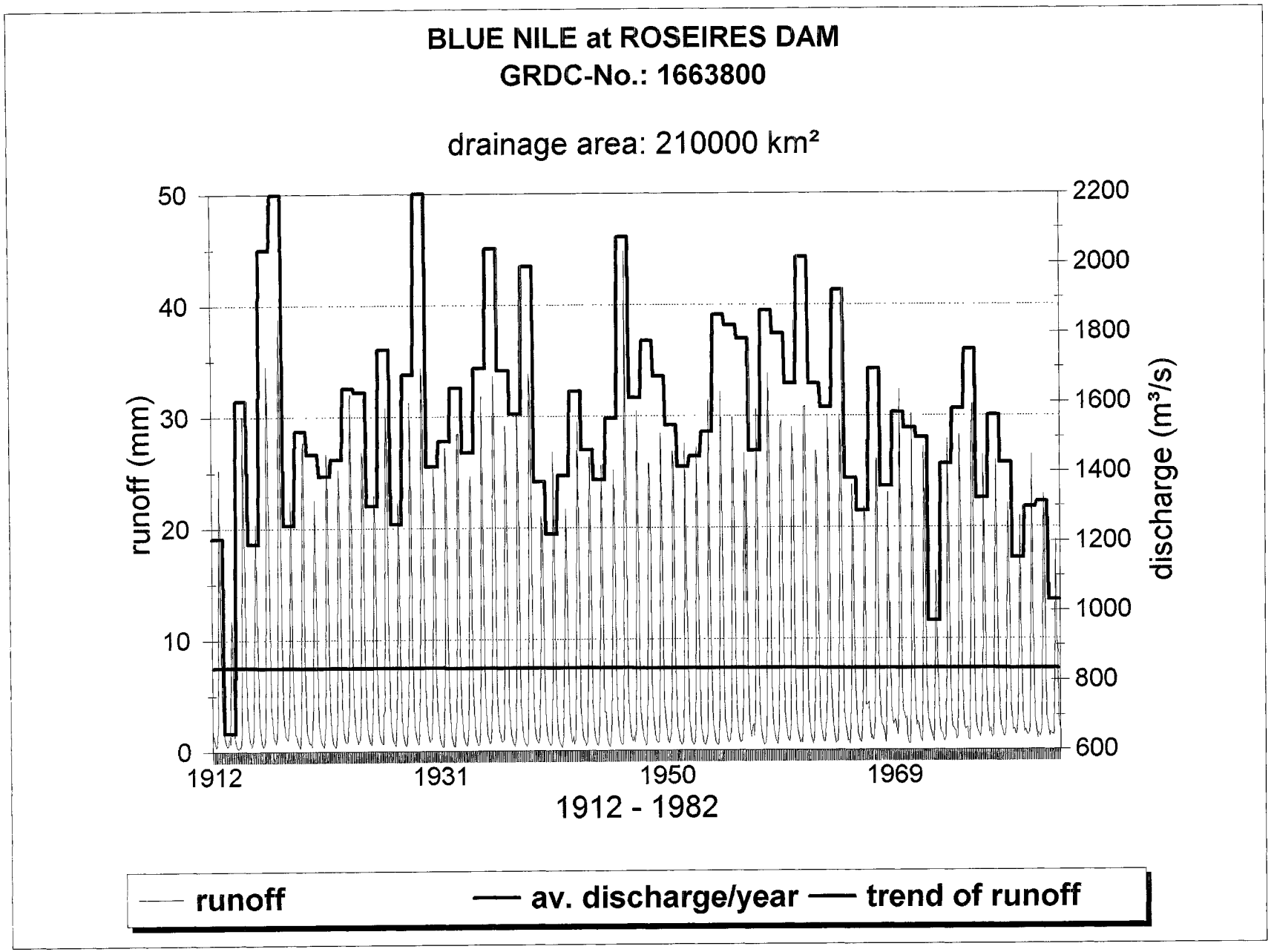
	NILE							table 2
No.	River	Station	Area (km²)	Latitude	Longitude	first rec.	last rec.	day/month
30	Nkussi	Hoima-Fort Portal Road	1815	113N	3100E	1 1976	12 1979	M
31	Lake Albert	Outlet		242N	3145E	1 1973	12 1981	M
32	Magogo	Mwanza Shinyanga Road Bridge	1200	292S	3315E	1 1978	12 1979	D
32	Magogo	Mwanza Shinyanga Road Bridge	1200	292S	3315E	1 1970	12 1979	M
33	Simiyu	Ndagalu	6093	264S	3354E	1 1971	12 1979	M
34	Grumet	Road Crossing	9210	206S	3394E	1 1970	12 1979	M
35	Rwizi	Mbarara Water Supply	1070	062S	3065E	1 1976	12 1978	M
36	Awach Kaboun	Oyugis-Kindu	540	037S	3463E	1 1978	12 1980	D
37	Nyando	Ahero Bridge	2625	028S	3500E	1 1978	12 1980	D
38	Anomotua	Twin Bridge	606	018S	3517E	1 1978	12 1980	D
39	Nyando	Muhoroni	1419	016S	3516E	2 1978	12 1980	D
40	Kagera	Kyaka Ferry		127S	3142E	1 1940	12 1971	M
41	Upper Ngono	Kyaka Road Bridge	1161	147S	3167E	1 1978	12 1979	D
42	Nyabarongo	Kigali	8900	200S	3000E	1 1965	12 1984	M
43	Nyabarongo	Kanzenze	14600	206S	3011E	1 1965	12 1984	M
44	Kagera	Rusumo	30200	238S	3079E	2 1965	12 1984	M
45	Mara	Mara Mines	1500	165S	3456E	1 1970	12 1979	M
46	Victoria Nile	Paara	340000	228N	3157E	1 1948	12 1970	M
	Victoria Nile	Mbulamuti		082N	3303E	1 1973	12 1979	M
47	Victoria Nile	Owen Reservoir	269000	047N	3312E	1 1973	12 1982	M
	Victoria Nile	Jinja		043N	3320E	1 1946	12 1970	M
48	Manafwa	Bulucheke/butaleja	65	100N	3435E	1 1976	12 1979	M
	Albert Nile	Panyango				1 1948	12 1970	M
49	White Nile	Mogren		1560N	3255E	1 1973	12 1982	M
50	White Nile	Downstream of Jebel Aulia Dam		1523N	3250E	1 1973	12 1982	M
51	White Nile	Melut		1043N	3220E	1 1973	12 1982	M
52	White Nile	Malakal	1080000	958N	3162E	1 1912	12 1982	M
53	White Nile	Abu Tong		946N	3112E	1 1973	5 1982	M
54	Bahr el Zeraf	Kilo 3		938N	3117E	1 1973	5 1982	M
55	Bahr el Jebel	Malek		607N	3160E	1 1973	12 1982	M
56	Bahr el Jebel	Mongalla	450000	520N	3177E	1 1912	12 1982	M

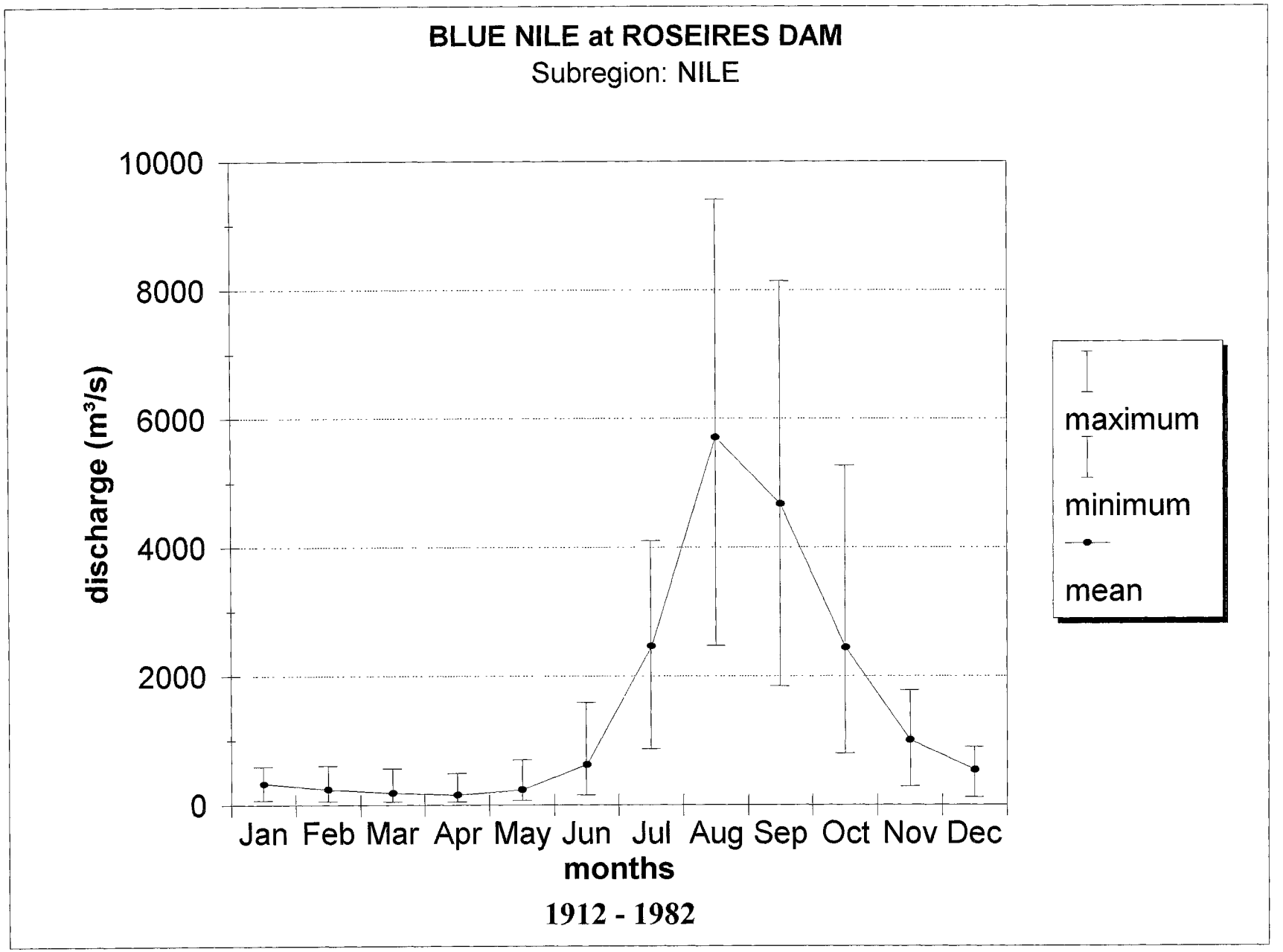

NILE at EL EKHSASE
GRDC-No.: 1362100
drainage area: km²
discharge (m³/s)
2000
1800
1600
1400
1200
1000
800
600
1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984
1973 - 1984
discharge
av. discharge/year

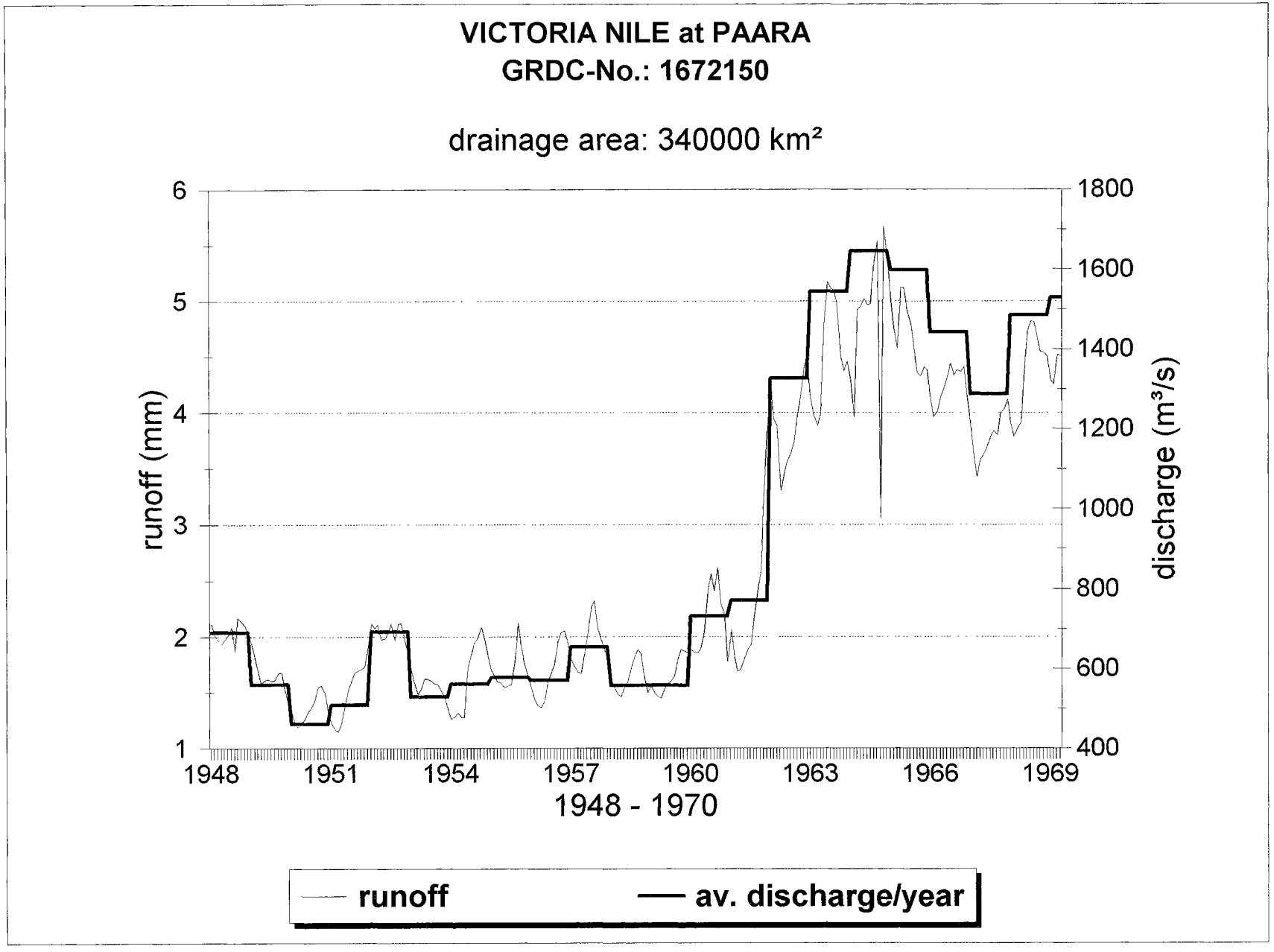

NILE at EL EKHSASE
Subregion: NILE
2000
1800
1600
1400
1200
1000
800
600
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1973 - 1984
maximum
minimum
mean

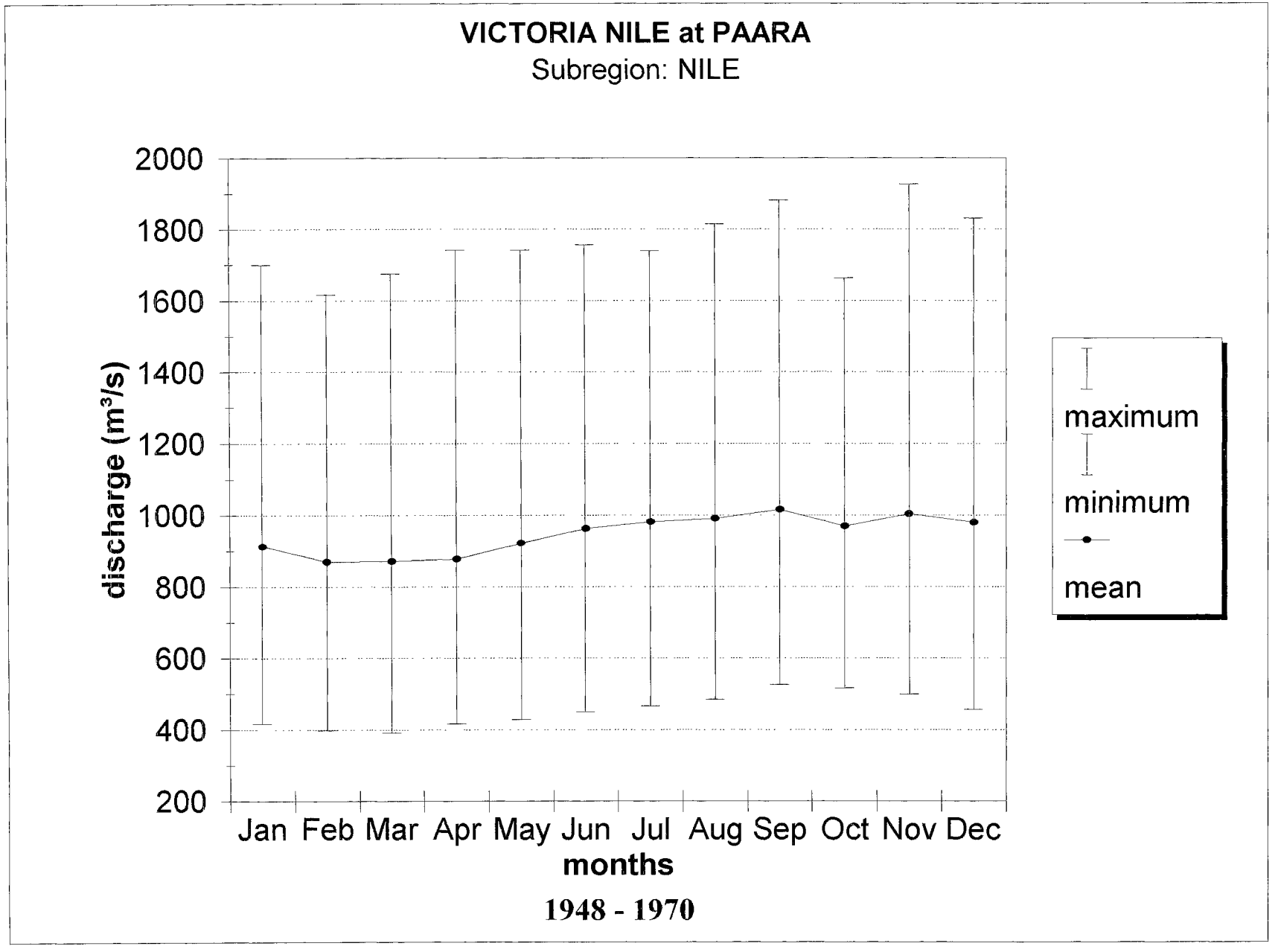

BLUE NILE at KHARTOUM
GRDC-No.: 1663100
drainage area: 325000 km²
runoff (mm)
discharge (m³/s)
30
25
20
15
10
5
0
2500
2000
1500
1000
500
0
1900
1919
1938
1957
1976
1900 - 1982
runoff
av. discharge/year

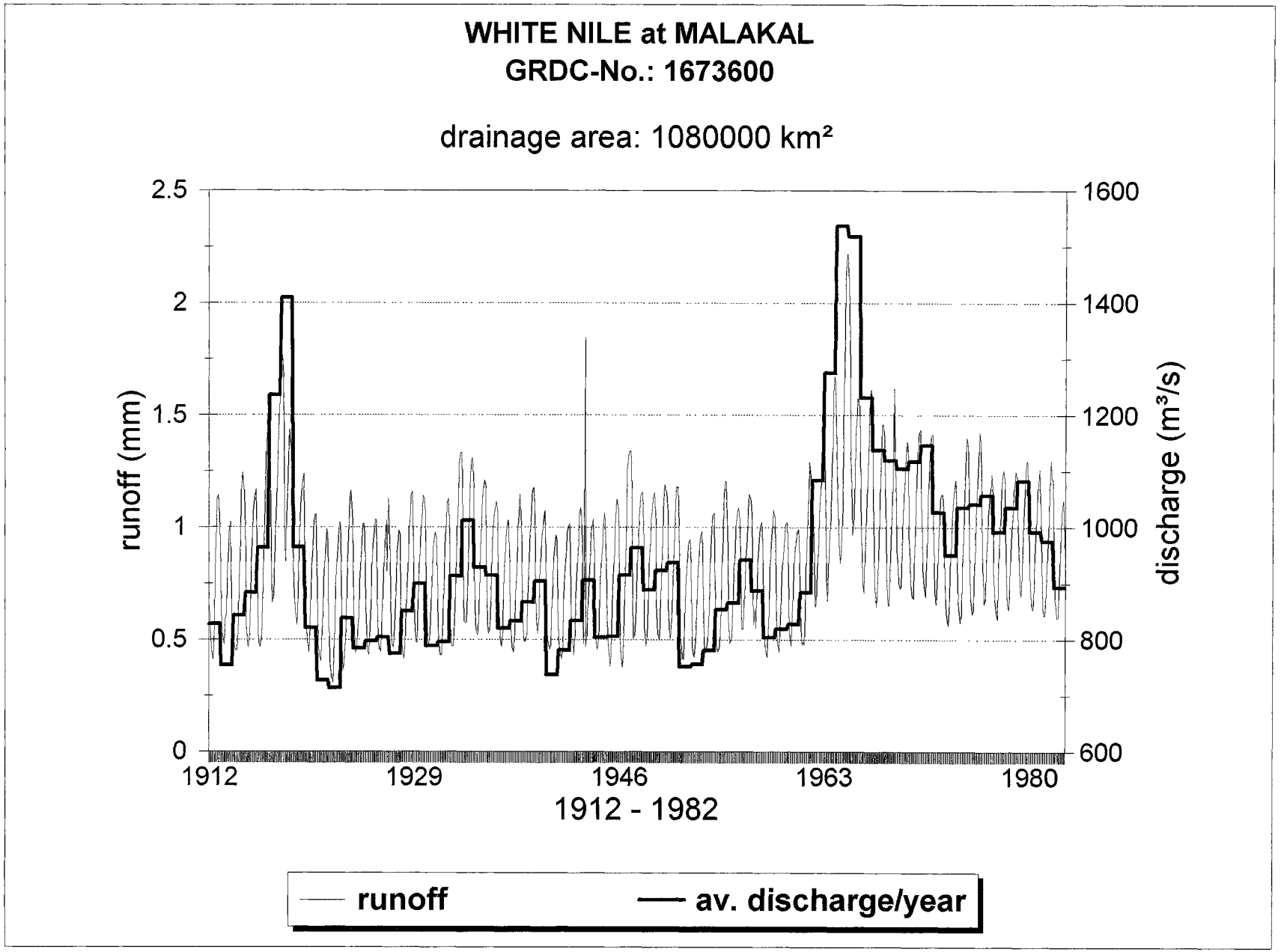

BLUE NILE at KHARTOUM
Subregion: NILE
10000
8000
6000
4000
2000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
maximum
minimum
mean
1900 - 1982

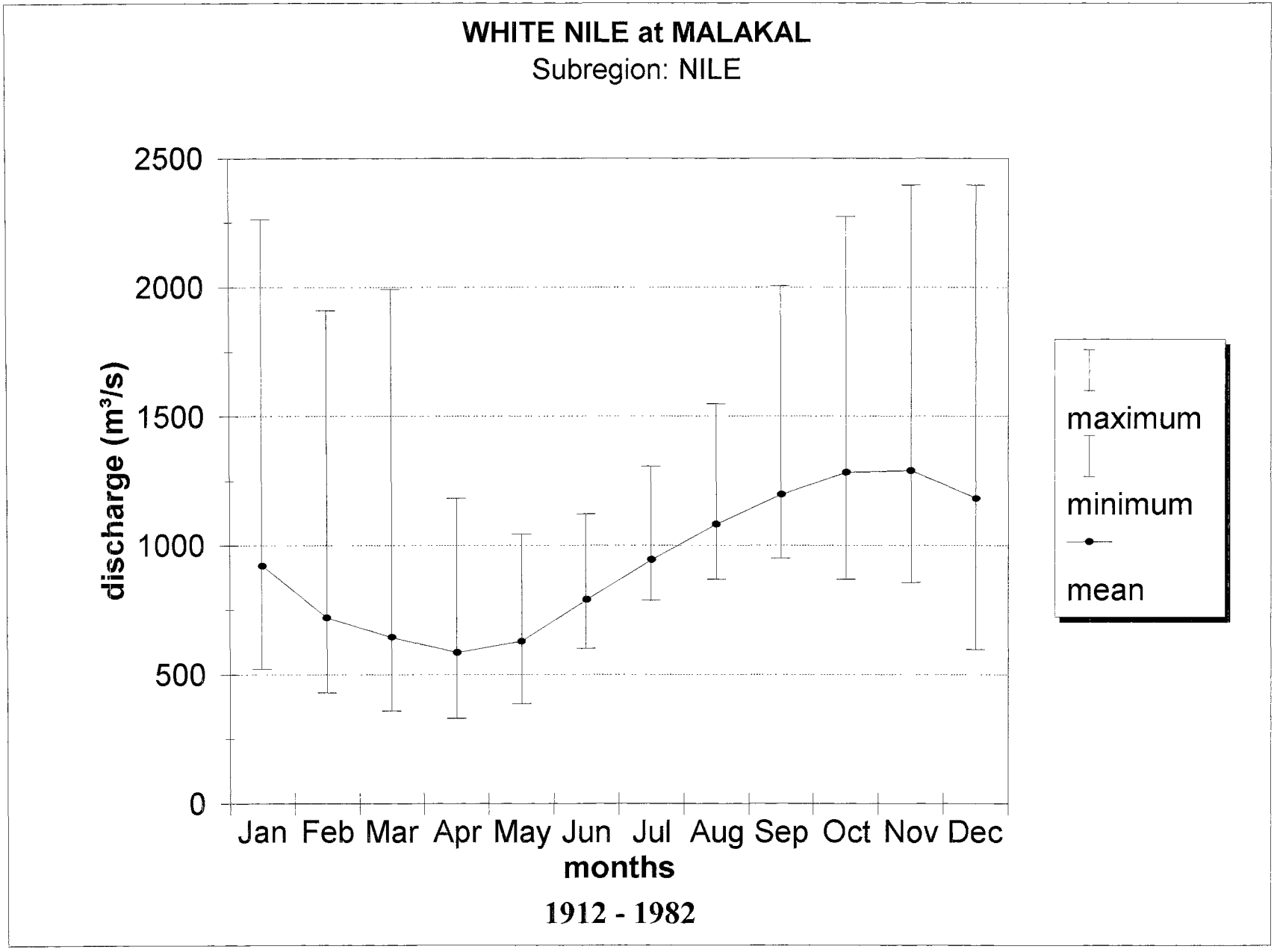

BLUE NILE at ROSEIRES DAM
GRDC-No.: 1663800
drainage area: 210000 km²
runoff (mm)
discharge (m³/s)
50
40
30
20
10
0
2200
2000
1800
1600
1400
1200
1000
800
600
1912
1931
1950
1969
1912 - 1982
runoff
av. discharge/year
trend of runoff

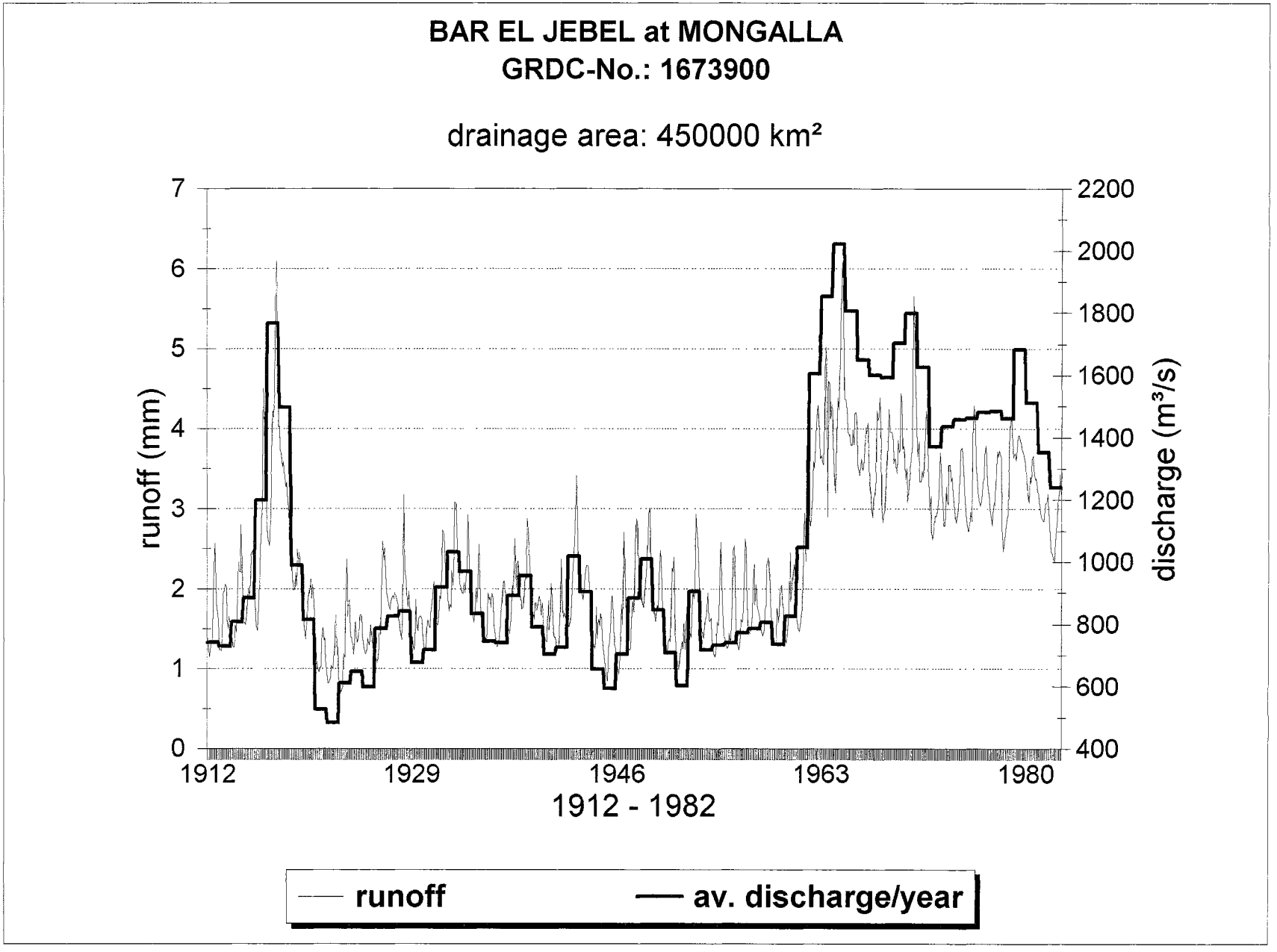

BLUE NILE at ROSEIRES DAM
Subregion: NILE
10000
8000
6000
4000
2000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
maximum
minimum
mean
1912 - 1982

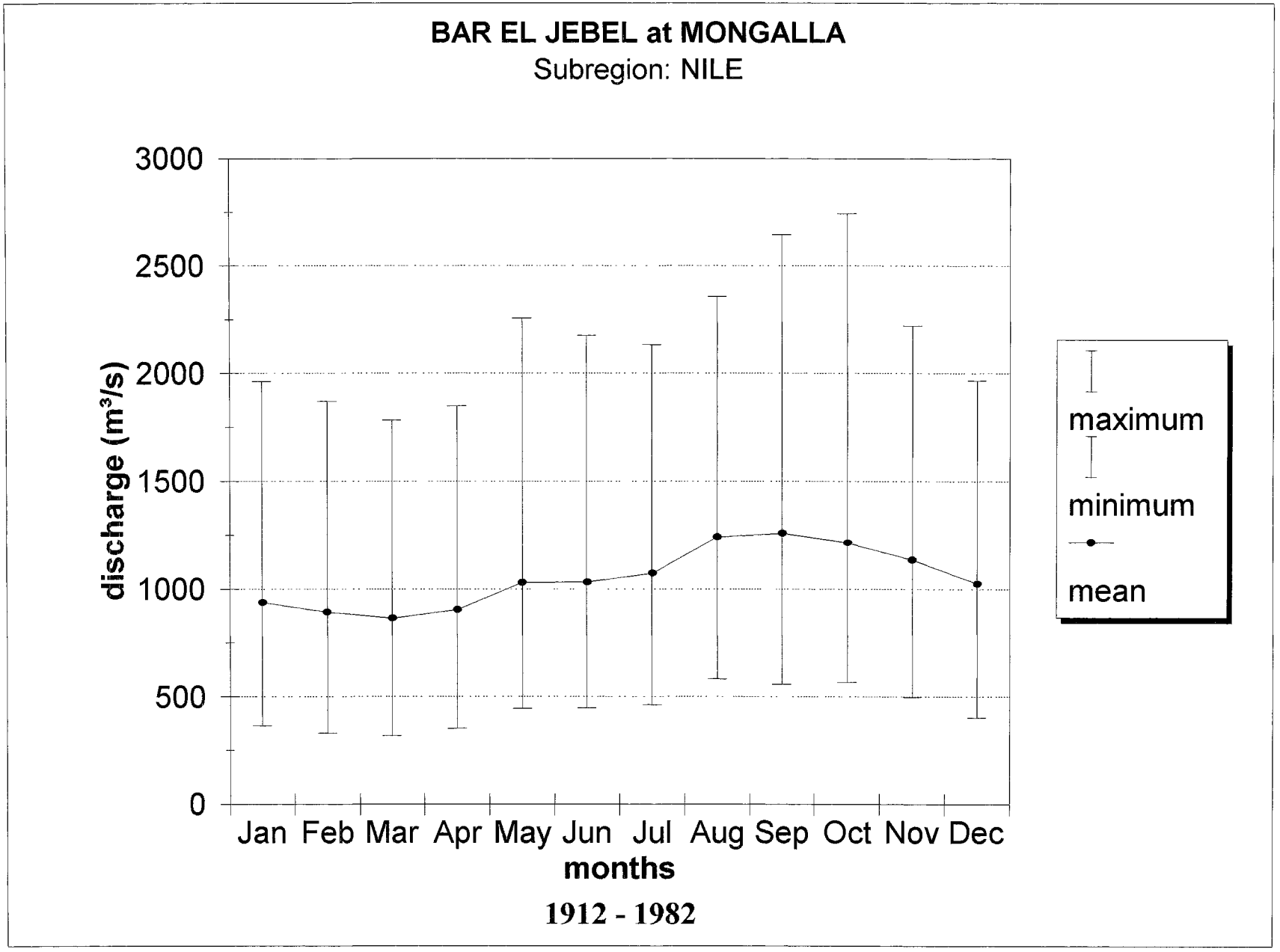

VICTORIA NILE at PAARA
GRDC-No.: 1672150
drainage area: 340000 km²
runoff (mm)
discharge (m³/s)
6
5
4
3
2
1
1800
1600
1400
1200
1000
800
600
400
1948
1951
1954
1957
1960
1963
1966
1969
1948 - 1970
runoff
av. discharge/year


VICTORIA NILE at PAARA
Subregion: NILE
2000
1800
1600
1400
1200
1000
800
600
400
200
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1948 - 1970
maximum
minimum
mean


WHITE NILE at MALAKAL
GRDC-No.: 1673600
drainage area: 1080000 km²
runoff (mm)
discharge (m³/s)
2.5
2
1.5
1
0.5
0
1600
1400
1200
1000
800
600
1912
1929
1946
1963
1980
1912 - 1982
runoff
av. discharge/year


WHITE NILE at MALAKAL
Subregion: NILE
2500
2000
1500
1000
500
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
maximum
minimum
mean
1912 - 1982

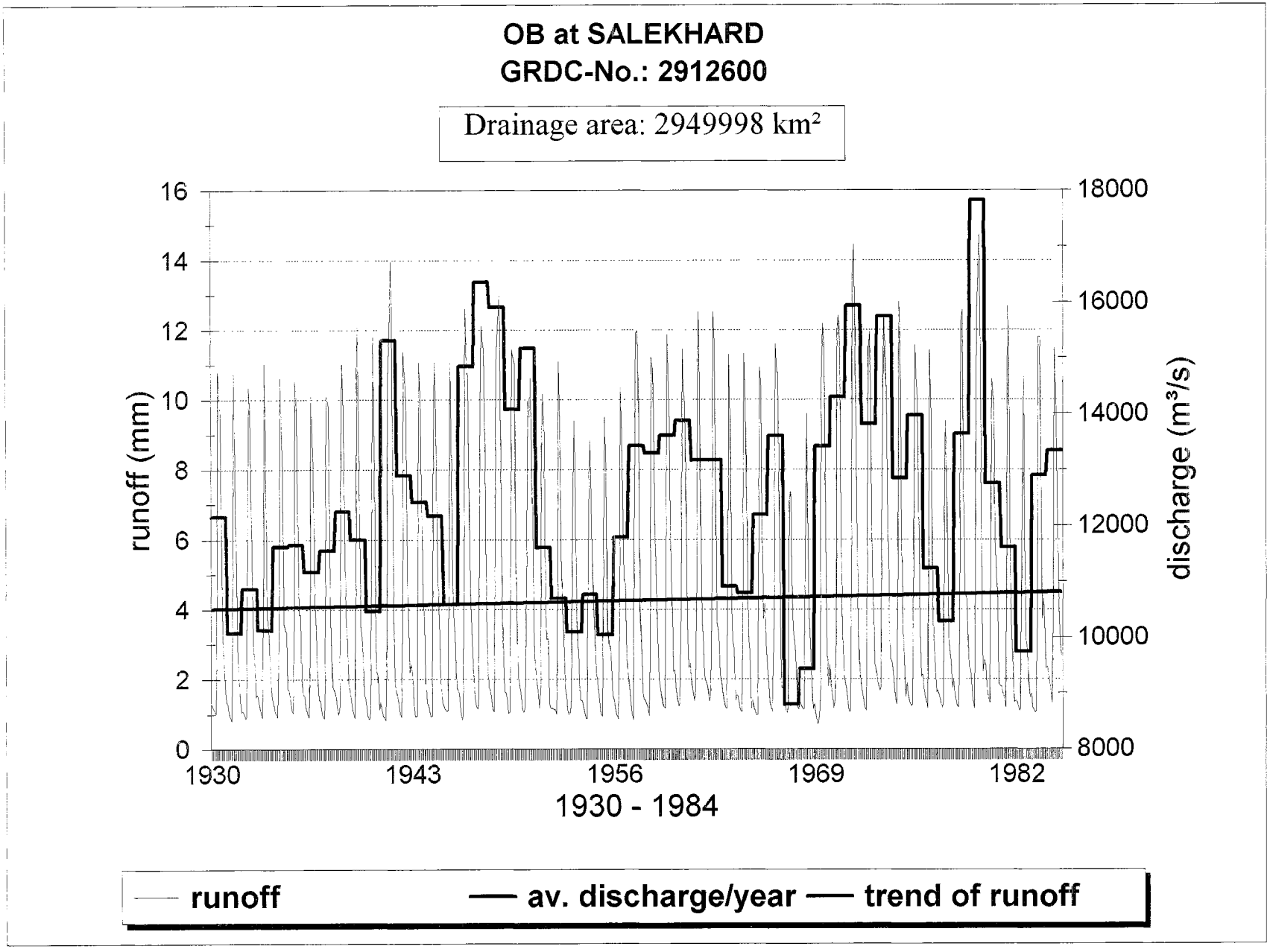

BAR EL JEBEL at MONGALLA
GRDC-No.: 1673900
drainage area: 450000 km²
runoff (mm)
discharge (m³/s)
0
1
2
3
4
5
6
7
400
600
800
1000
1200
1400
1600
1800
2000
2200
1912
1929
1946
1963
1980
1912 - 1982
runoff
av. discharge/year

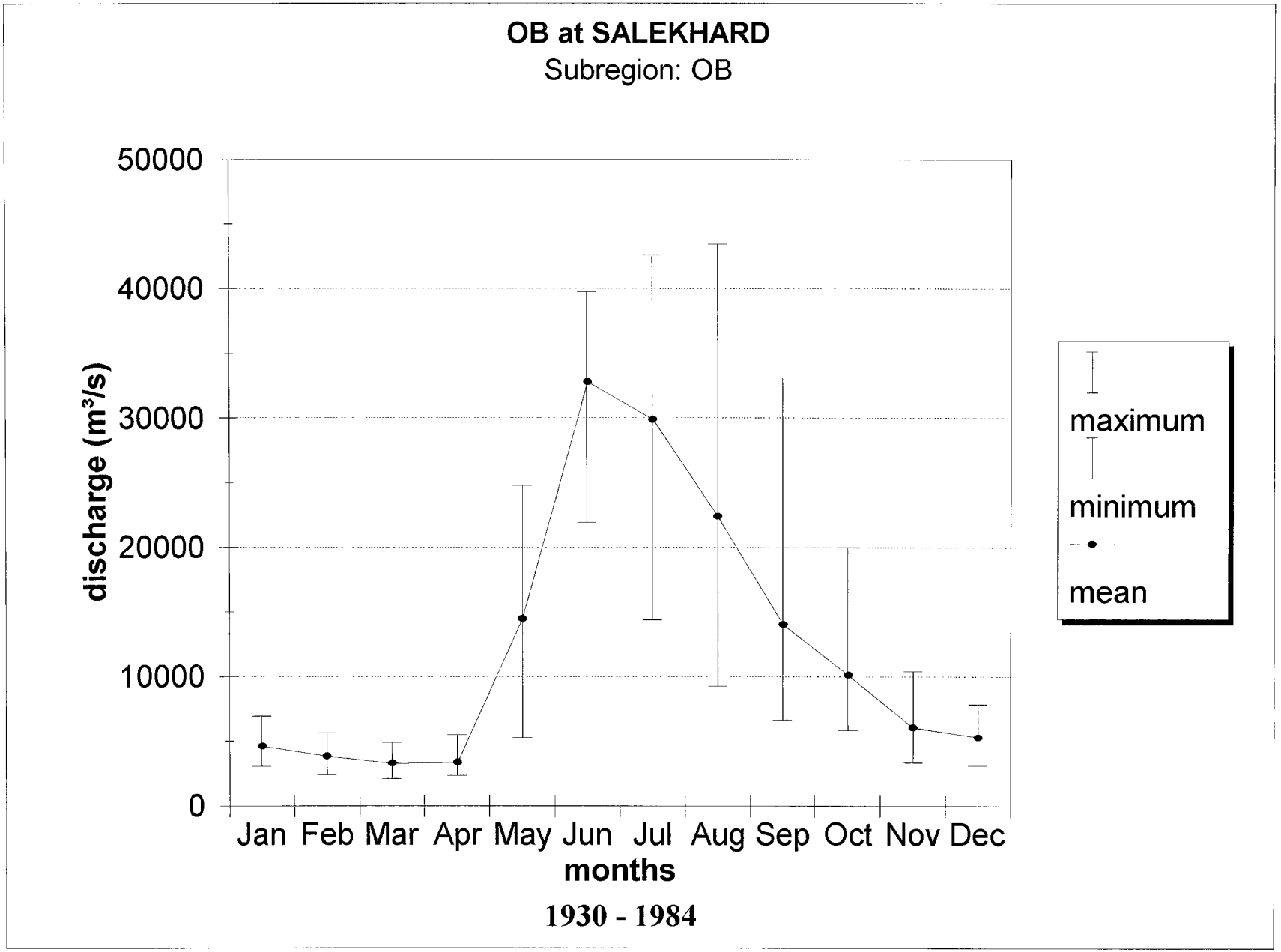

BAR EL JEBEL at MONGALLA
Subregion: NILE
discharge (m³/s)
3000
2500
2000
1500
1000
500
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1912 - 1982
maximum
minimum
mean

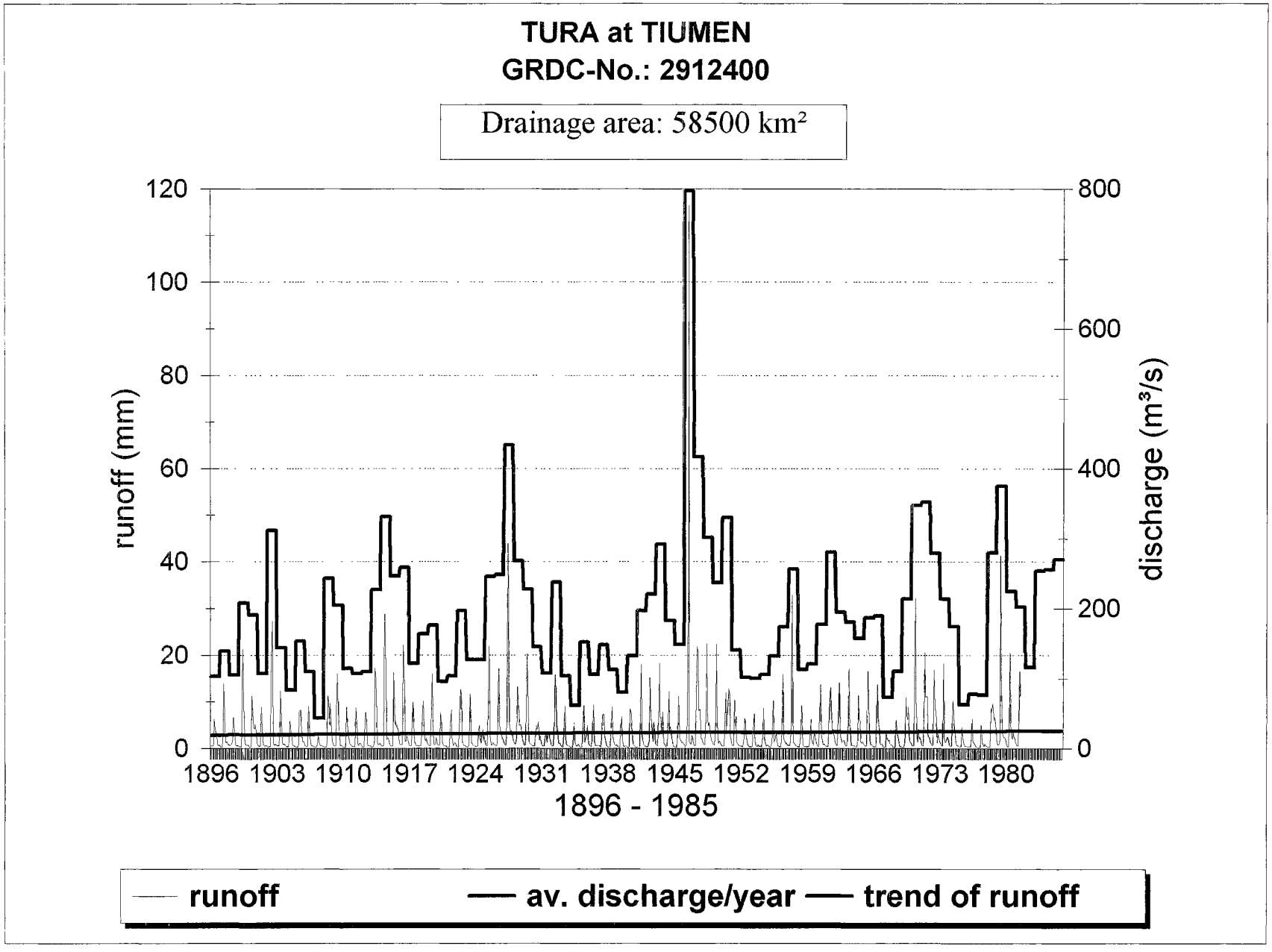
OB BASIN
GRDC - Stations
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17

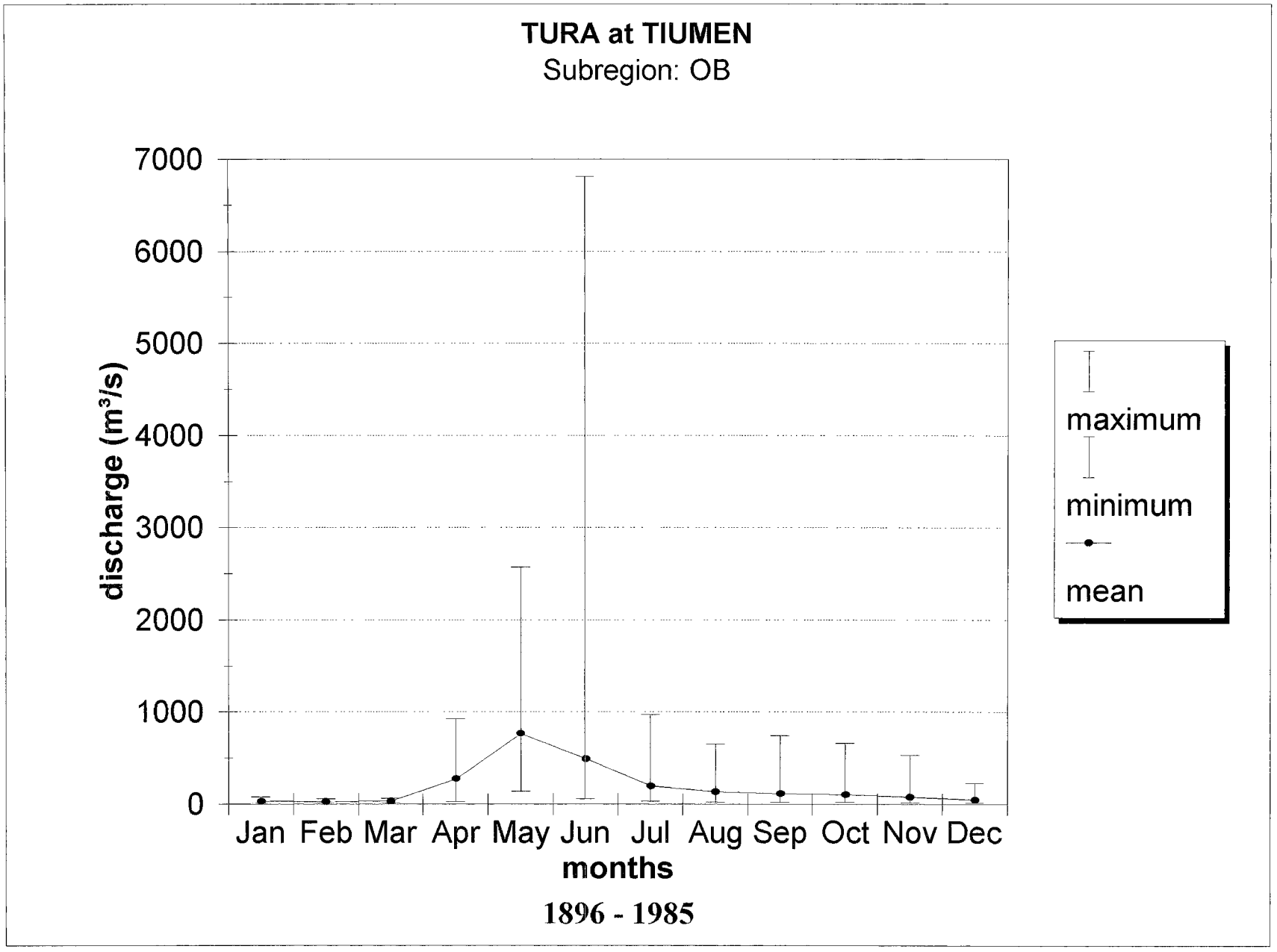
GLOBAL RUNOFF DATA CENTRE (GRDC)
20 LARGEST RIVERS

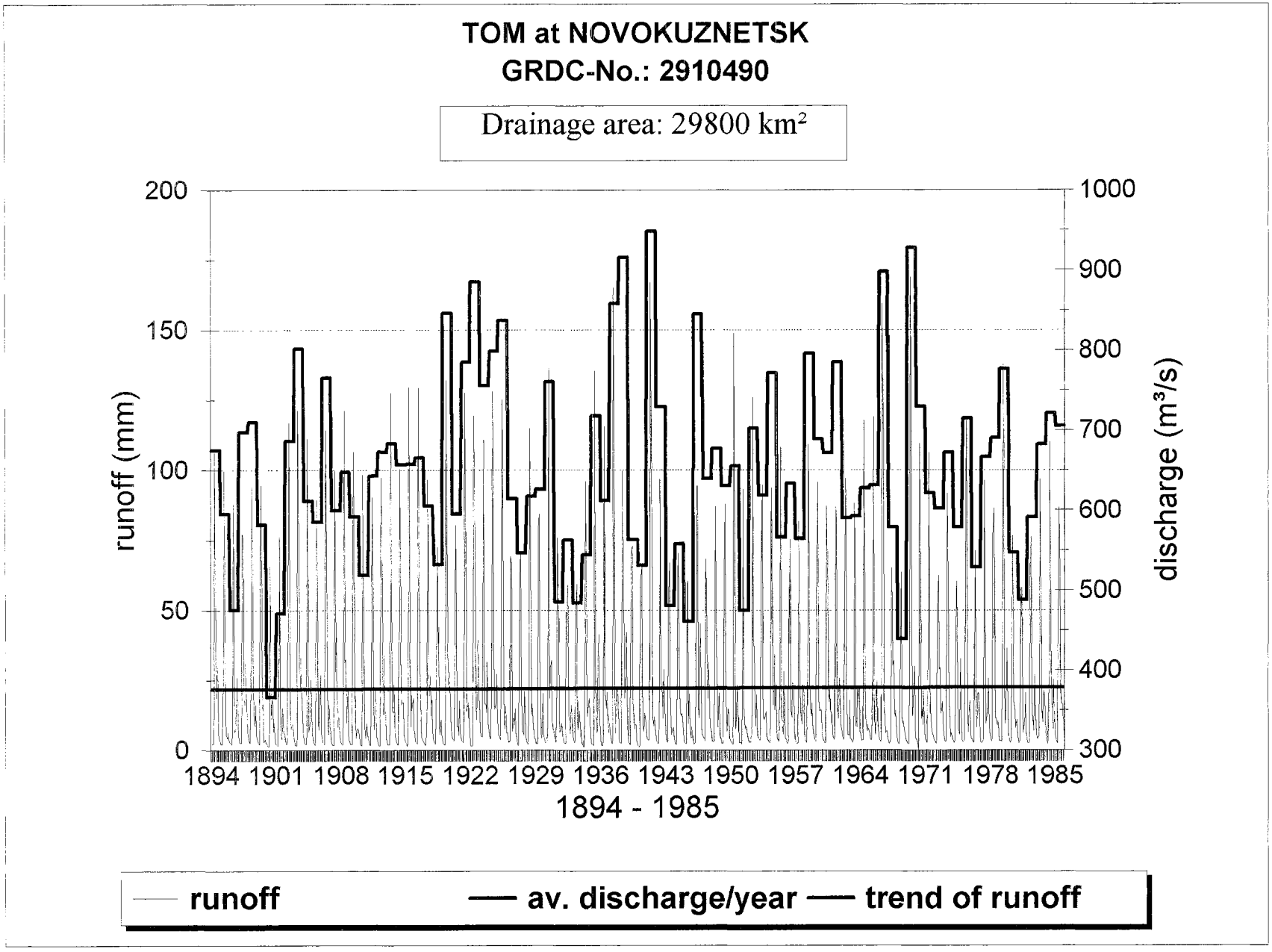
	OB							
No.	**River**	**Station**	**Area (km²)**	**Latitude**	**Longitude**	**first rec.**	**last rec.**	**day/month**
1	Bolshoi Yugan	Ugut	22100	6032N	7412E	1 1965	12 1984	M
2	Tym	Napas	24500	5990N	8192E	1 1965	12 1984	M
3	Tom	Tomsk	57000	5658N	8487E	1 1965	12 1984	M
4	Peschanaya	Tochilnoe	4720	5218N	8518E	1 1978	12 1987	D
5	Mayma	Mayma	780	5200N	8585E	1 1978	12 1987	D
6	Biya	Biysk	36900	5252N	8527E	1 1895	12 1985	M
7	Akkem	Akkem	78.9	5033N	8691E	1 1978	12 1987	D
8	Tom	Novokuznetsk	29800	5375N	8710E	1 1894	12 1985	M
9	Usa	Mezhdourechensk	3320	5364N	8810E	1 1978	12 1987	D
10	Ishim	Petropavlovsk	118000	5497N	6912E	1 1965	10 1984	M
11	Ishim	Tselinograd	7400	5111N	7146E	1 1978	12 1987	D
12	Ulba	Ulba Perevalochnaya	4900	4993N	8283E	1 1978	12 1987	D
12	Ulba	Ulba Perevalochnaya	4900	4993N	8283E	1 1965	12 1984	M
	Levaya Berezovka	Sredigorne	251			1 1978	12 1987	D
	Bergamak	Pjazany	371			1 1978	12 1987	D
	Aremzyanka	Chukmanka	478			1 1978	10 1987	D
13	Uy	Stepnoe	3600	5413N	6048E	1 1978	12 1987	D
14	Tura	Tiumen	58500	5715N	6553E	1 1896	12 1985	M
15	Lobva	Lobva	2940	5905N	6026E	1 1978	12 1987	D
15	Lobva	Lobva	2940	5905N	6026E	1 1969	12 1984	M
16	Northern Sosva	Sosva	65200	6367N	6188E	1 1965	12 1984	M
17	**Ob**	**Salekhard**	**2949998**	**6657N**	**6653E**	**1 1930**	**12 1984**	**M**
	Reshetka	Novoalekseevskoe	32			1 1978	12 1987	D
	Yalynka	Kaltiukova	62.6			1 1978	12 1987	D

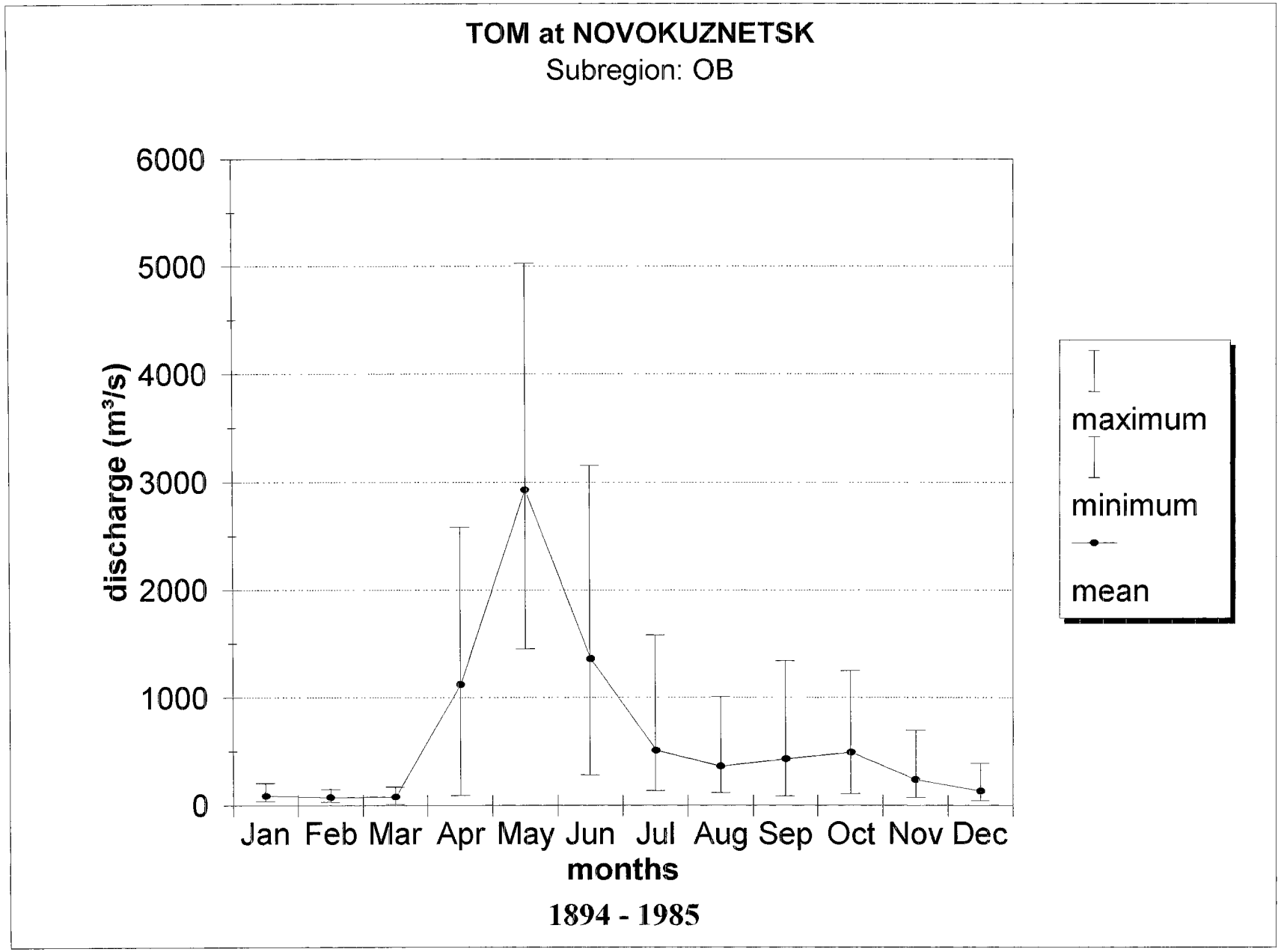

OB at SALEKHARD
GRDC-No.: 2912600
Drainage area: 2949998 km²
runoff (mm)
discharge (m³/s)
0
2
4
6
8
10
12
14
16
8000
10000
12000
14000
16000
18000
1930
1943
1956
1969
1982
1930 - 1984
runoff
av. discharge/year
trend of runoff

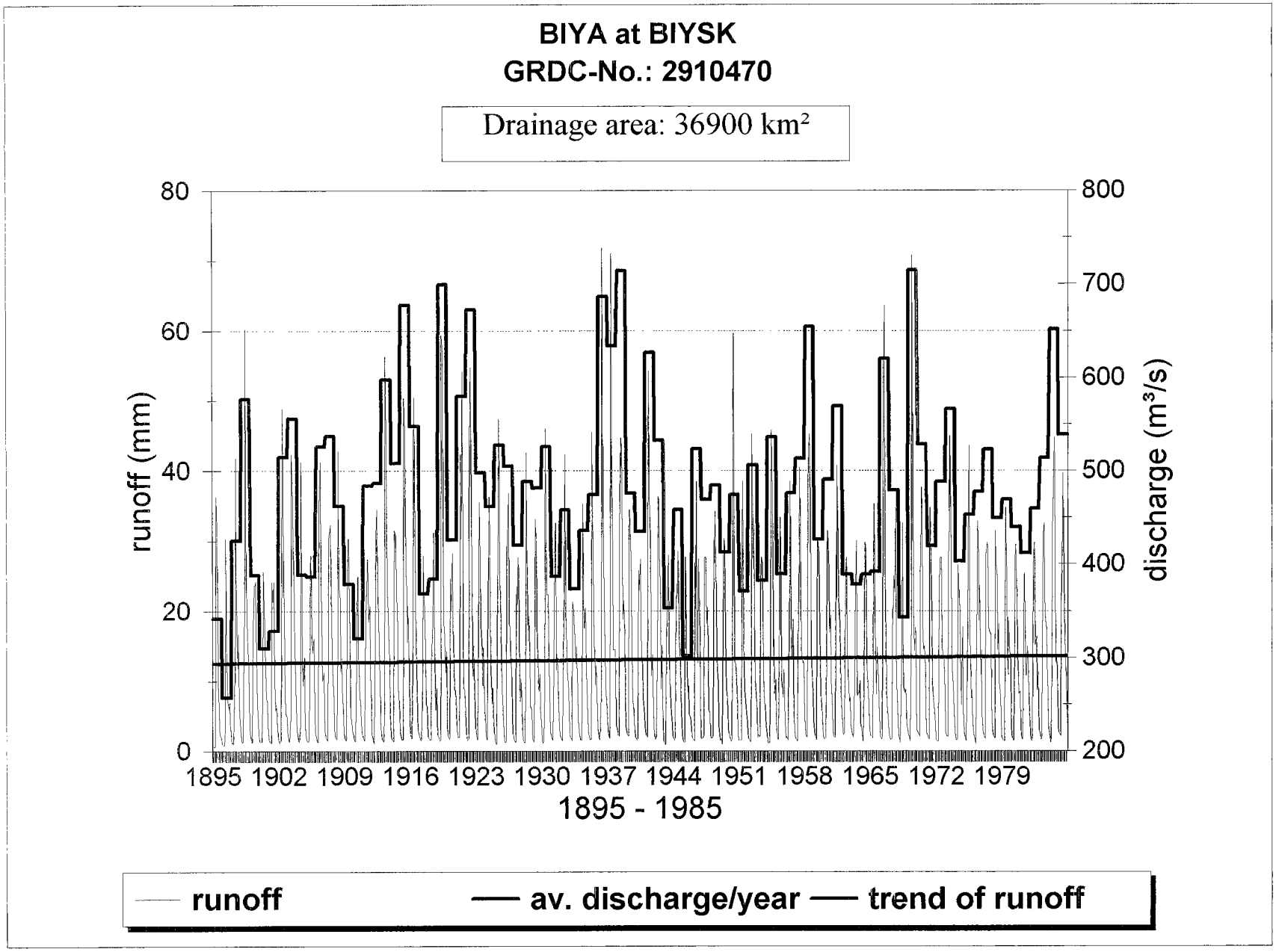

OB at SALEKHARD
Subregion: OB
50000
40000
30000
20000
10000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1930 - 1984
maximum
minimum
mean

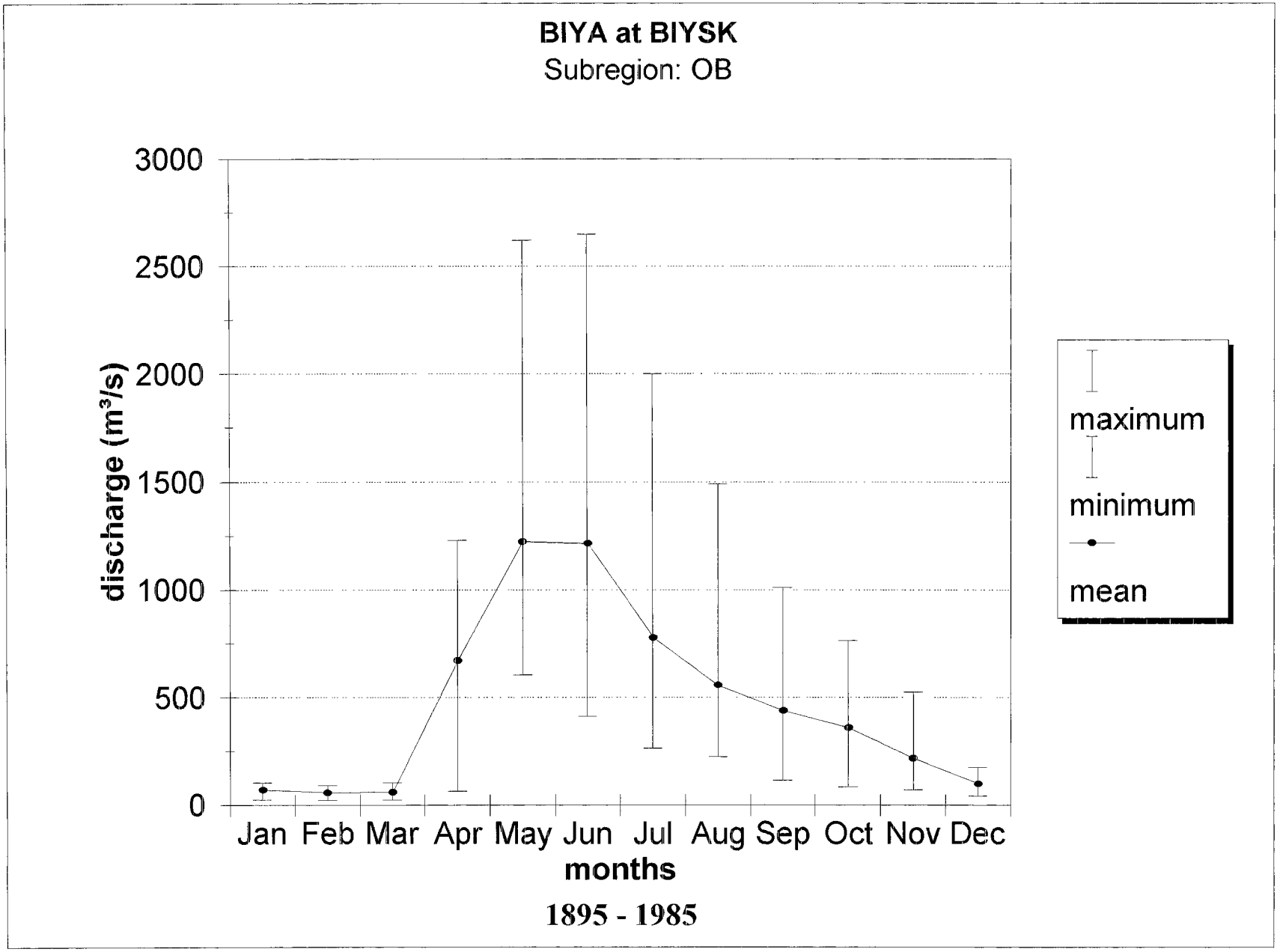

TURA at TIUMEN
GRDC-No.: 2912400
Drainage area: 58500 km²
runoff (mm)
discharge (m³/s)
120
100
80
60
40
20
0
800
600
400
200
0
1896 1903 1910 1917 1924 1931 1938 1945 1952 1959 1966 1973 1980
1896 - 1985
runoff
av. discharge/year
trend of runoff

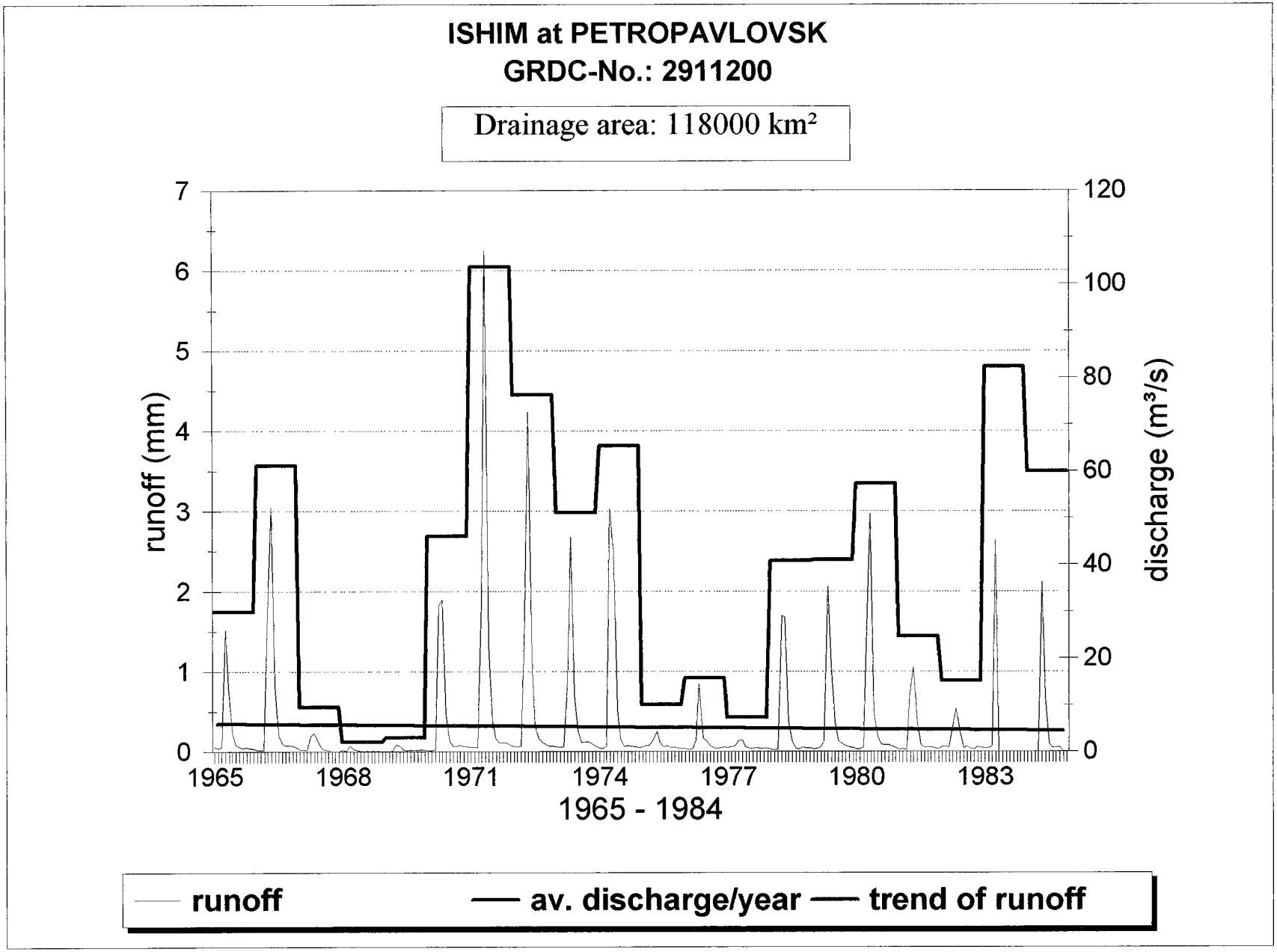

TURA at TIUMEN
Subregion: OB
7000
6000
5000
4000
3000
2000
1000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1896 - 1985
maximum
minimum
mean

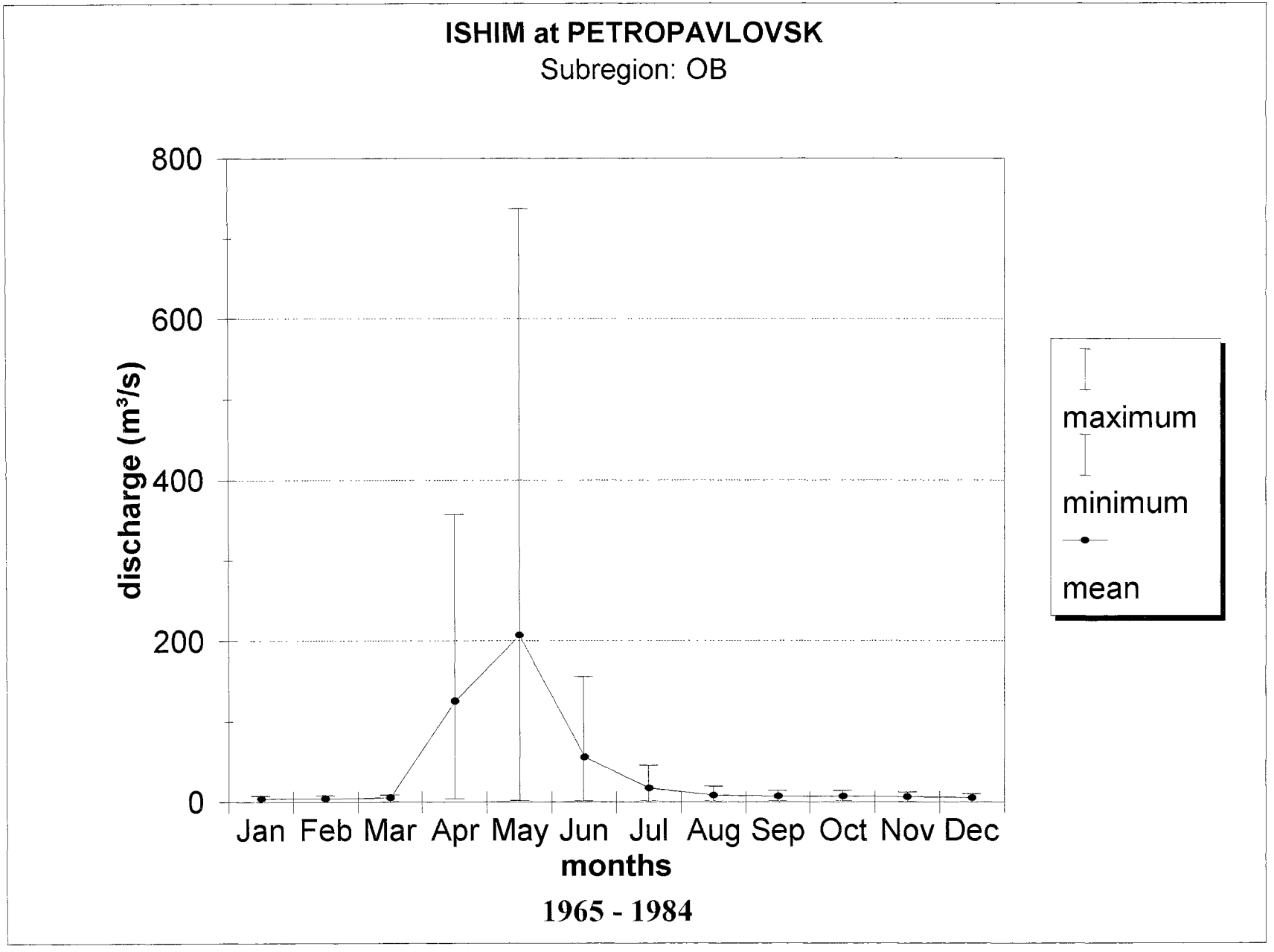

TOM at NOVOKUZNETSK
GRDC-No.: 2910490
Drainage area: 29800 km²
runoff (mm)
discharge (m³/s)
200
150
100
50
0
1000
900
800
700
600
500
400
300
1894 1901 1908 1915 1922 1929 1936 1943 1950 1957 1964 1971 1978 1985
1894 - 1985
runoff
av. discharge/year
trend of runoff

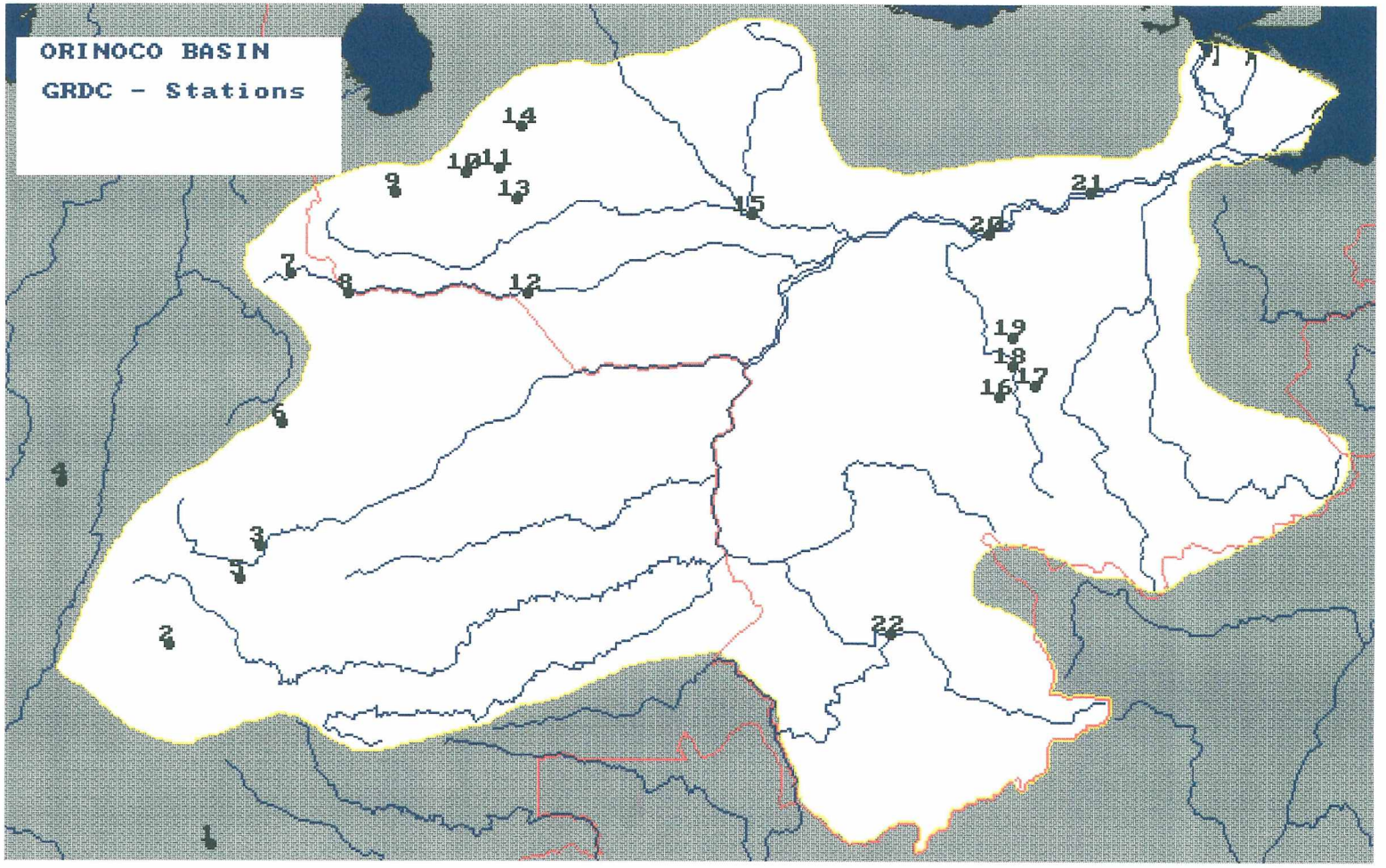

TOM at NOVOKUZNETSK
Subregion: OB
6000
5000
4000
3000
2000
1000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1894 - 1985
maximum
minimum
mean


BIYA at BIYSK
GRDC-No.: 2910470
Drainage area: 36900 km²
runoff (mm)
discharge (m³/s)
0
20
40
60
80
200
300
400
500
600
700
800
1895 1902 1909 1916 1923 1930 1937 1944 1951 1958 1965 1972 1979
1895 - 1985
runoff
av. discharge/year
trend of runoff


BIYA at BIYSK
Subregion: OB
3000
2500
2000
1500
1000
500
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
maximum
minimum
mean
1895 - 1985

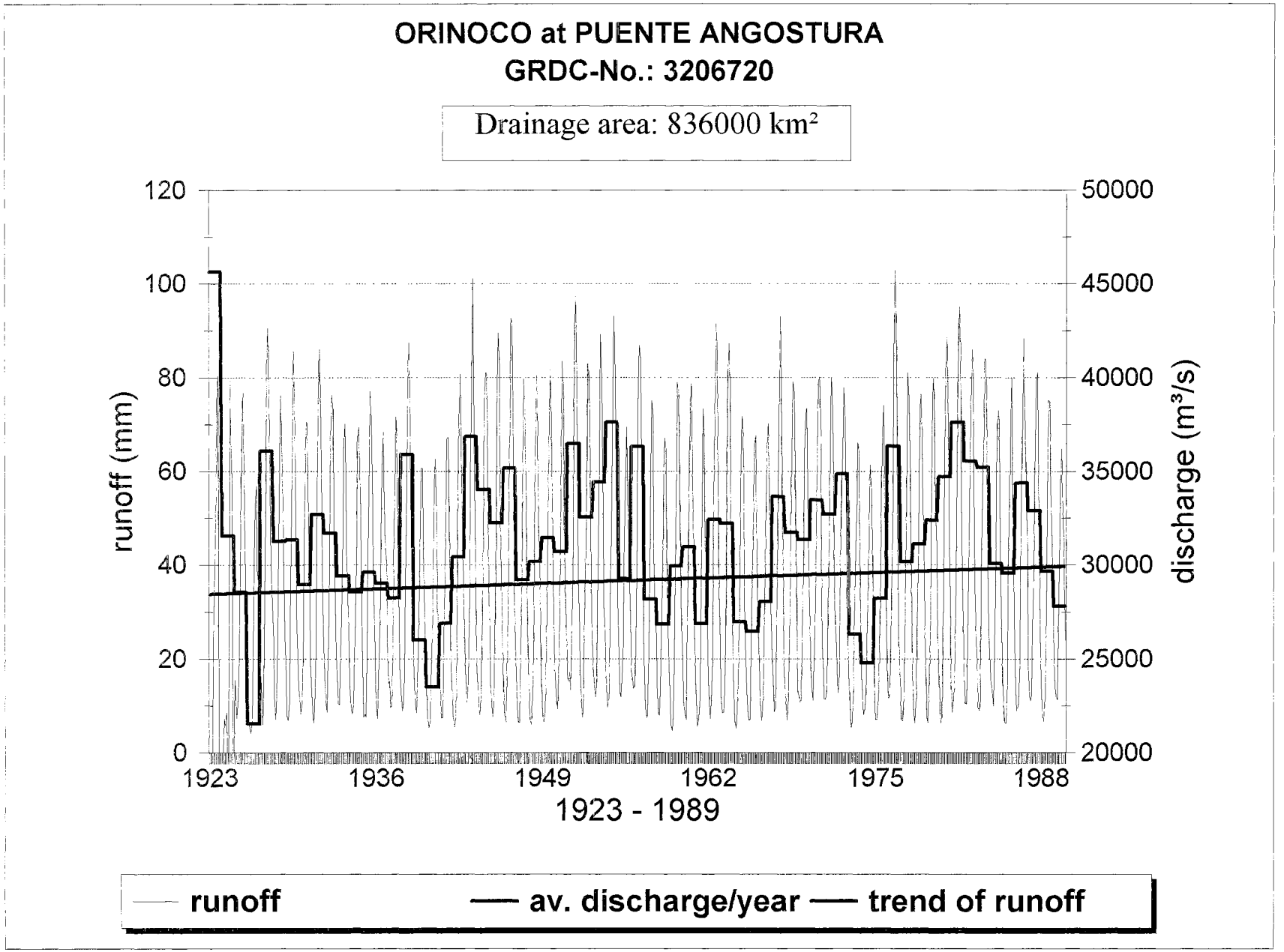

ISHIM at PETROPAVLOVSK
GRDC-No.: 2911200
Drainage area: 118000 km²
runoff (mm)
discharge (m³/s)
0
1
2
3
4
5
6
7
0
20
40
60
80
100
120
1965
1968
1971
1974
1977
1980
1983
1965 - 1984
runoff
av. discharge/year
trend of runoff

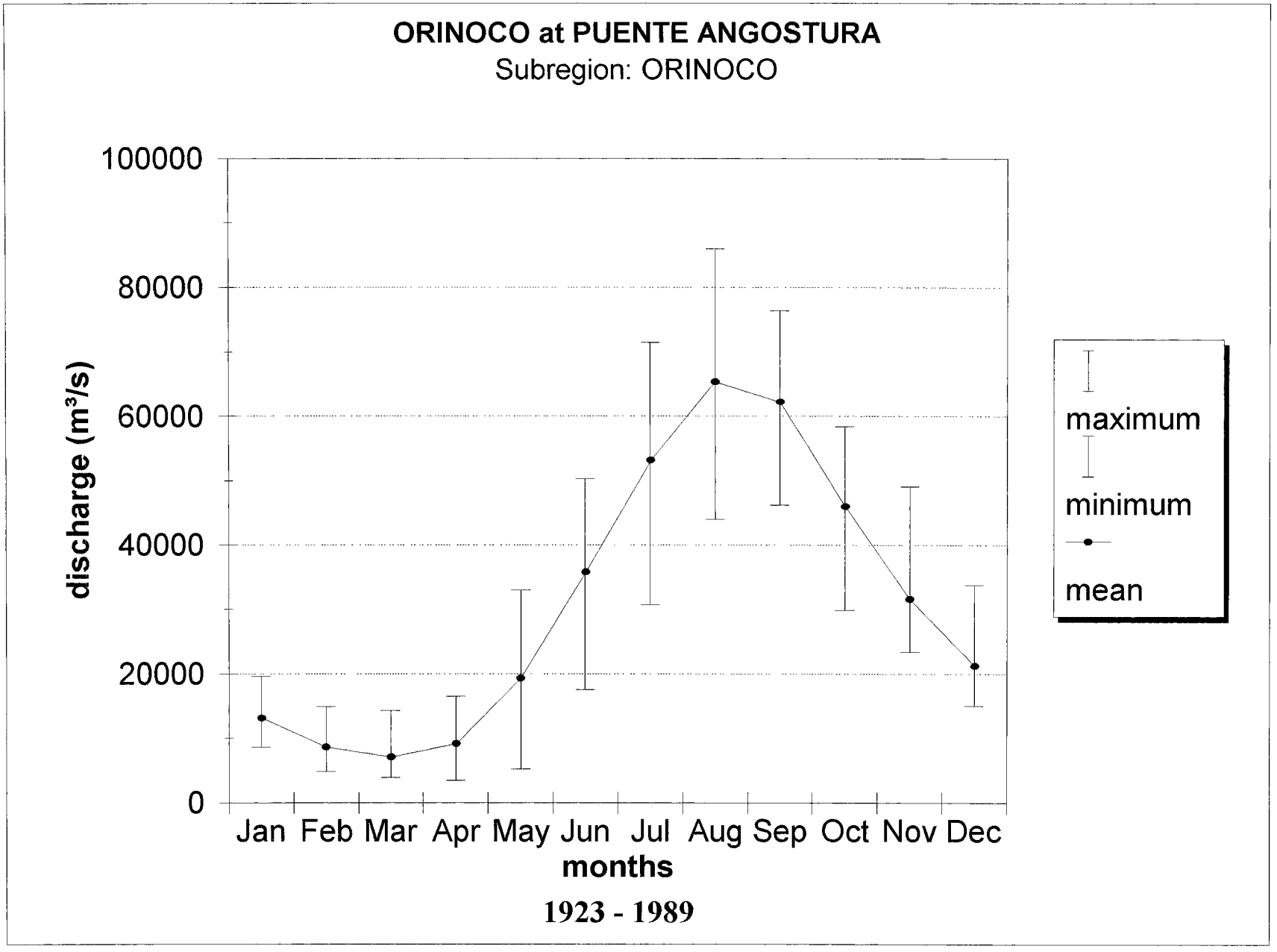

ISHIM at PETROPAVLOVSK
Subregion: OB
800
600
400
200
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1965 - 1984
maximum
minimum
mean

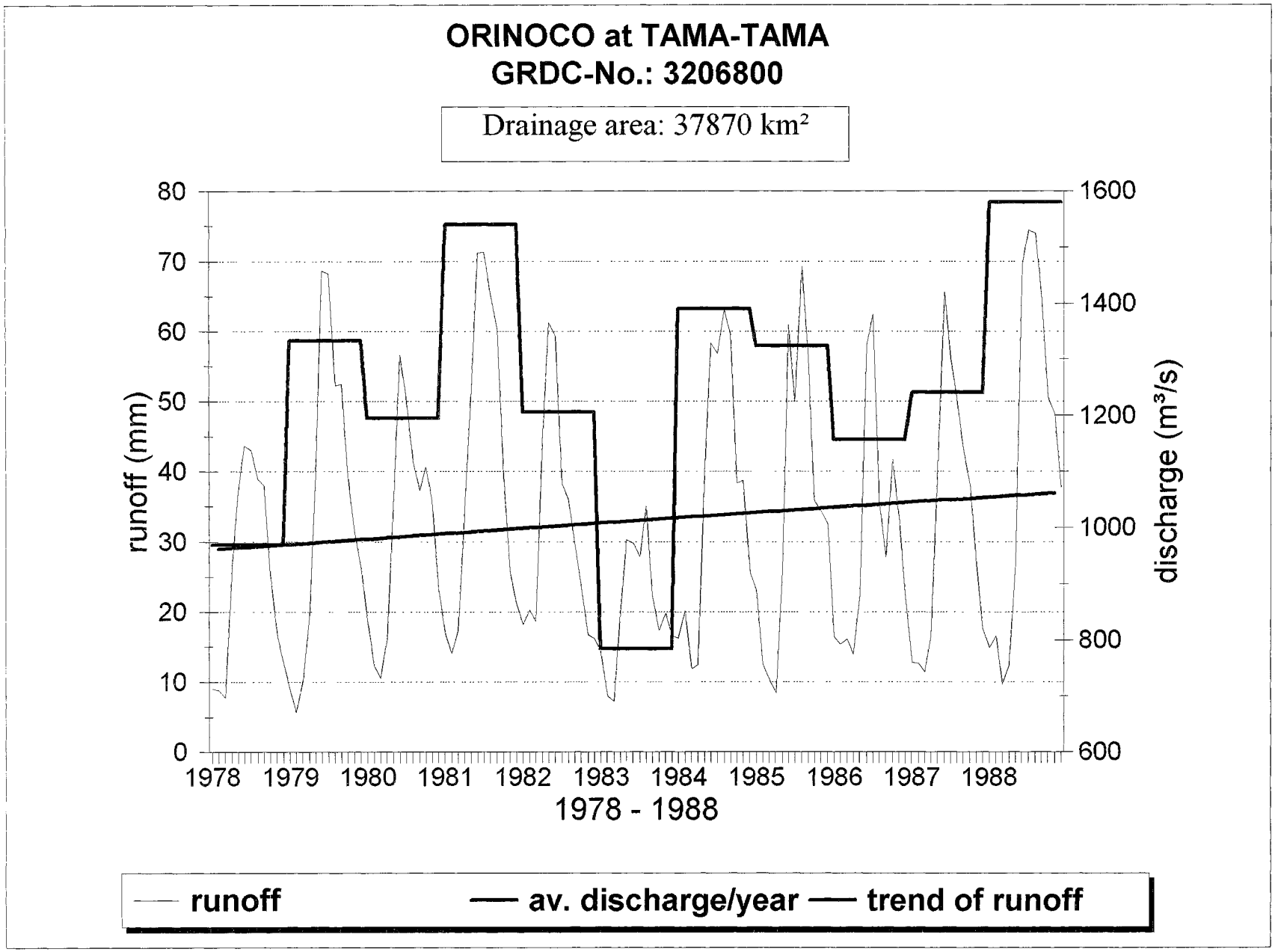

ORINOCO BASIN
GRDC - Stations
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22

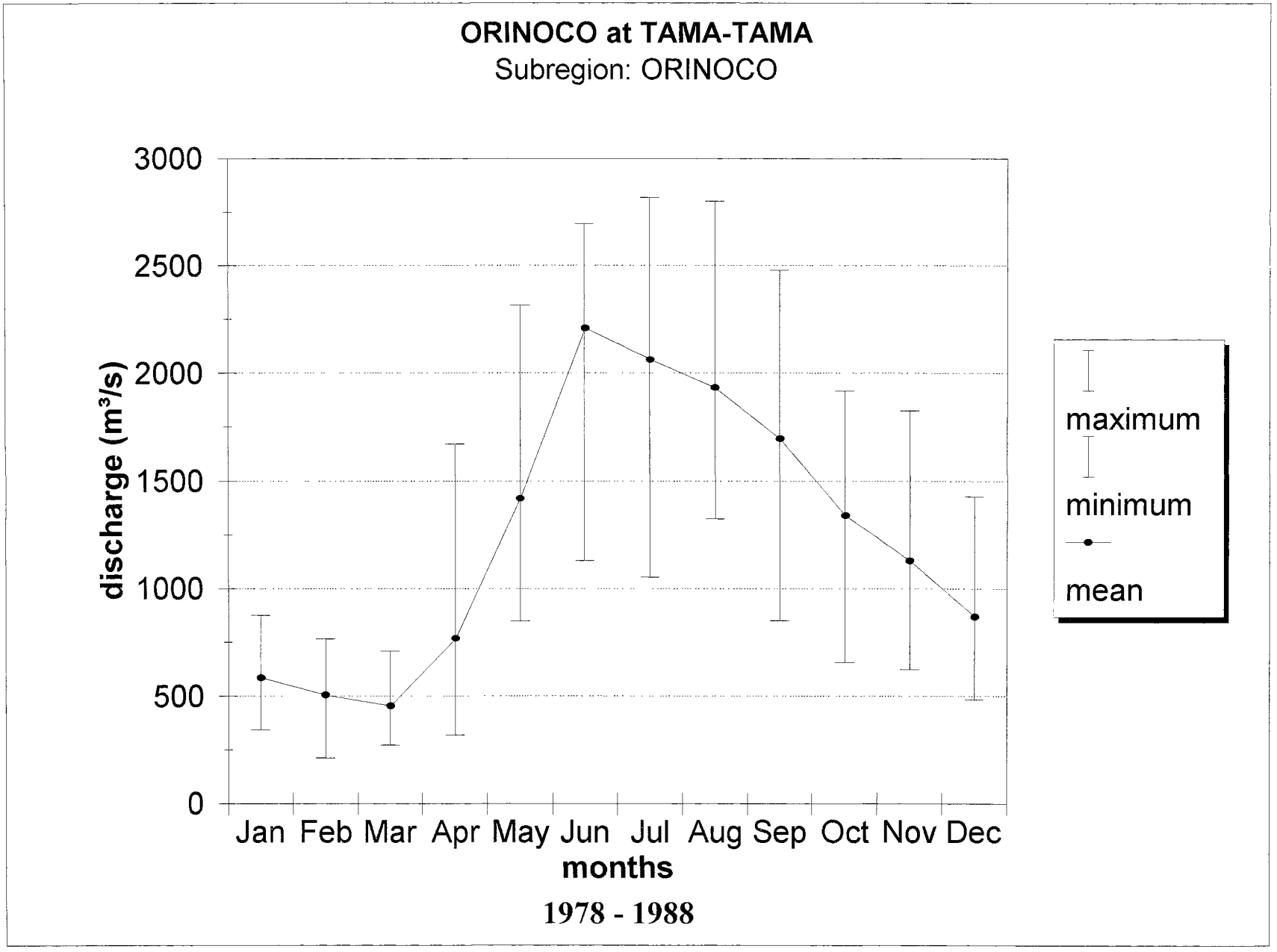
GLOBAL RUNOFF DATA CENTRE (GRDC)
20 LARGEST RIVERS

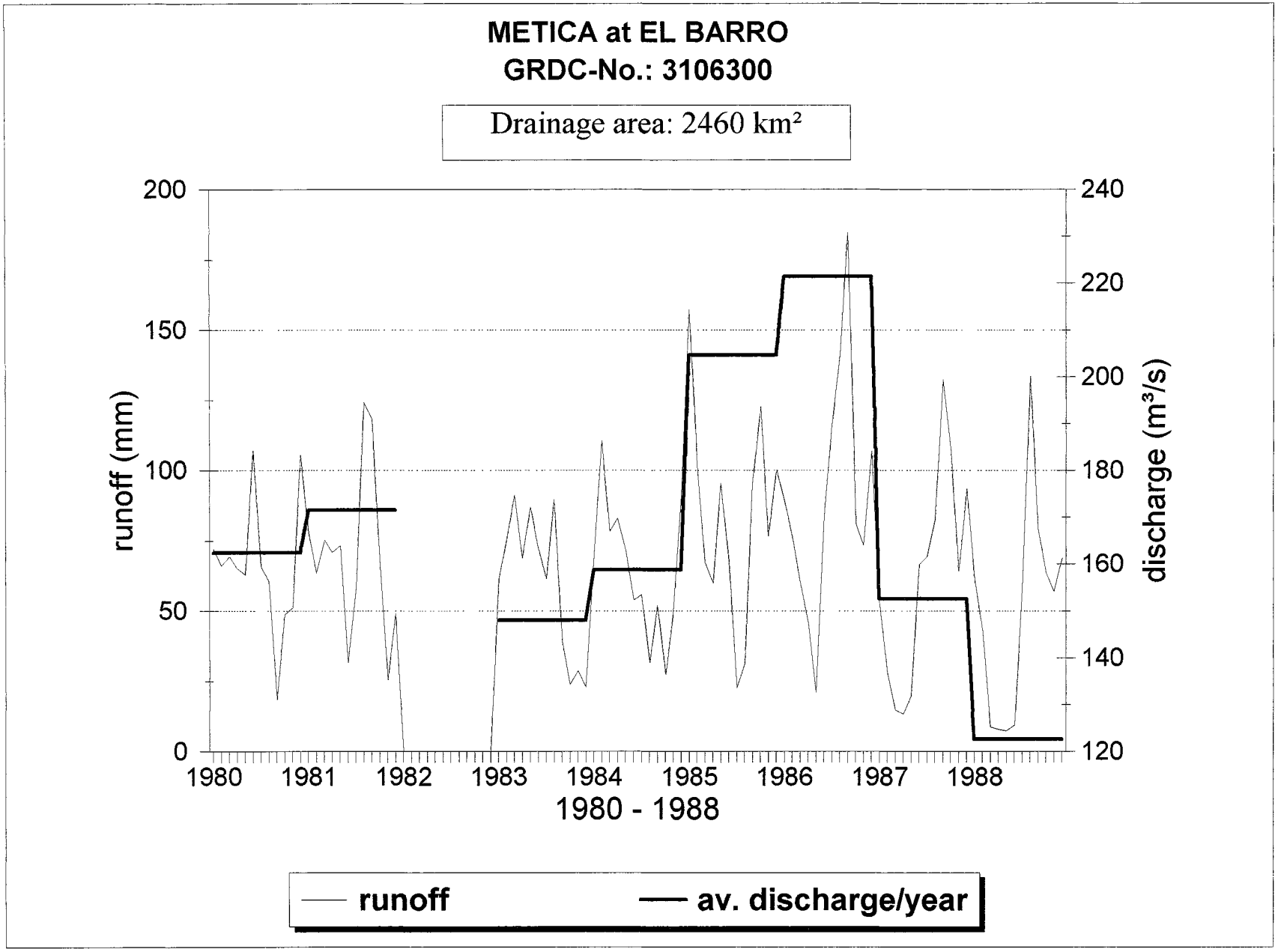
	ORINOKO							
No.	**River**	**Station**	**Area (km²)**	**Latitude**	**Longitude**	**first rec.**	**last rec.**	**day/month**
1	Guavio	Ubala	1057	472N	7353W	1 1976	12 1979	M
2	Prado	Boqueron		300N	7400W	1 1971	12 1972	M
3	Meta	Pte Lleras		412N	7297W	1 1980	12 1984	M
4	Lengupa	San Agustin	1641	485N	7523W	1 1978	12 1988	D
5	Metica	el Barro	2460	375N	7320W	1 1980	12 1988	D
6	Cusiana	Vado Hondo	152	552N	7277W	1 1978	12 1988	D
7	Chitaga	Pte.Lopez	872	720N	7263W	1 1978	12 1988	D
8	Uribante	Pte Uribante		700N	7200W	1 1973	12 1975	M
9	Canagua	Canagua		813N	7145W	1 1978	12 1988	D
10	Acequia	Puente la Acequia	478	839N	7068W	1 1978	12 1988	D
11	Paguey	el Paso	810	851N	7046W	1 1978	12 1988	D
12	Arauca	Pte.Internacional		700N	7000W	1 1973	12 1975	M
13	Masparro	Pte.Masparro		800N	7000W	1 1973	12 1975	M
14	Bocono	Pena Larga	1578	890N	7005W	1 1973	12 1975	M
15	Apure	San Fernando	114500	790N	6743W	1 1973	12 1975	M
16	Erebato	el Perro	11610	590N	6449W	1 1978	12 1988	D
17	Caura	Entre Rios		593N	6442W	1 1978	12 1988	D
18	Caura	Dos Aguas	25000	597N	6443W	1 1978	12 1988	D
19	Caura	Pie de Salto		631N	6448W	1 1978	12 1988	D
	Manzanares	Guaripa	883	1036N	6416W	1 1978	12 1988	D
20	Orinoco	Musinacio	787000	767N	6478W	1 1973	12 1975	M
21	**Orinoco**	**Puente Angostura**	**836000**	**815N**	**6360W**	**5 1923**	**12 1989**	**D**
22	Orinoco	Tama-Tama	37870	312N	6587W	1 1978	12 1988	D

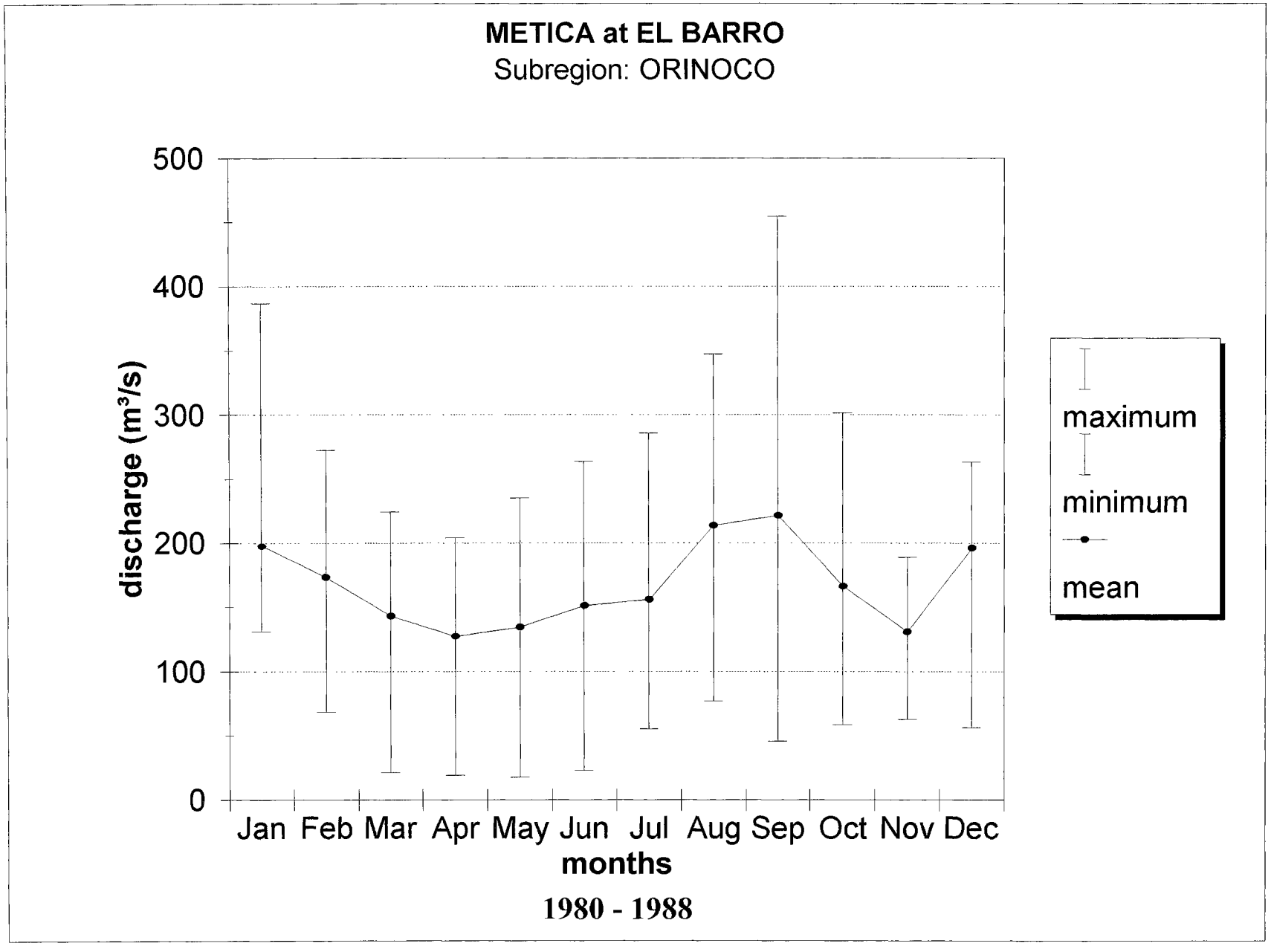

ORINOCO at PUENTE ANGOSTURA
GRDC-No.: 3206720
Drainage area: 836000 km²
runoff (mm)
discharge (m³/s)
120
100
80
60
40
20
0
50000
45000
40000
35000
30000
25000
20000
1923
1936
1949
1962
1975
1988
1923 - 1989
runoff
av. discharge/year
trend of runoff

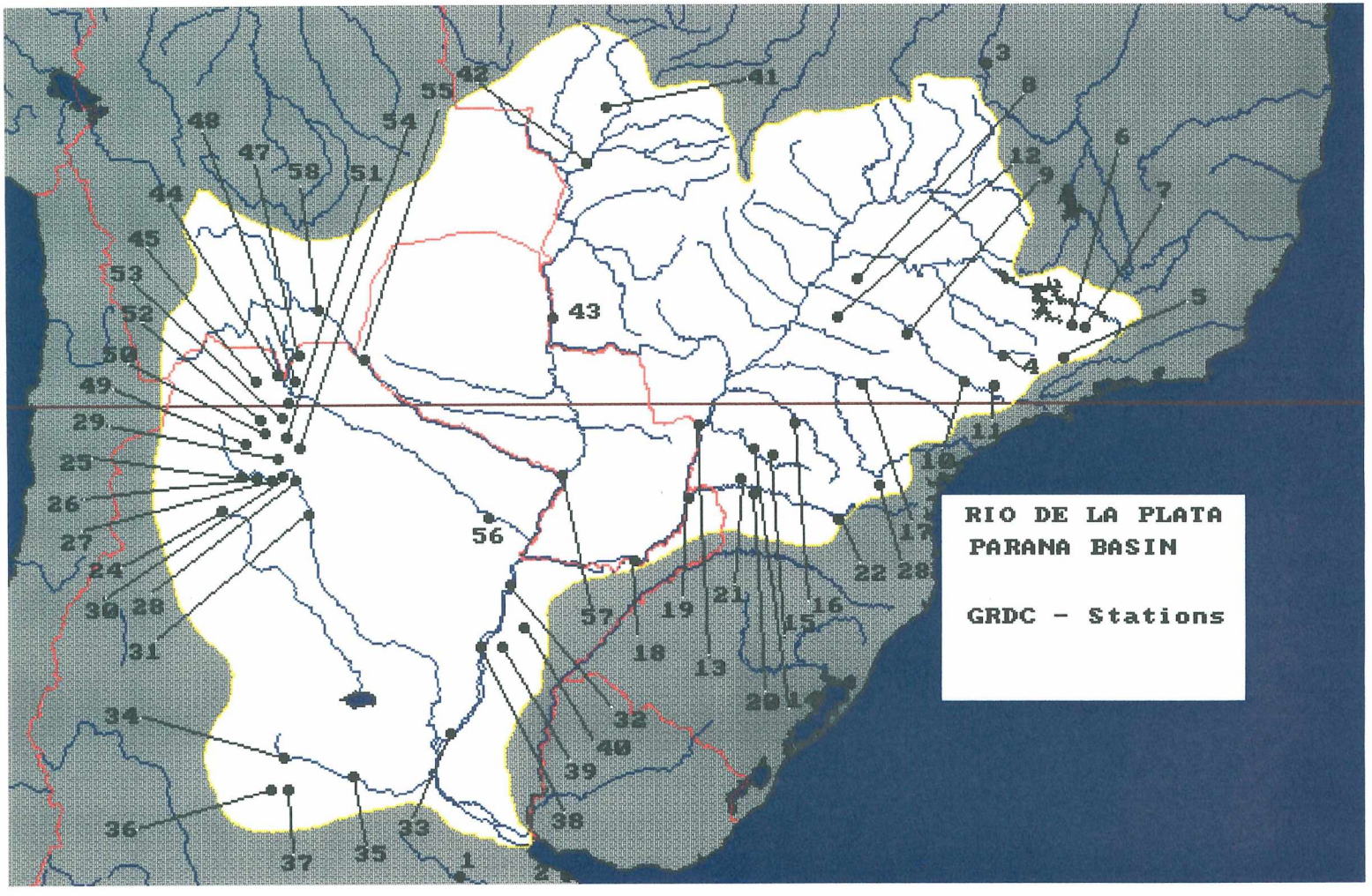

ORINOCO at PUENTE ANGOSTURA
Subregion: ORINOCO
100000
80000
60000
40000
20000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
maximum
minimum
mean
1923 - 1989

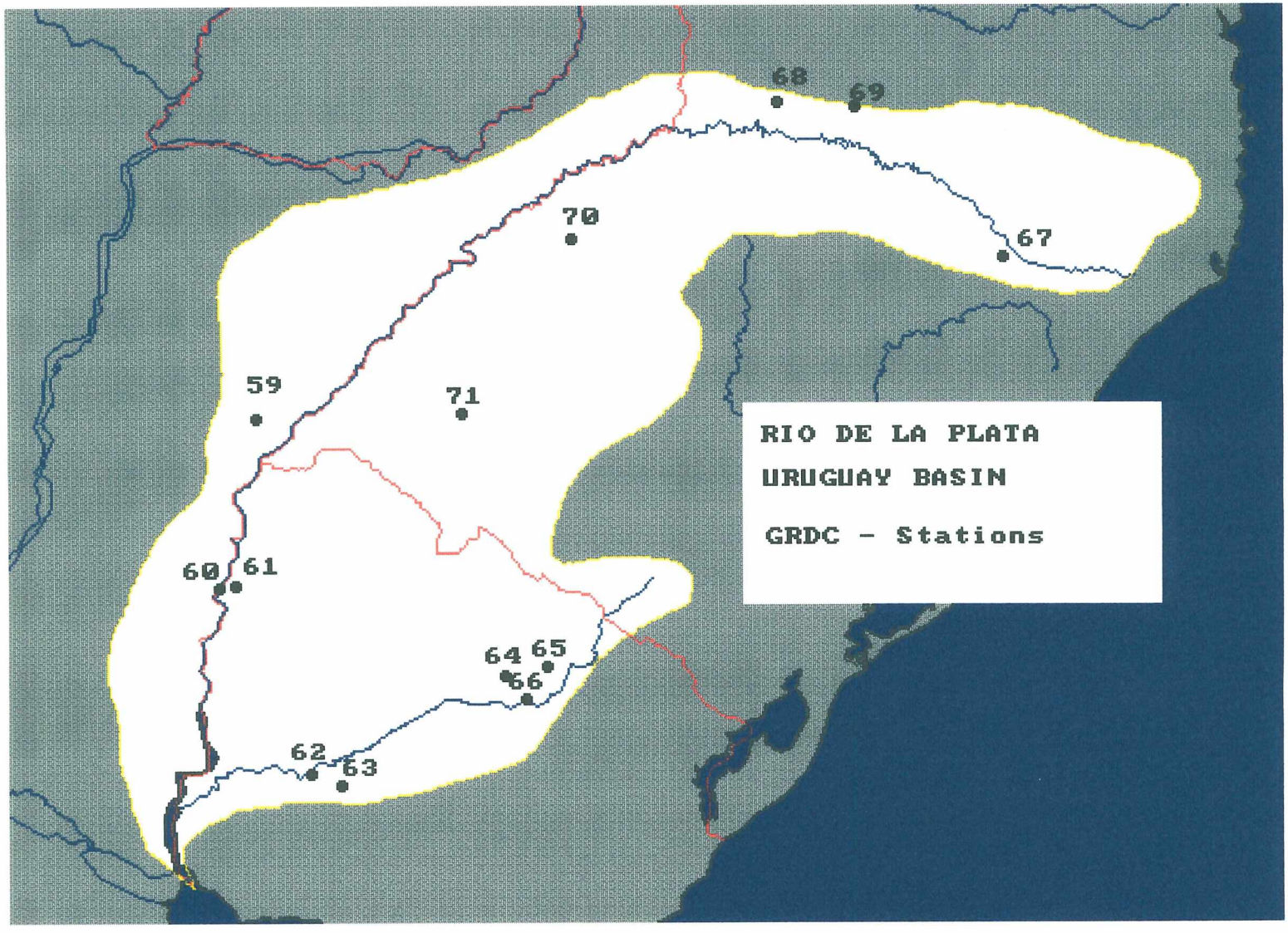

ORINOCO at TAMA-TAMA
GRDC-No.: 3206800
Drainage area: 37870 km²
runoff (mm)
discharge (m³/s)
0
10
20
30
40
50
60
70
80
600
800
1000
1200
1400
1600
1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988
1978 - 1988
runoff
av. discharge/year
trend of runoff


ORINOCO at TAMA-TAMA
Subregion: ORINOCO
discharge (m³/s)
3000
2500
2000
1500
1000
500
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1978 - 1988
maximum
minimum
mean


METICA at EL BARRO
GRDC-No.: 3106300
Drainage area: 2460 km²
runoff (mm)
discharge (m³/s)
200
150
100
50
0
240
220
200
180
160
140
120
1980
1981
1982
1983
1984
1985
1986
1987
1988
1980 - 1988
runoff
av. discharge/year


METICA at EL BARRO
Subregion: ORINOCO
500
400
300
200
100
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
maximum
minimum
mean
1980 - 1988


RIO DE LA PLATA
PARANA BASIN
GRDC - Stations


68
69
70
67
59
71
RIO DE LA PLATA
URUGUAY BASIN
GRDC - Stations
60
61
64
65
66
62
63

GLOBAL RUNOFF DATA CENTRE (GRDC)
20 LARGEST RIVERS

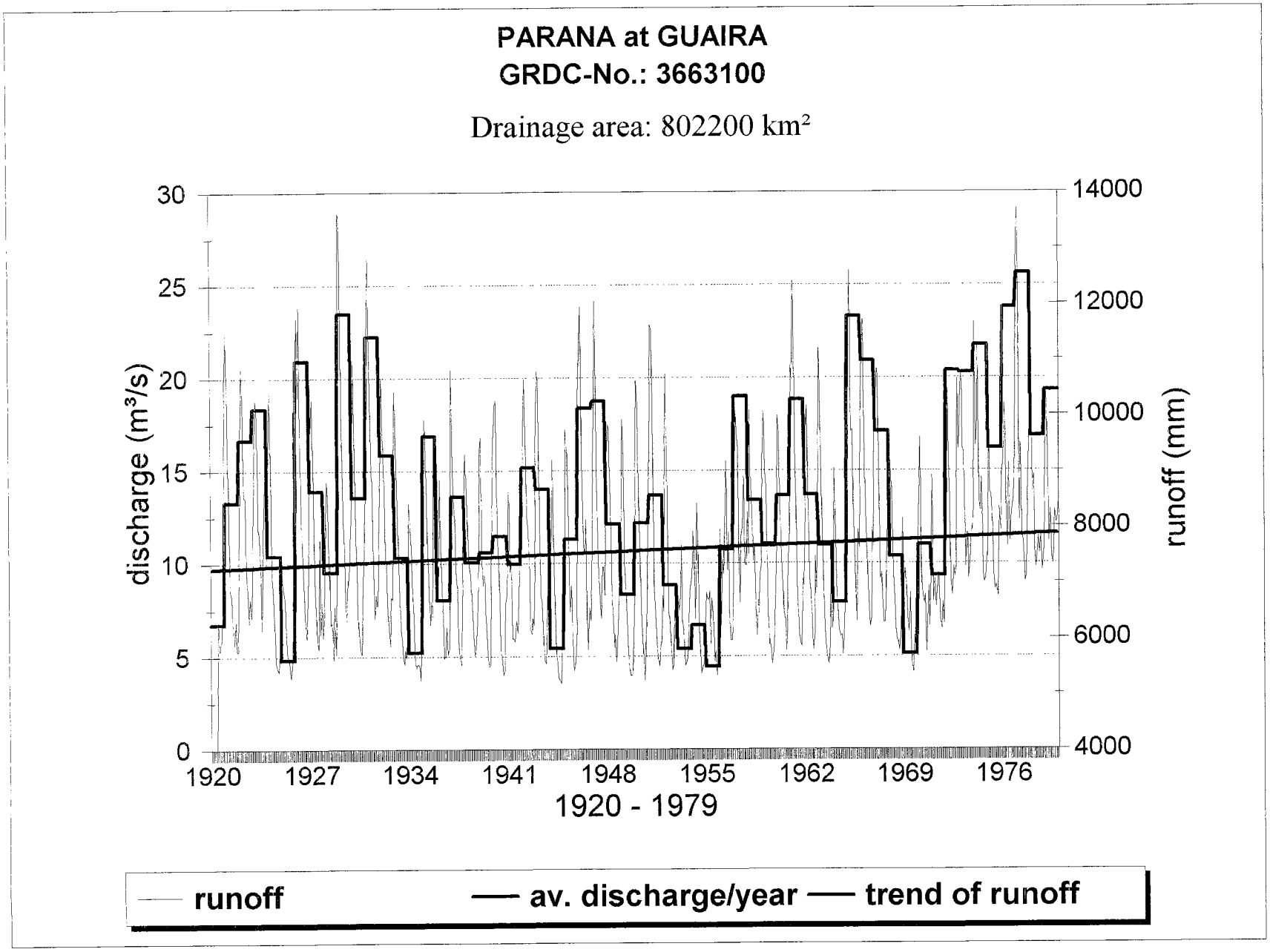
	RIO DE LA PLATA							table 1
No.	River	Station	Area (km²)	Latitude	Longitude	first rec.	last rec.	day/month
1	Salado	Achupallas	29000	3508S	6012W	2 1976	4 1978	M
2	Salado	H.C.Casanas		3500S	5700W	3 1968	12 1975	M
3	Rio Sao Bartolomeu	Df-18	2148	1523S	4723W	1 1978	12 1980	D
4	Rio Moji-Guacu	Moji-Guacu Ii	3750	2236S	4691W	1 1978	12 1979	D
5	Rio Sapucai	Itajuba	869	2241S	4545W	1 1978	12 1978	D
6	Rio Peixe	Chacara Santana	851	2168S	4523W	1 1978	12 1978	D
7	Rio Aiuruoca	Fazenda Laranjeiras	2087	2168S	4435W	1 1978	12 1978	D
8	Rio Sao Jose Dos Duorados	General Salgado	2290	2048S	5038W	1 1978	12 1978	D
9	Rio Batalha	Reginipolis	1922	2188S	4923W	1 1978	12 1978	D
10	Rio Sorocaba	Laranjal Paulista	4751	2303S	4781W	1 1978	12 1978	D
11	Rio Jundiai	Itaici	785	2311S	4718W	1 1978	12 1978	D
12	Rio Aguapei	Salto Carlos Botelho	5544	2145S	5091W	1 1978	12 1978	D
13	Parana	Guaira	802200	2407S	5425W	7 1920	12 1979	M
14	Rio Goio Bang	Ponte do Goio Bang	1350	2461S	5293W	1 1978	12 1980	D
15	Rio Cantu	Balsa do Cantu	2513	2475S	5270W	1 1978	12 1980	D
16	Rio Corumbatai	Barbosa Ferraz	3294	2401S	5195W	1 1978	12 1980	D
17	Rio Das Cinzas	Andira	5622	2308S	5028W	1 1978	12 1980	D
18	Parana	Posadas	975000	2737S	5588W	1 1965	12 1979	M
19	Uruguai	Puente Viejo Ruta 12	2294	2587S	5453W	3 1953	2 1977	M
20	Rio Chopin	Aguas do Vere	6696	2576S	5293W	1 1978	12 1980	D
21	Iguacu	Salto Ozorio	46400	2555S	5305W	1 1941	11 1975	M
22	Rio Timbo	Santa Cruz do Timbo	2614	2638S	5086W	1 1978	12 1980	D
23	Rio Iguacu	Porto Amazonas	3662	2555S	4988W	1 1978	12 1980	D
24	Calchaqui	la Punilla	19800	2610S	6583W	9 1948	6 1968	M
25	Arias	San Gabriel	7100	2528S	6538W	10 1941	12 1969	M
26	Juramento	Cabra Corral (1967: la Puerta)	31900	2530S	6532W	9 1934	8 1968	M
27	Pasaje	Miraflores	34500	2537S	6483W	1 1929	8 1980	M
28	Rosario (Horcones)	Toma de Ovando	2400	2540S	6403W	9 1948	8 1967	M
29	Medina	Desembocadura Al Pasaje	1650	2533S	6450W	9 1977	8 1983	D
29	Medina	Desembocadura Al Pasaje	1650	2533S	6450W	4 1942	8 1980	M
30	Pasaje	el Tunal	38000	2523S	6447W	9 1941	8 1980	M

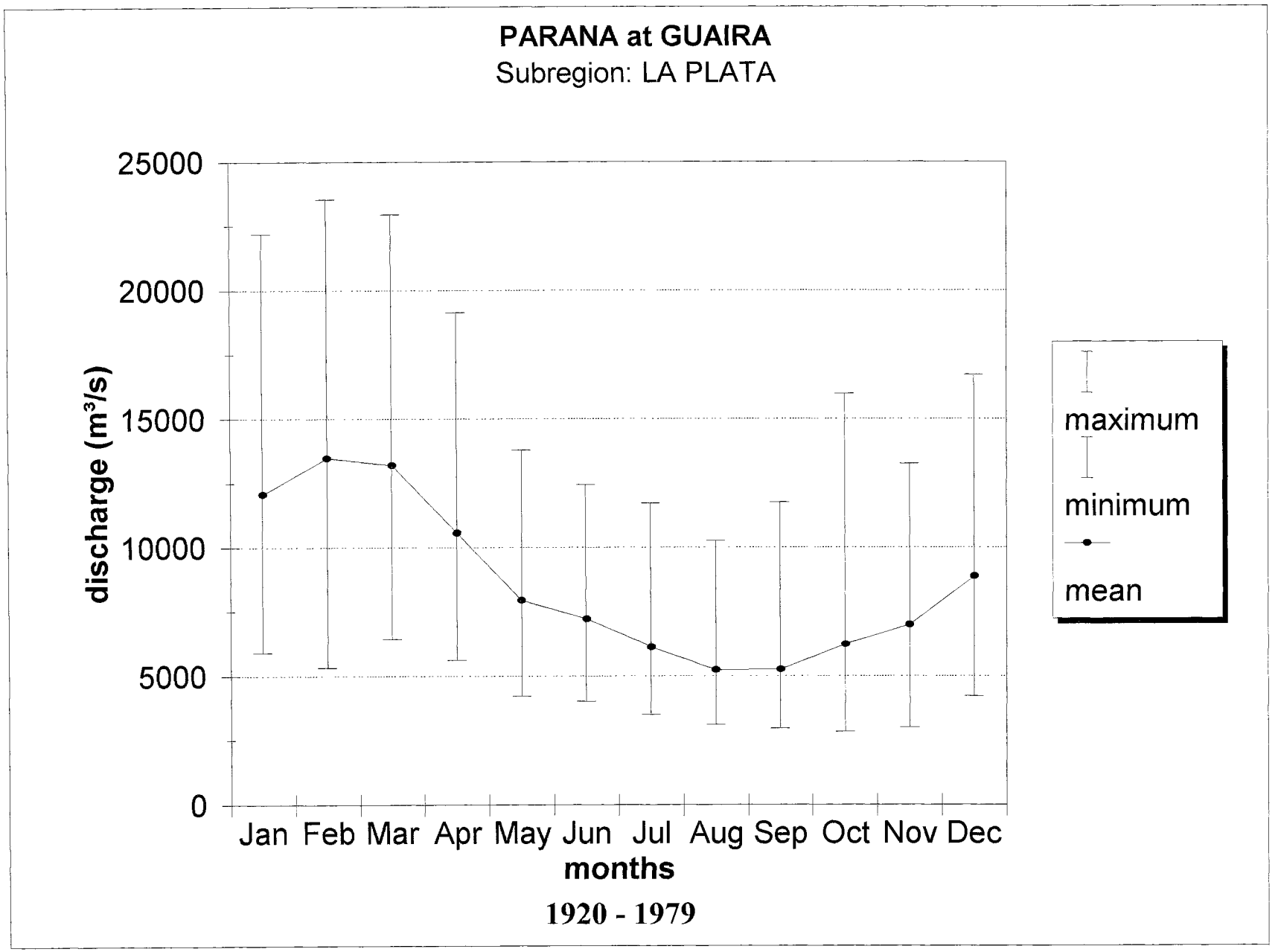
GLOBAL RUNOFF DATA CENTRE (GRDC)
20 LARGEST RIVERS

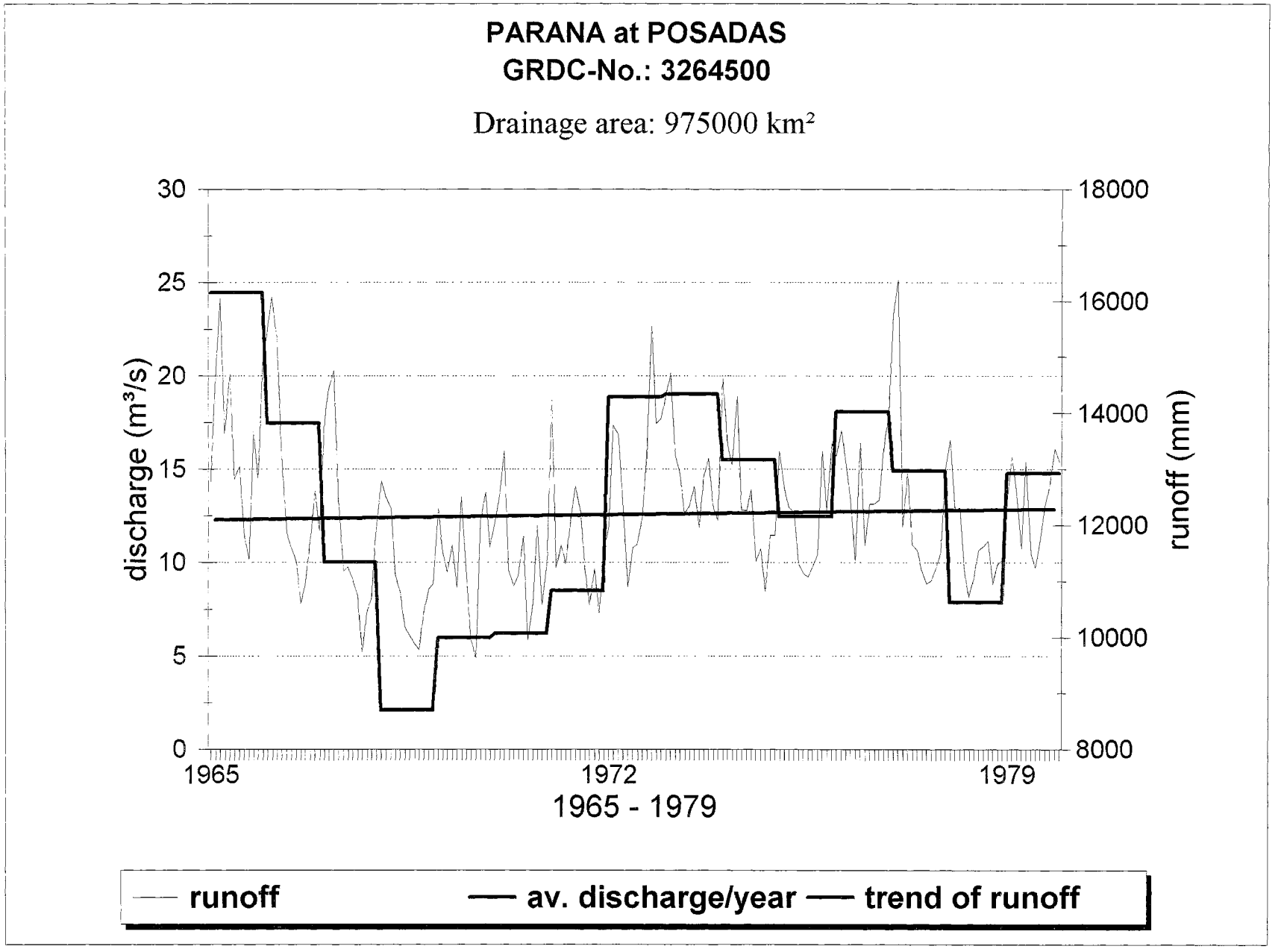
	RIO DE LA PLATA							table 2
No.	River	Station	Area (km²)	Latitude	Longitude	first rec.	last rec.	day/month
31	Salado	el Arenal	40000	2622S	6375W	9 1929	8 1980	M
32	Parana	Corrientes	1950000	2797S	5885W	9 1904	8 1983	M
33	Parana	Chapeton		3157S	6033W	9 1975	8 1980	M
34	Tercero	Embalse	3300	3217S	6438W	9 1913	8 1980	M
35	Tercero	Bell Ville	8500	3262S	6268W	10 1938	7 1980	M
36	Piedra Blanca	Piedra Blanca	340	3293S	6470W	9 1977	8 1980	D
37	Cuarto	Tincunaco	1450	3292S	6450W	7 1961	8 1980	M
38	Parana (Brazo Principal)	Isla Pati		2948S	5958W	9 1975	8 1980	M
39	Parana (Brazo Secundario)	Isla Pati		2948S	5955W	9 1975	8 1980	M
40	Corrientes	Paso Lucero	13877	2897S	5855W	8 1968	12 1977	M
41	Rio Bento Gomes	Pocone	2660	1631S	5650W	1 1978	12 1978	D
42	Rio Cuiaba	Porto Alegre		1763S	5696W	1 1978	12 1978	D
43	Paraguai	Fecho Dos Morros	470000	2142S	5788W	12 1965	12 1978	M
44	Pescado	Puesto Romero	1700	2280S	6448W	9 1956	2 1980	M
45	Iruya	Anta Muerta	2950	2290S	6455W	1 1956	9 1979	M
46	Bermejo	Aguas Blancas	4450	2272S	6437W	9 1977	8 1982	D
46	Bermejo	Aguas Blancas	4450	2272S	6437W	9 1944	8 1980	M
47	Grande de Tarija	Algarrobito (1971: San Telmo)	10460	2258S	6423W	9 1964	8 1980	M
48	Bermejo	Zanja del Tigre	249312	2310S	6422W	9 1940	8 1980	M
49	Mojotoro	el Angosto	850	2473S	6527W	9 1979	8 1982	D
50	Grande	San Juancito	8440	2435S	6500W	9 1967	8 1980	M
51	Lavayen	Bajada de Pinto	4100	2443S	6483W	9 1942	8 1980	M
52	San Francisco	Caimancito (Puente Carretero)	25800	2373S	6447W	10 1946	2 1980	M
53	Del Valle	el Ceibal	995	2473S	6432W	9 1966	8 1980	M
54	Dorado	el Sombrero (1.9.81: Barrialito)	85	2458S	6422W	9 1978	8 1982	D
55	Pilcomayo	la Paz	96000	2245S	6237W	9 1960	8 1980	M
56	Bermejo	el Colorado	65736	2630S	5938W	9 1968	8 1977	M
57	Paraguay	Asuncion		2527S	5767W	1 1965	12 1972	M
58	Pilcomayo	Villa Montes	81506	2125S	6347W	1 1976	12 1979	M
59	Mirinay	Paso Ledesma	10056	2983S	5768W	8 1968	12 1979	M
60	Uruguay	Concordia	249312	3140S	5802W	1 1968	12 1979	M

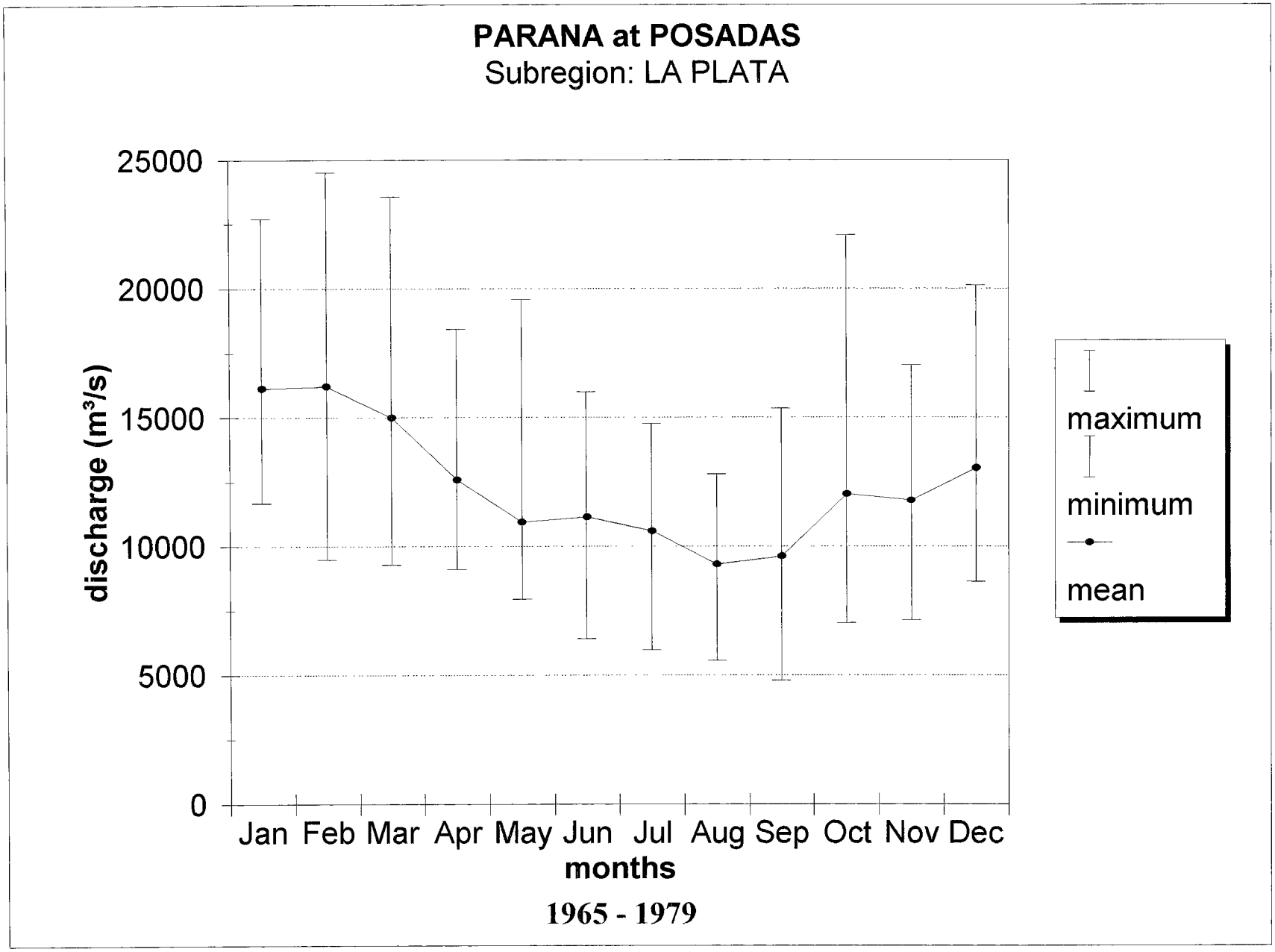
GLOBAL RUNOFF DATA CENTRE (GRDC)
20 LARGEST RIVERS

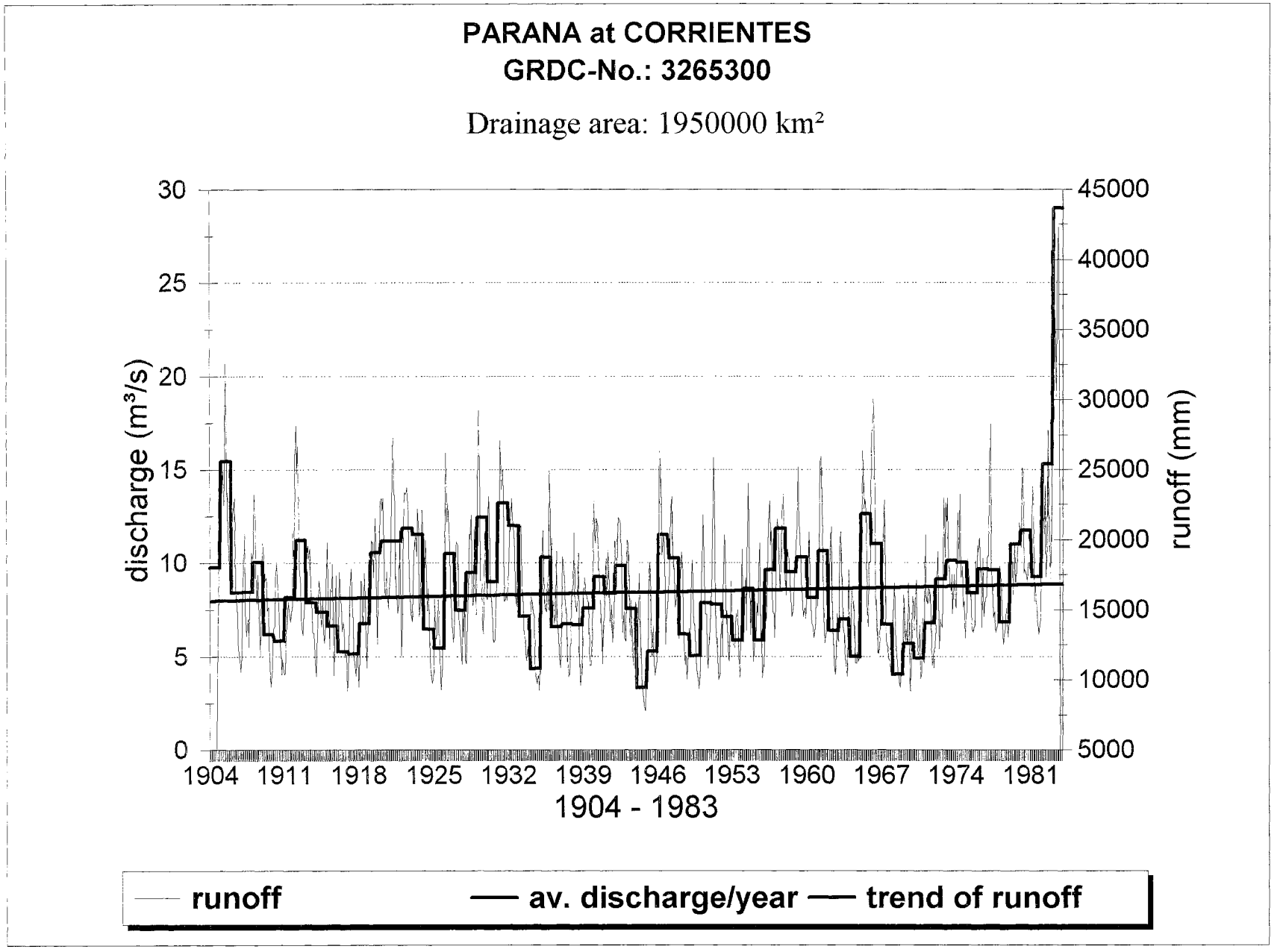
	RIO DE LA PLATA							table 3
No.	River	Station	Area (km²)	Latitude	Longitude	first rec.	last rec.	day/month
61	Uruguay	Salto	244000	3138S	5793W	1 1965	12 1979	M
62	Negro	Palmar	63000	3312S	5718W	1 1910	12 1979	M
63	Yi	Paso del Bote	12668	3322S	5690W	1 1978	11 1987	D
64	Tacuarembo	Paso de la Laguna	14038	3223S	5540W	1 1978	12 1988	D
65	Caraguata	Paso de las Toscas	1097	3213S	5500W	1 1978	12 1988	D
66	Negro	Paso Pereira	11773	3242S	5520W	1 1978	12 1988	D
66	Negro	Paso Pereira	11773	3242S	5520W	1 1980	12 1984	M
	Embalse en Rio Negro	Rincon del Bonete				1 1947	9 1977	D
	Embalse en Rio Negro	San Gregorio				10 1946	12 1990	D
67	Rio Pelotas	Passo Socorro	8423	2836S	5080W	2 1978	12 1979	D
68	Rio Chapeco	Passo Nova Erechim	7535	2690S	5285W	1 1978	12 1980	D
69	Rio Irani	Bonito	630	2695S	5216W	1 1978	12 1980	D
70	Rio Ijui	Ponte Mistica	9426	2818S	5475W	1 1978	12 1980	D
71	Rio Ibirapuita	Alegrete	5945	2978S	5578W	1 1978	12 1980	D

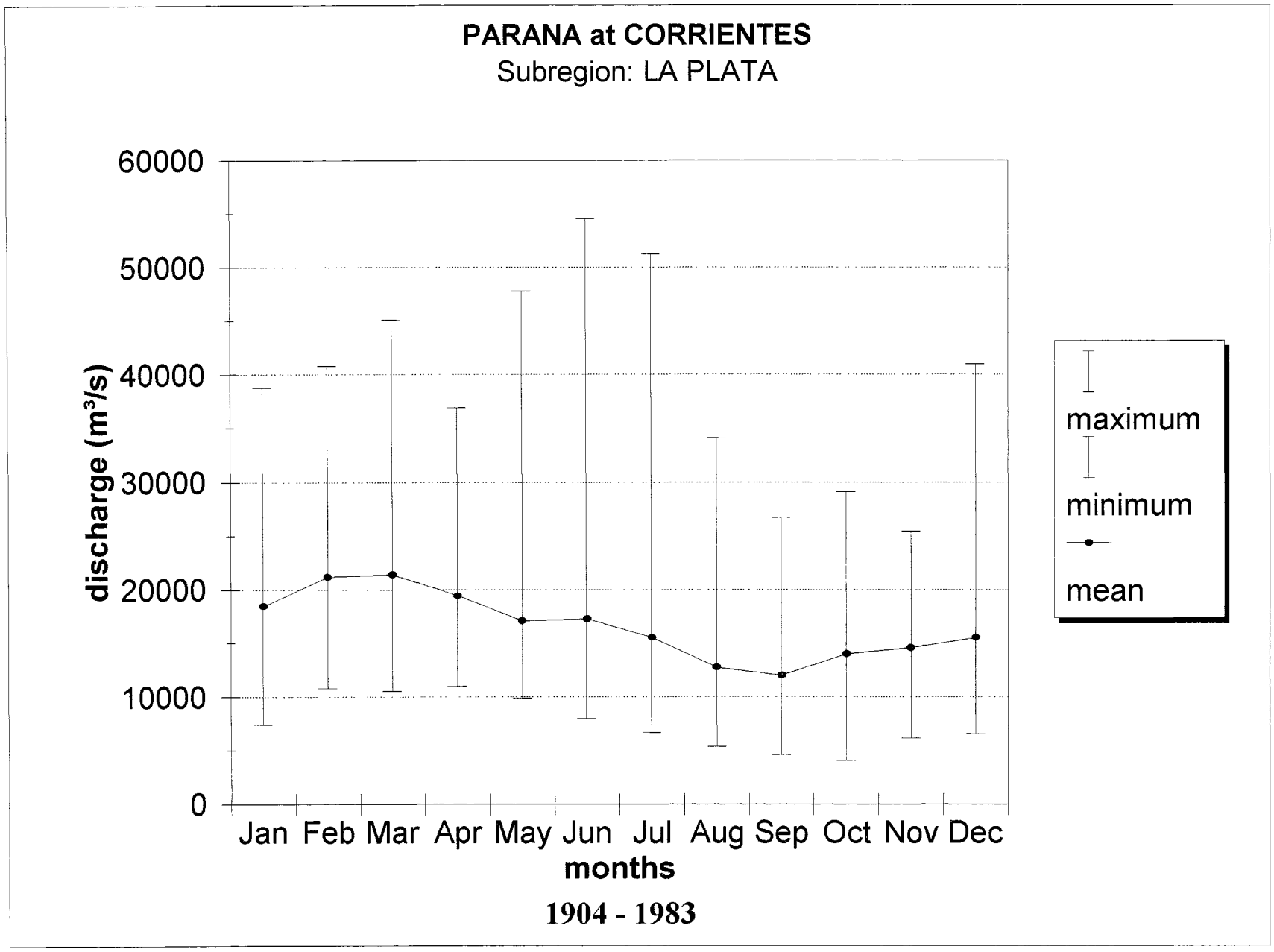

PARANA at GUAIRA
GRDC-No.: 3663100
Drainage area: 802200 km²
discharge (m³/s)
runoff (mm)
30
25
20
15
10
5
0
14000
12000
10000
8000
6000
4000
1920
1927
1934
1941
1948
1955
1962
1969
1976
1920 - 1979
runoff
av. discharge/year
trend of runoff

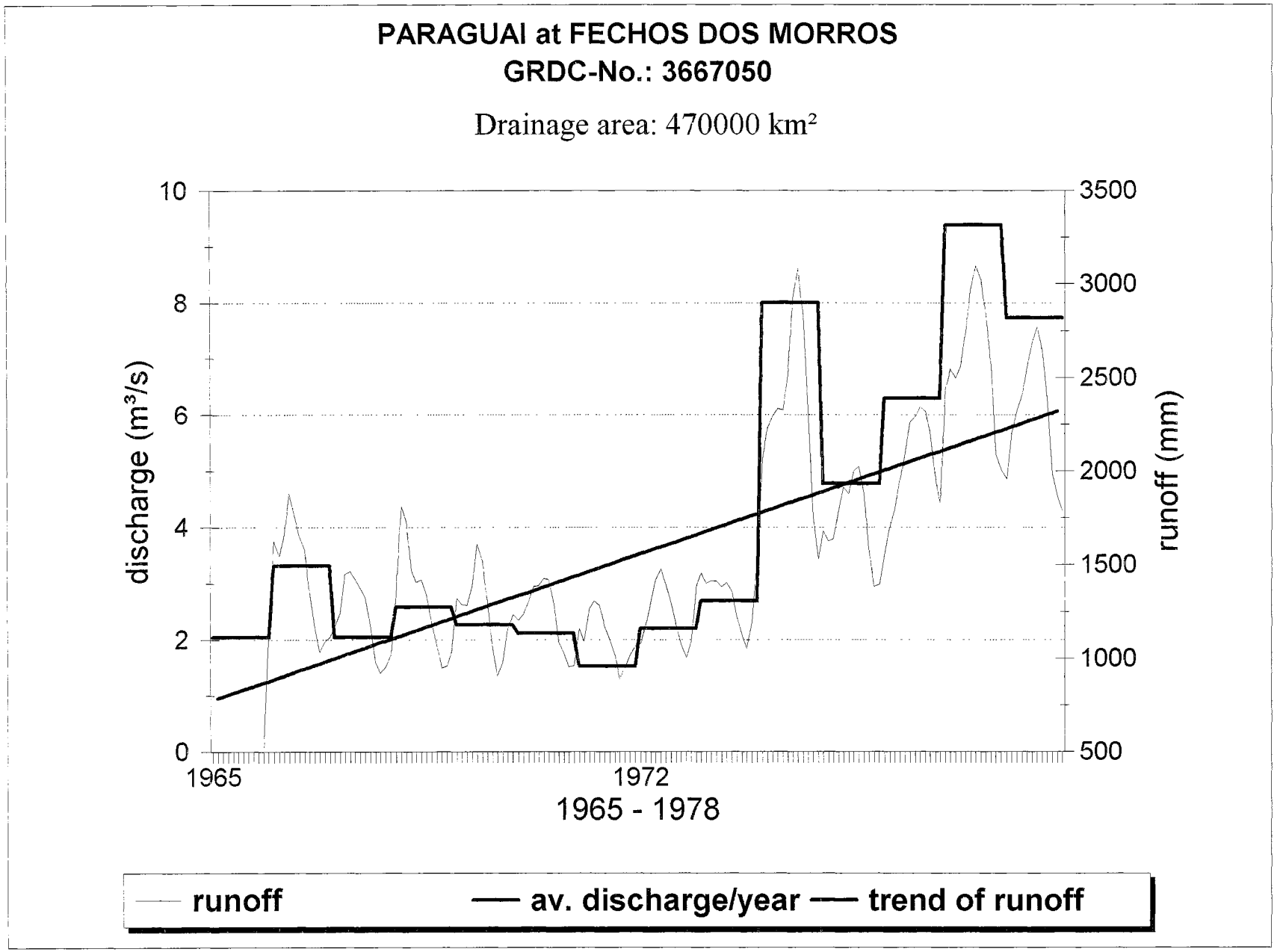

PARANA at GUAIRA
Subregion: LA PLATA
25000
20000
15000
10000
5000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
maximum
minimum
mean
1920 - 1979

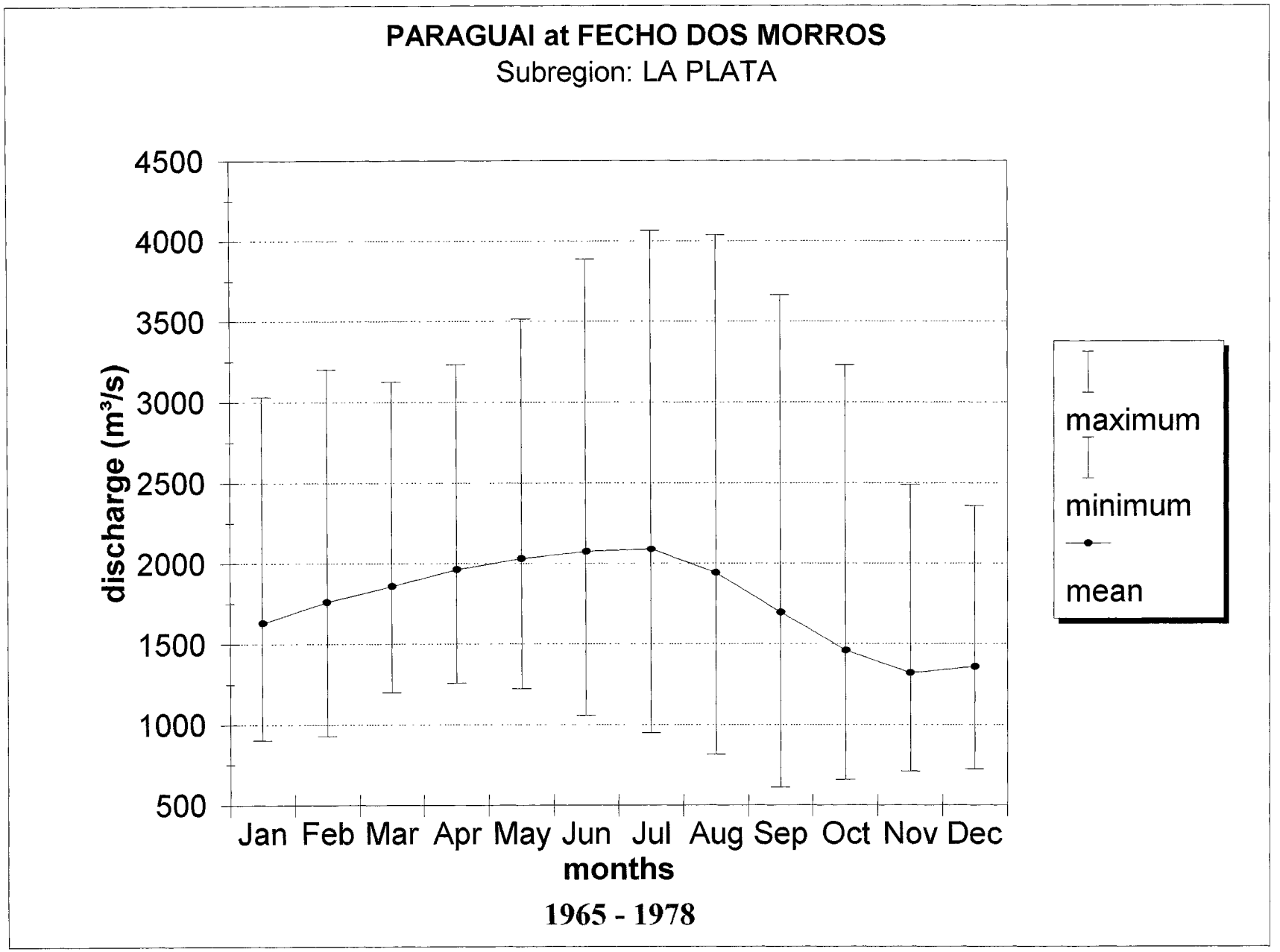

PARANA at POSADAS
GRDC-No.: 3264500
Drainage area: 975000 km²
discharge (m³/s)
runoff (mm)
30
25
20
15
10
5
0
18000
16000
14000
12000
10000
8000
1965
1972
1979
1965 - 1979
runoff
av. discharge/year
trend of runoff

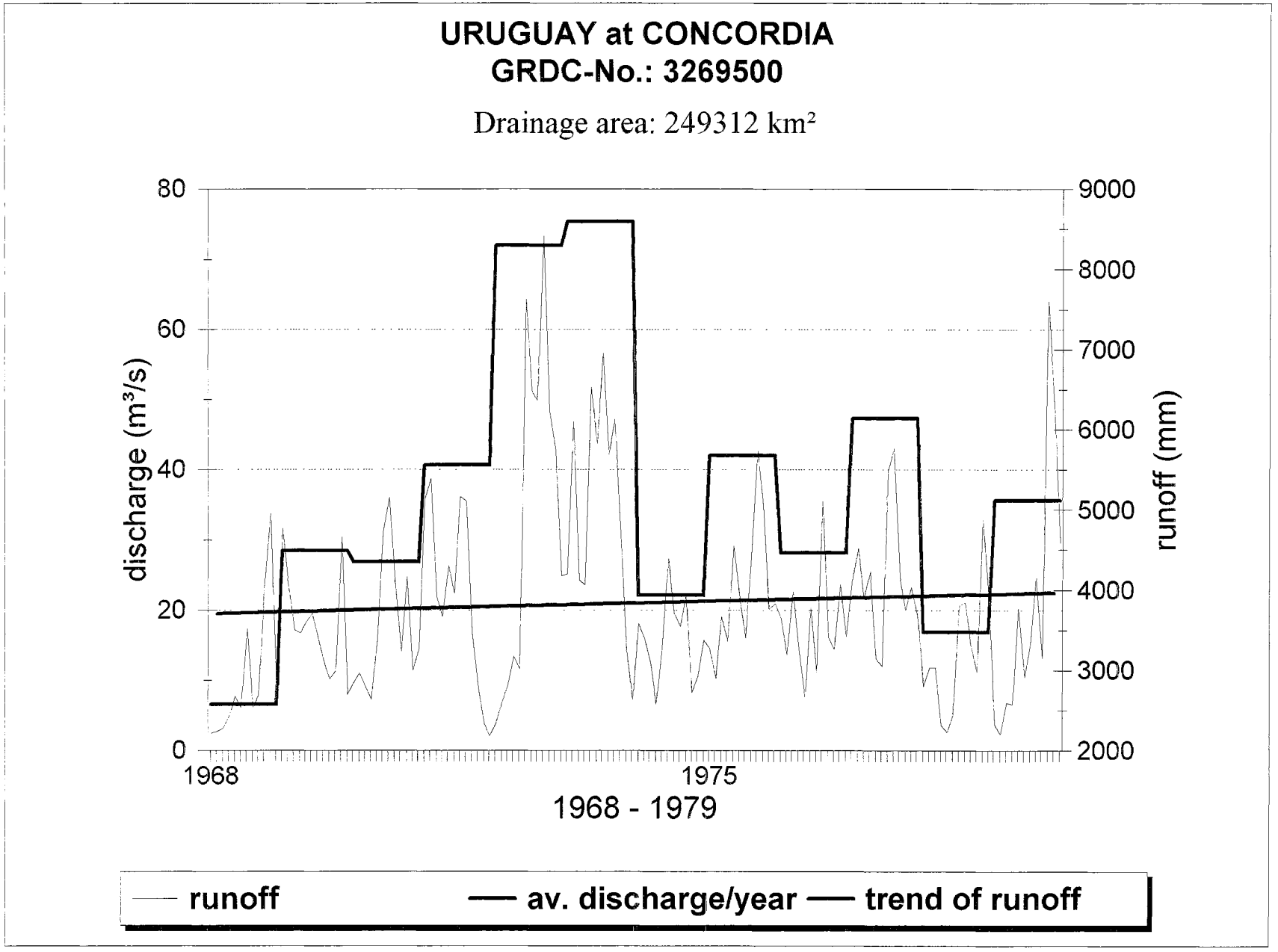

PARANA at POSADAS
Subregion: LA PLATA
25000
20000
15000
10000
5000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1965 - 1979
maximum
minimum
mean

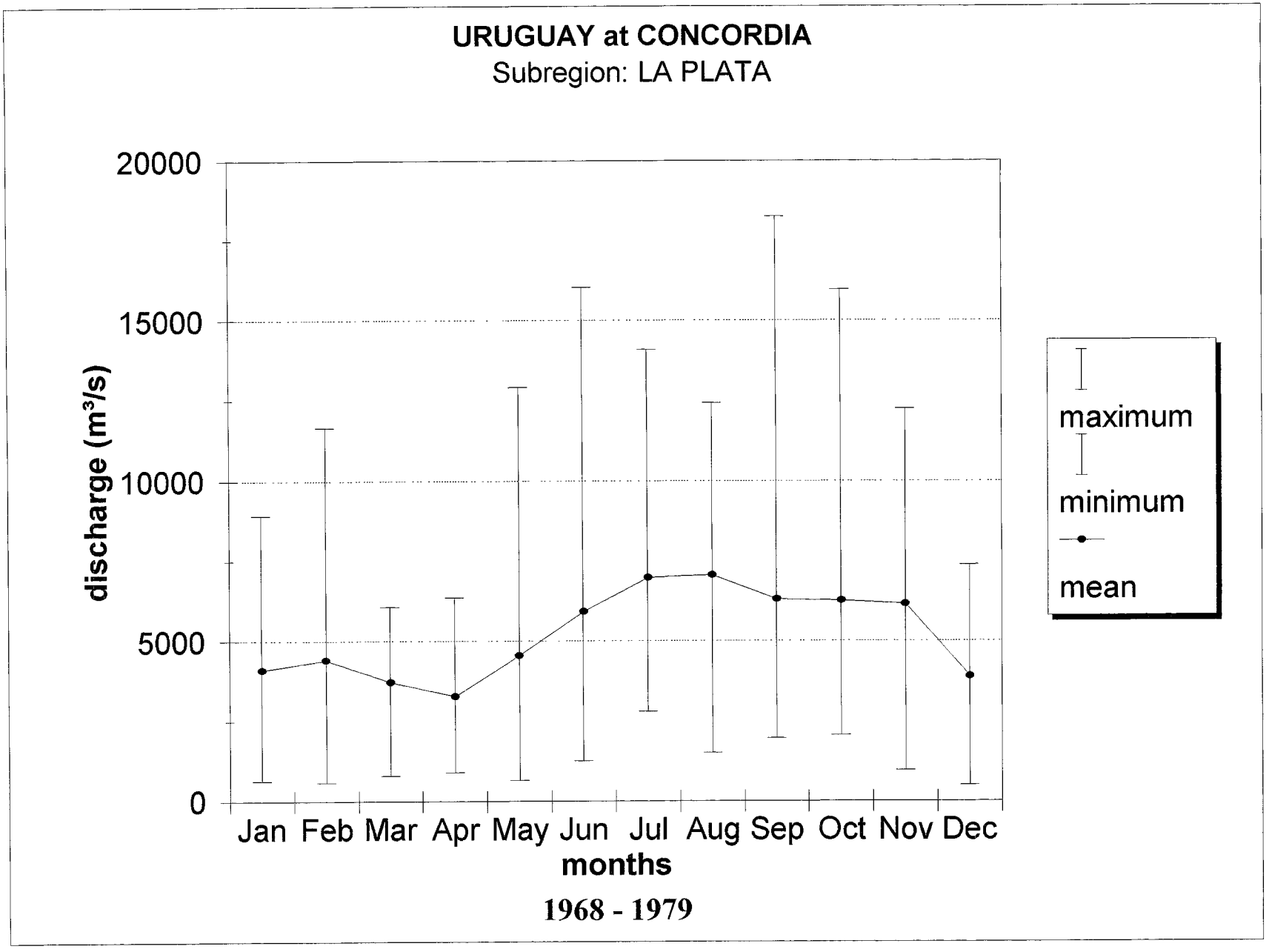

PARANA at CORRIENTES
GRDC-No.: 3265300
Drainage area: 1950000 km²
discharge (m³/s)
runoff (mm)
0
5
10
15
20
25
30
5000
10000
15000
20000
25000
30000
35000
40000
45000
1904 1911 1918 1925 1932 1939 1946 1953 1960 1967 1974 1981
1904 - 1983
runoff
av. discharge/year
trend of runoff

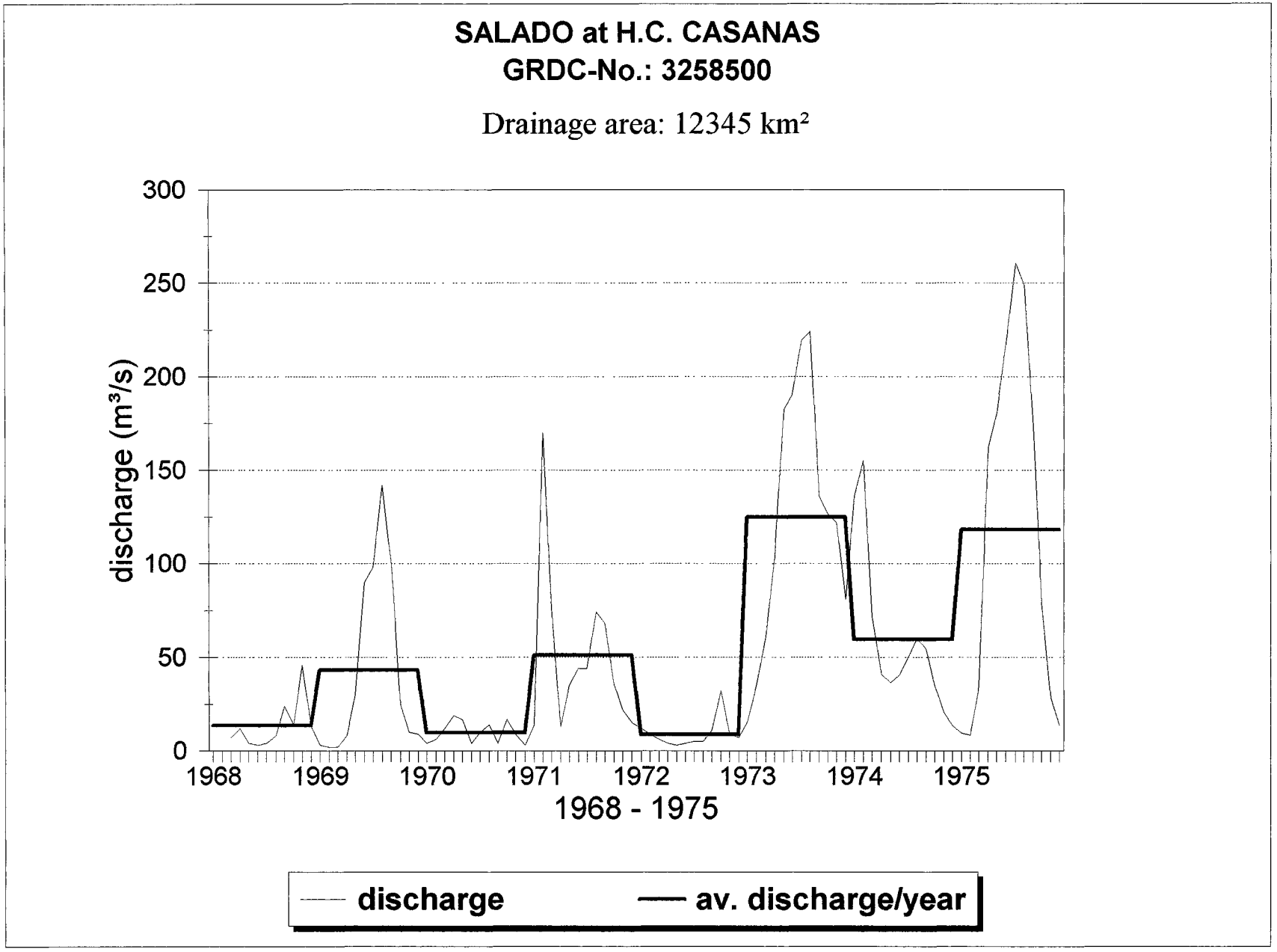

PARANA at CORRIENTES
Subregion: LA PLATA
60000
50000
40000
30000
20000
10000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
maximum
minimum
mean
1904 - 1983

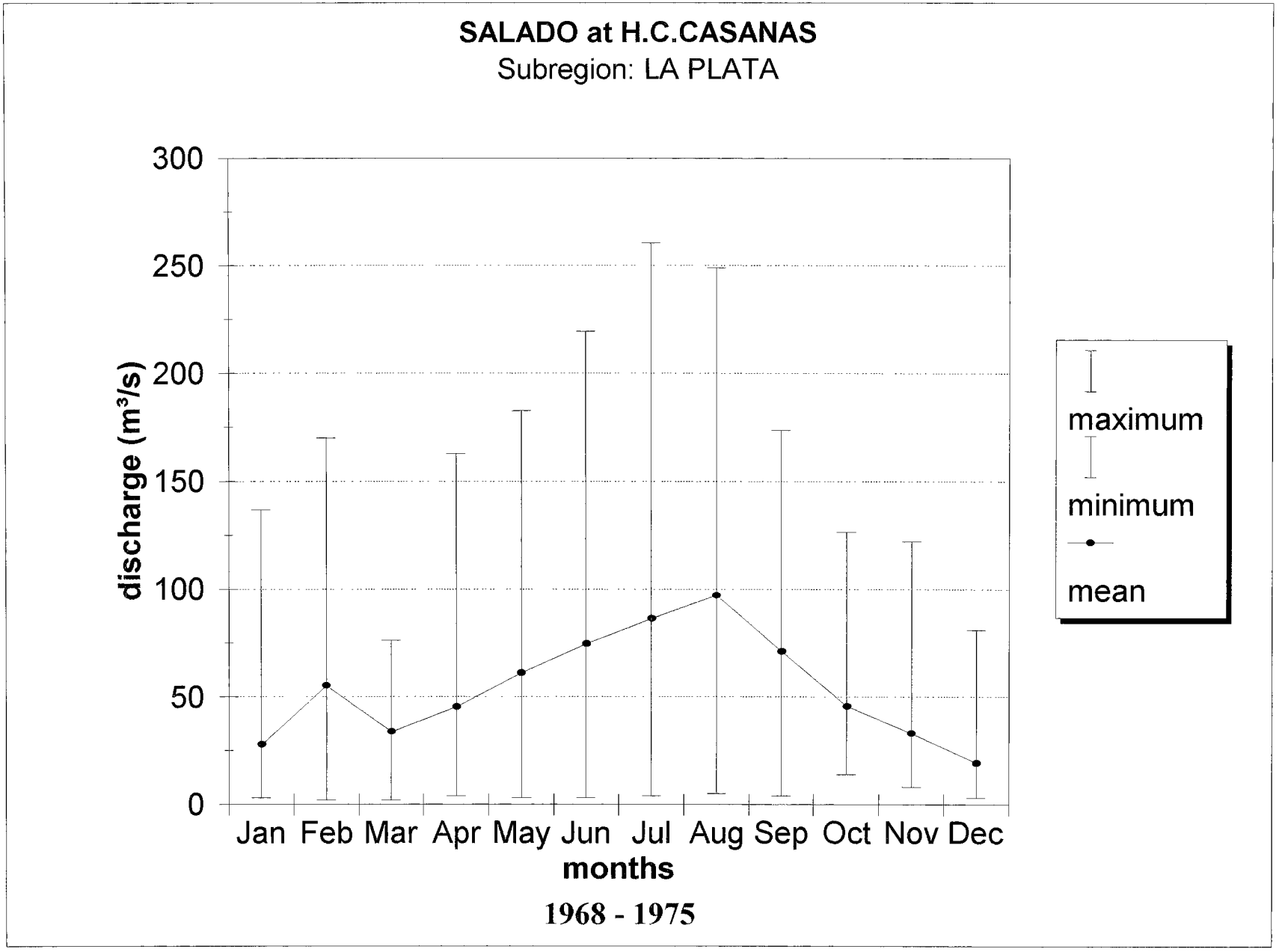

PARAGUAI at FECHOS DOS MORROS
GRDC-No.: 3667050
Drainage area: 470000 km²
discharge (m³/s)
runoff (mm)
10
8
6
4
2
0
3500
3000
2500
2000
1500
1000
500
1965
1972
1965 - 1978
runoff
av. discharge/year
trend of runoff

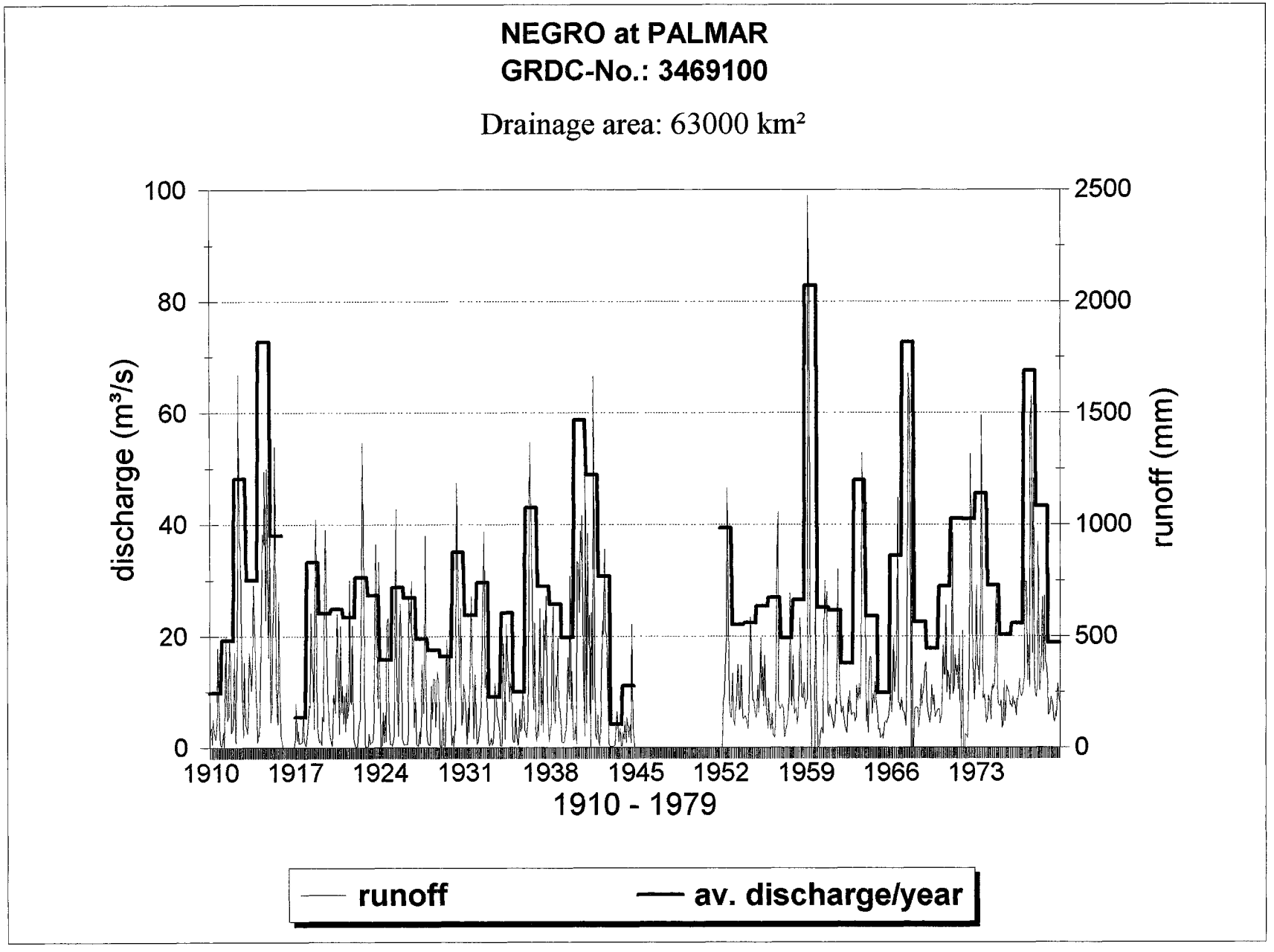

PARAGUAI at FECHO DOS MORROS
Subregion: LA PLATA
4500
4000
3500
3000
2500
2000
1500
1000
500
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
maximum
minimum
mean
1965 - 1978

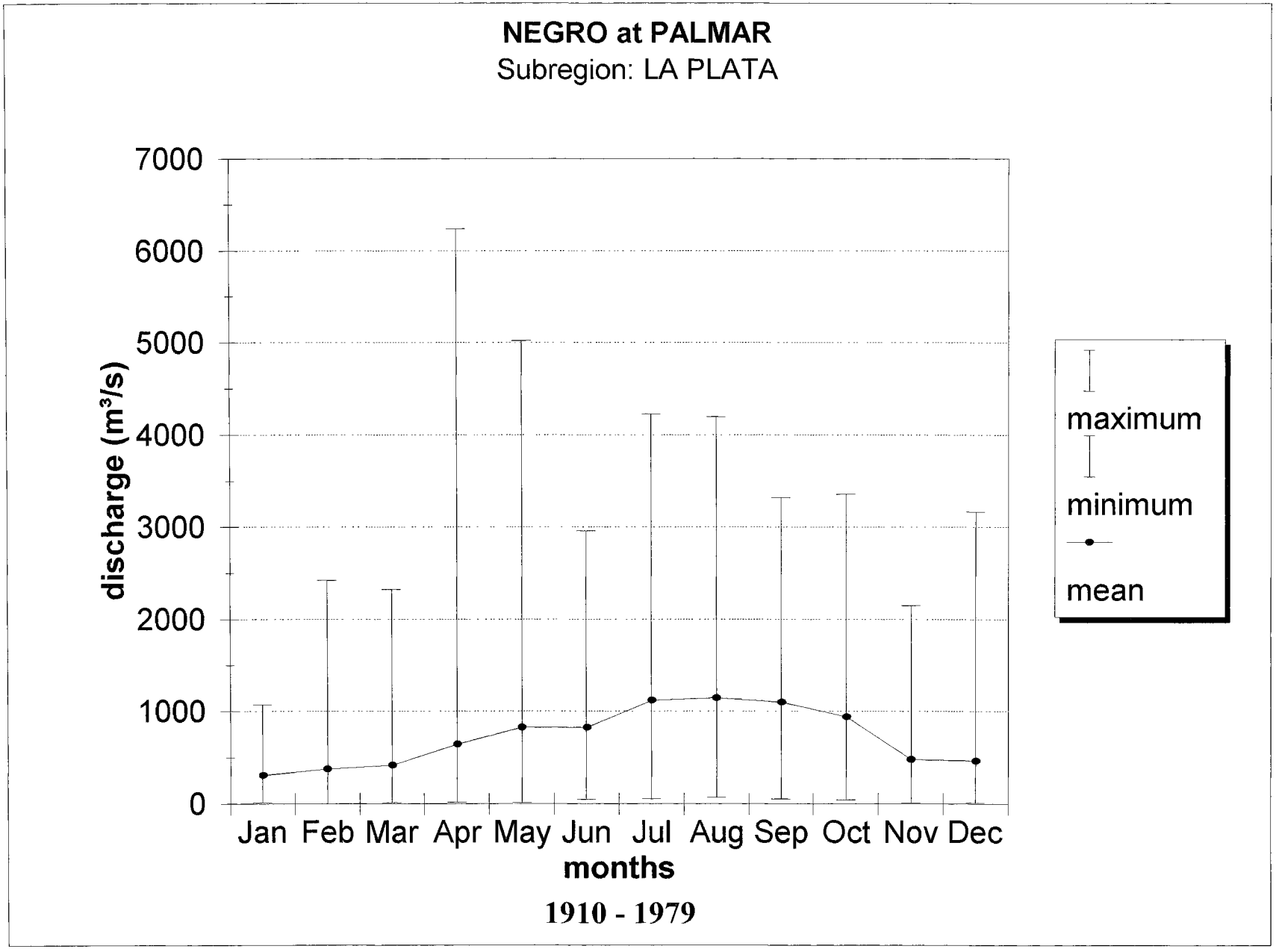

URUGUAY at CONCORDIA
GRDC-No.: 3269500
Drainage area: 249312 km²
discharge (m³/s)
runoff (mm)
0
20
40
60
80
2000
3000
4000
5000
6000
7000
8000
9000
1968
1975
1968 - 1979
runoff
av. discharge/year
trend of runoff

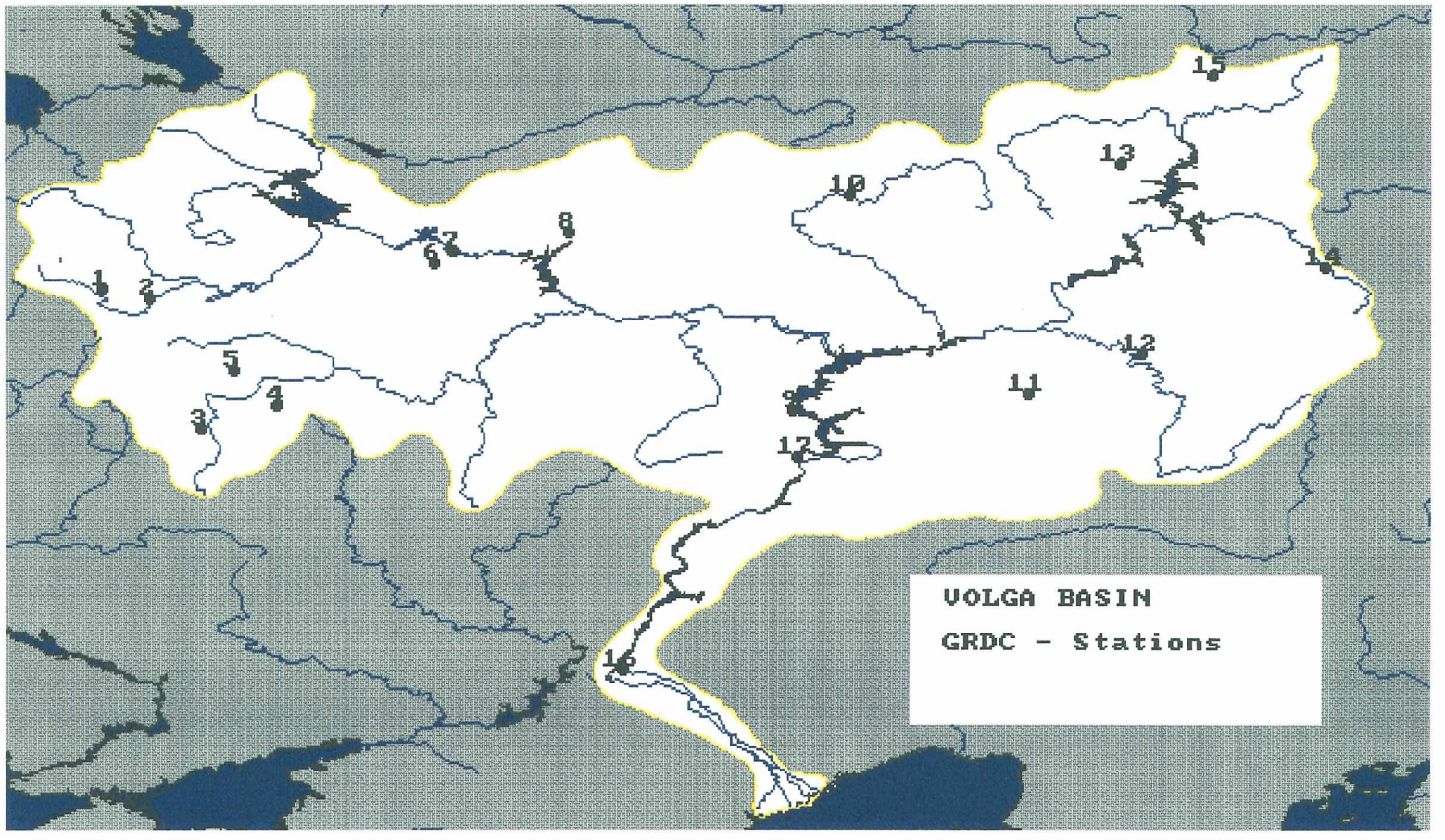

URUGUAY at CONCORDIA
Subregion: LA PLATA
20000
15000
10000
5000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1968 - 1979
maximum
minimum
mean


SALADO at H.C. CASANAS
GRDC-No.: 3258500
Drainage area: 12345 km²
discharge (m³/s)
300
250
200
150
100
50
0
1968
1969
1970
1971
1972
1973
1974
1975
1968 - 1975
discharge
av. discharge/year


SALADO at H.C.CASANAS
Subregion: LA PLATA
300
250
200
150
100
50
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
maximum
minimum
mean
1968 - 1975

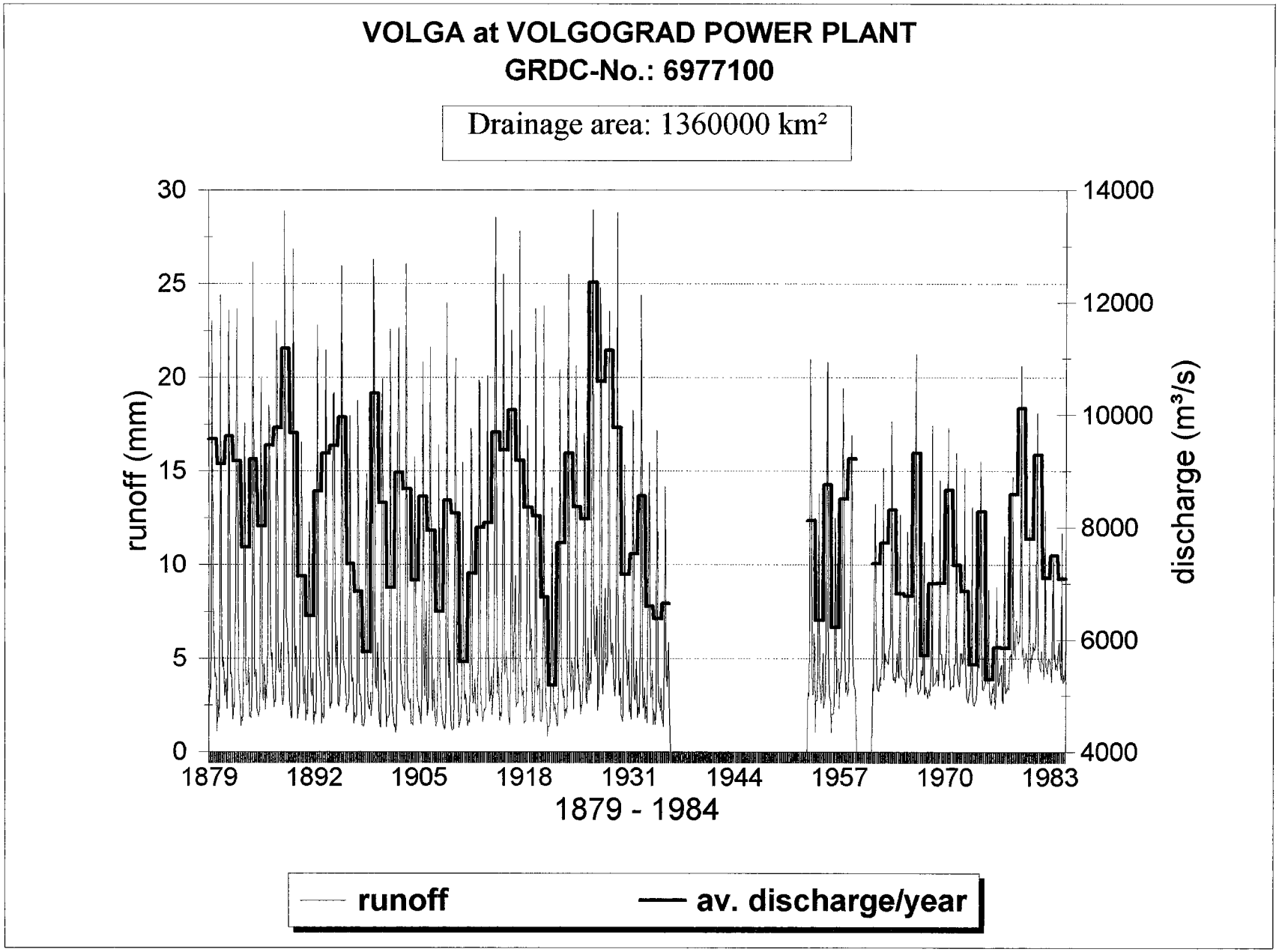

NEGRO at PALMAR
GRDC-No.: 3469100
Drainage area: 63000 km²
discharge (m³/s)
runoff (mm)
100
80
60
40
20
0
2500
2000
1500
1000
500
0
1910
1917
1924
1931
1938
1945
1952
1959
1966
1973
1910 - 1979
runoff
av. discharge/year

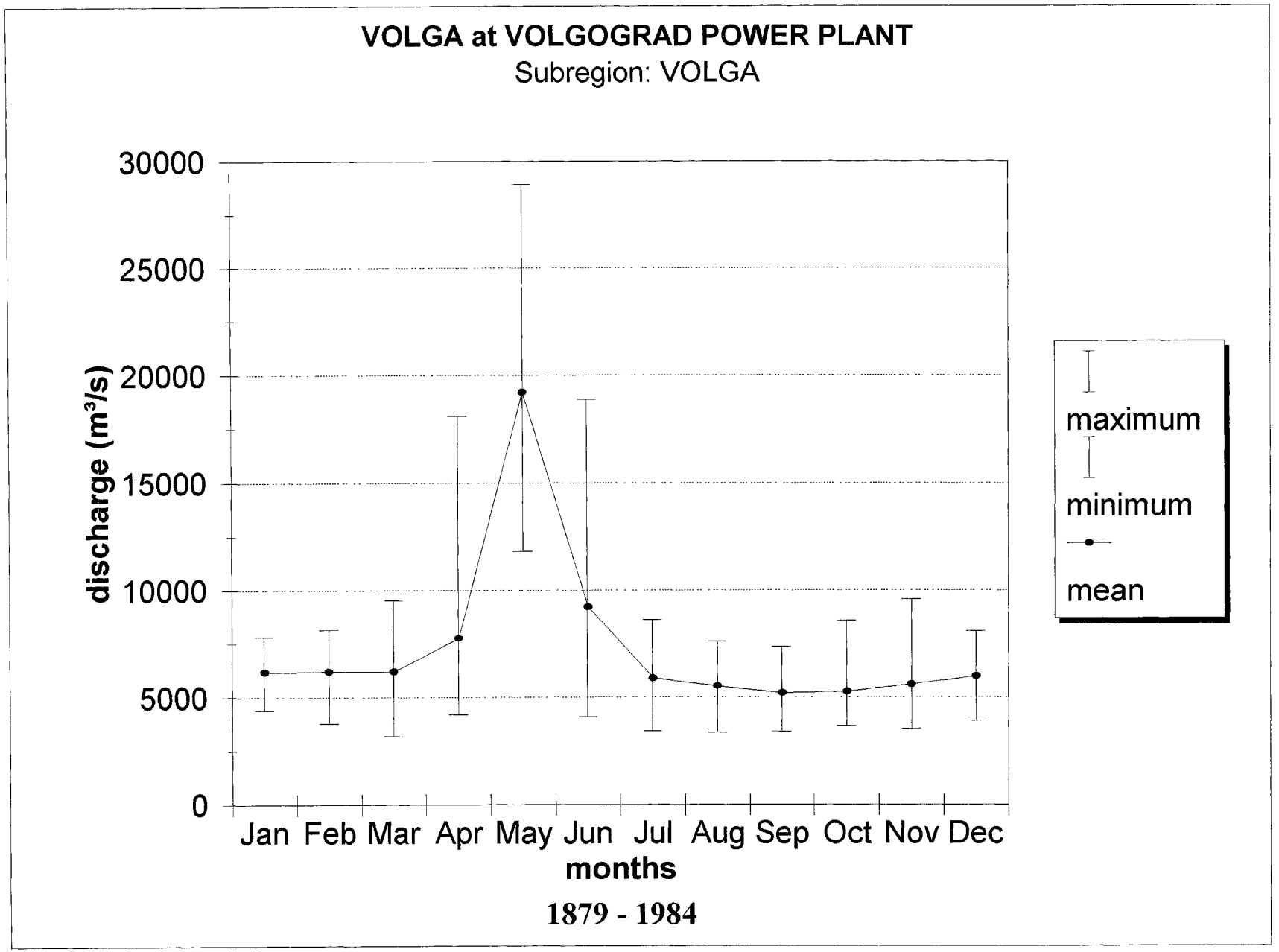

NEGRO at PALMAR
Subregion: LA PLATA
7000
6000
5000
4000
3000
2000
1000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1910 - 1979
maximum
minimum
mean

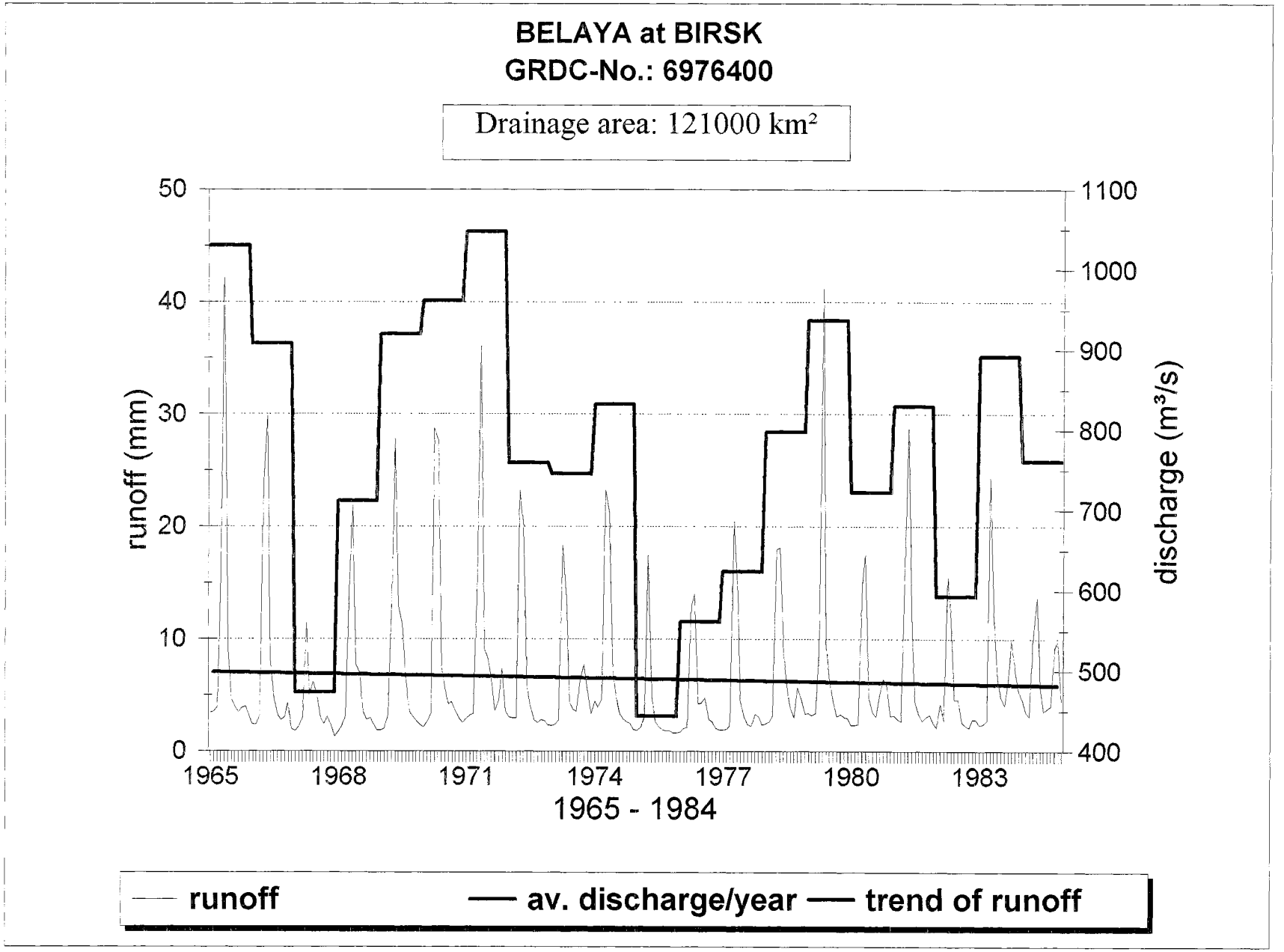

VOLGA BASIN
GRDC - Stations

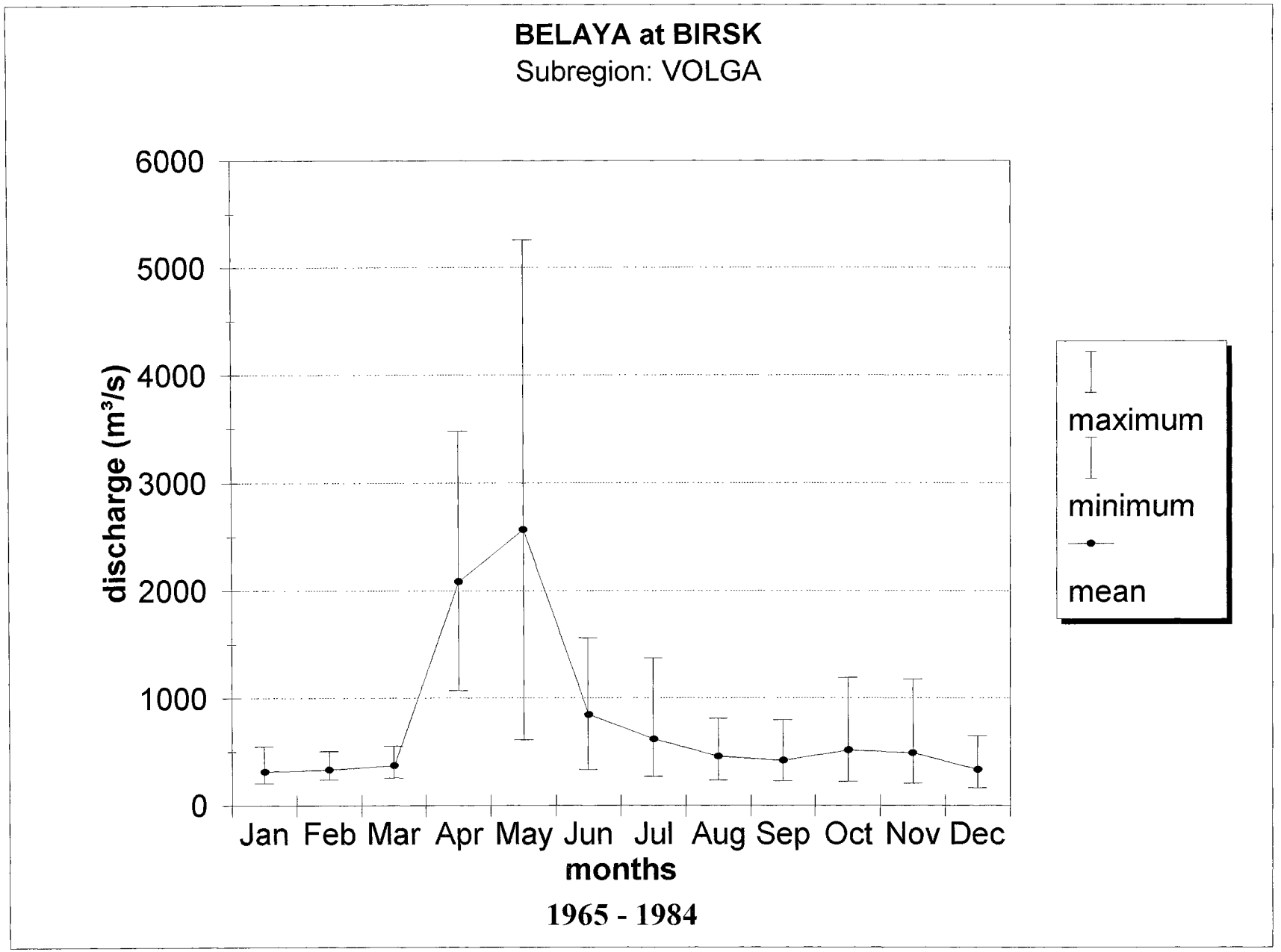
GLOBAL RUNOFF DATA CENTRE (GRDC)
20 LARGEST RIVERS

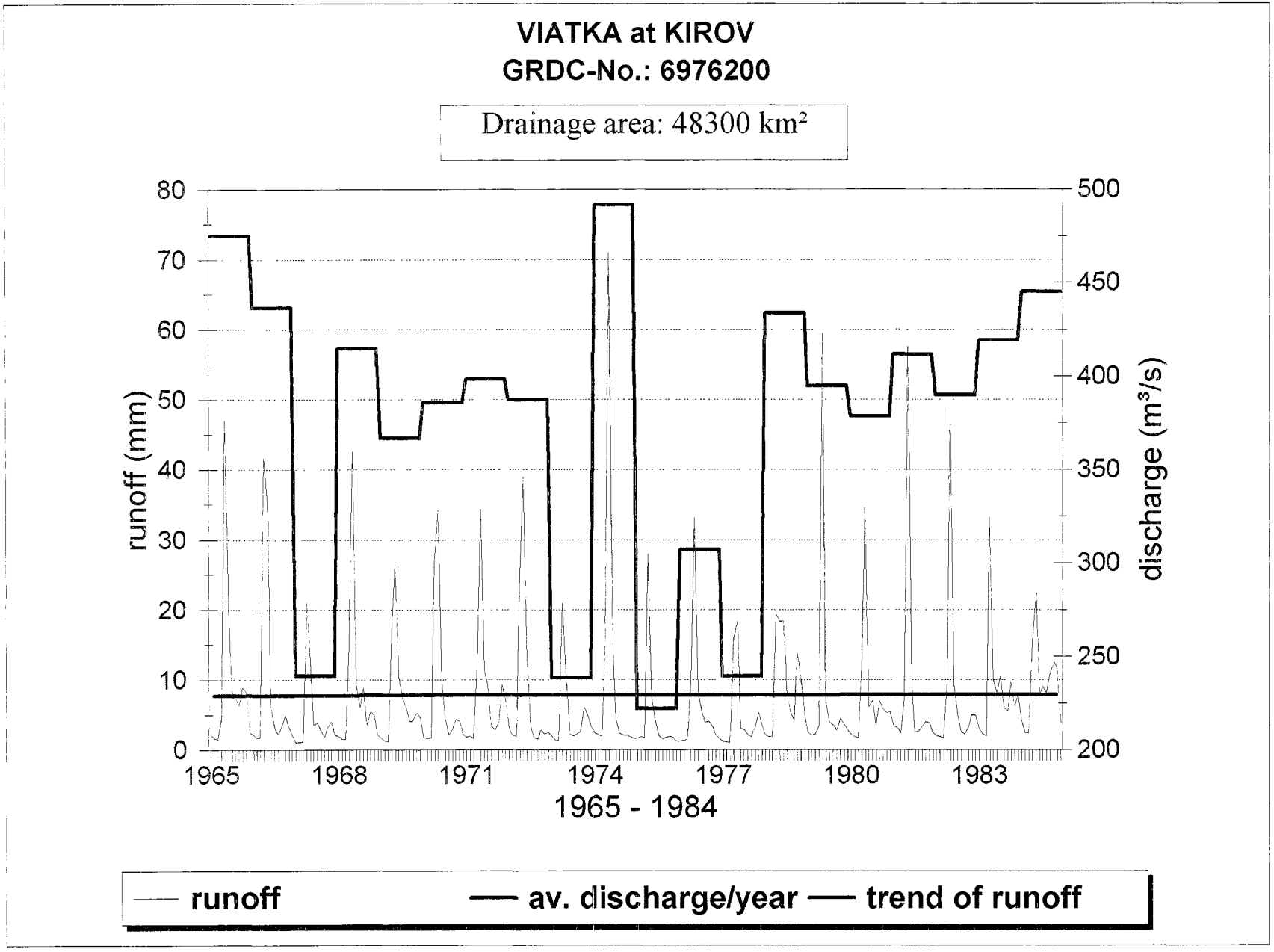
	VOLGA							
No.	**River**	**Station**	**Area (km²)**	**Latitude**	**Longitude**	**first rec.**	**last rec.**	**day/month**
1	Volga	Eltsy	9130	5671N	3398E	1 1978	12 1987	D
2	Volga	Staritsa	21100	5650N	3493E	1 1891	12 1985	M
3	Oka	Kostomarovo	4900	5308N	3603E	1 1978	12 1987	D
3	Oka	Kostomarovo	4900	5308N	3603E	1 1965	12 1984	M
4	Moskva	Barsuki	755	5425N	3753E	1 1978	12 1987	D
5	Protva	Spas-Zagorie	3640	5503N	3664E	1 1978	12 1987	D
5	Protva	Spas-Zagorie	3640	5503N	3664E	1 1965	12 1984	M
6	Solonitsa	Bortnikovo	739	5729N	4083E	1 1978	12 1983	D
7	Shosha	Klopovo-Gorodishche	339	5746N	4123E	1 1978	12 1980	D
8	Unzha	Makariev	18500	5790N	4367E	1 1965	12 1984	M
9	Sviaga	Vyrypaevka	3600	5413N	4831E	1 1978	12 1987	D
10	Viatka	Kirov	48300	5865N	4955E	1 1965	12 1984	M
11	Dymka	Tatarskaya Dymskaya	520	5450N	5320E	1 1978	12 1987	D
12	Belaya	Birsk	121000	5535N	5555E	1 1965	12 1984	M
13	Velva	Oshib	836	5933N	5516E	1 1978	12 1987	D
14	Chusovaya	Staroutkinsk	5450	5721N	5946E	1 1978	12 1987	D
15	Kolva	Petretsova	2830	6123N	5710E	1 1978	12 1987	D
	Seleuk	Nizhneitkulovo	141			1 1978	12 1987	D
16	**Volga**	**Volgograd Power Plant**	**1360000**	**4877N**	**4472E**	**1 1879**	**12 1984**	**M**
17	Krymza	Syzran	352	5316N	4848E	1 1978	12 1987	D

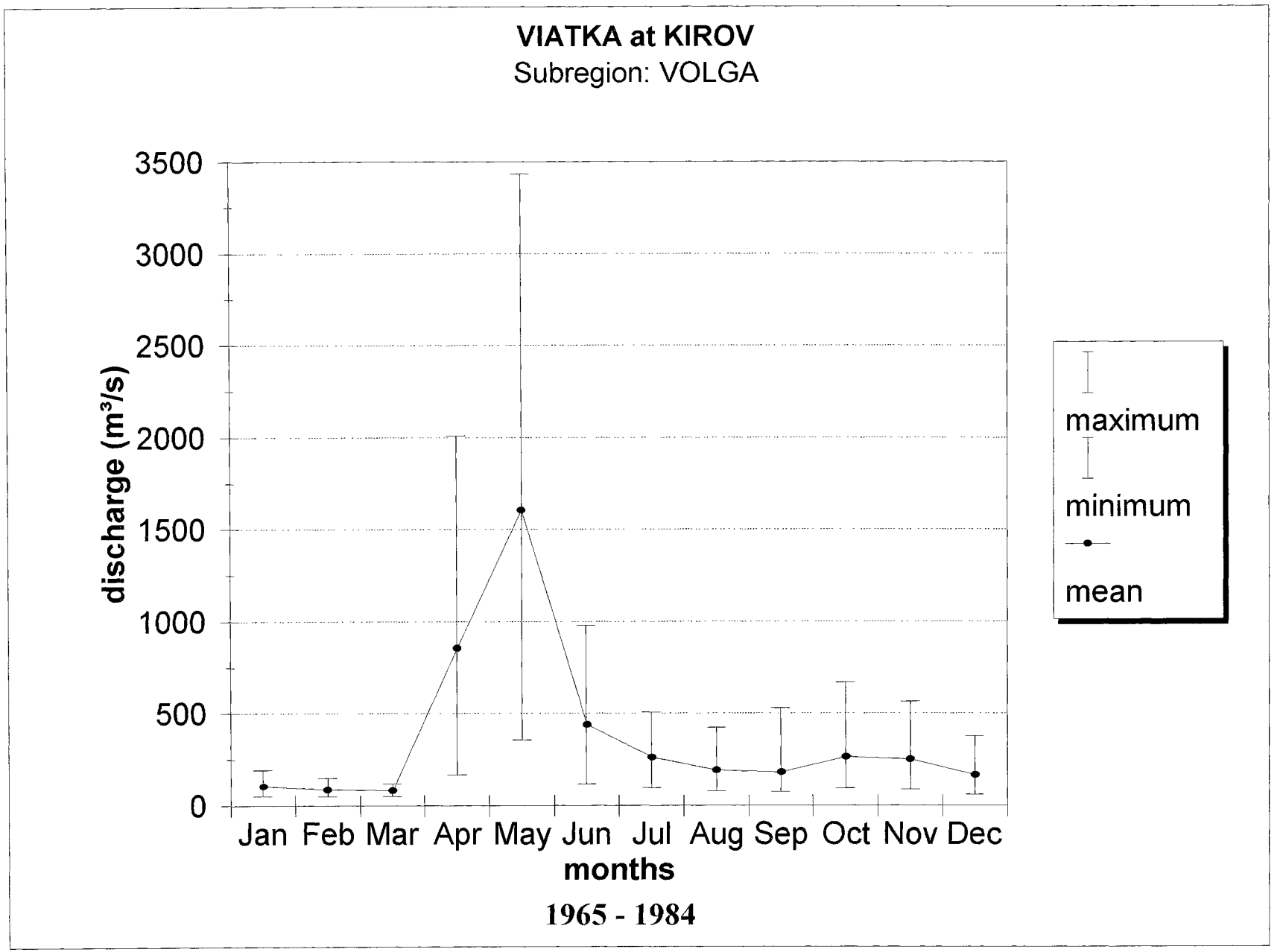

VOLGA at VOLGOGRAD POWER PLANT
GRDC-No.: 6977100
Drainage area: 1360000 km²
runoff (mm)
discharge (m³/s)
30
25
20
15
10
5
0
14000
12000
10000
8000
6000
4000
1879
1892
1905
1918
1931
1944
1957
1970
1983
1879 - 1984
runoff
av. discharge/year

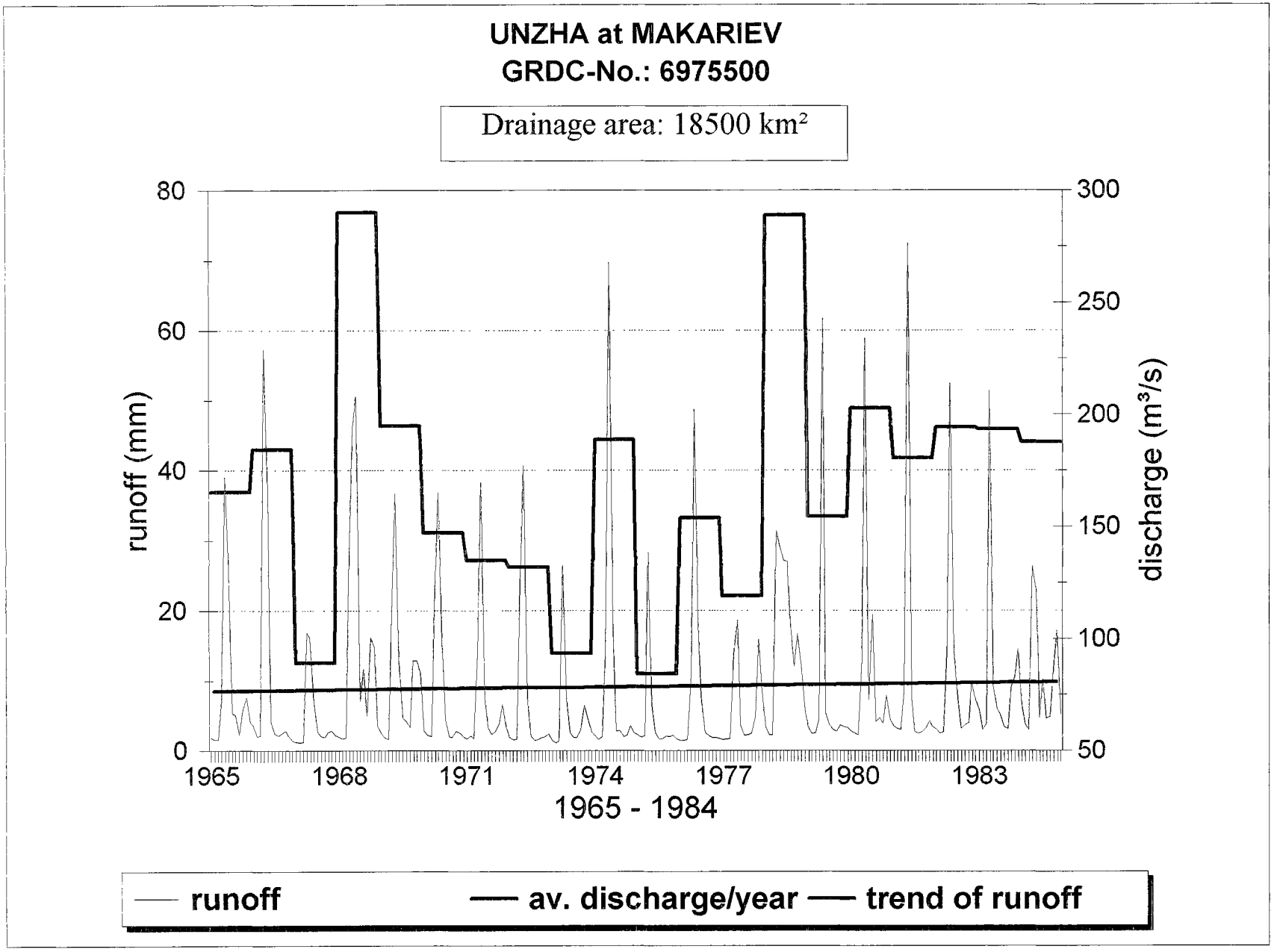

VOLGA at VOLGOGRAD POWER PLANT
Subregion: VOLGA
30000
25000
20000
15000
10000
5000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
maximum
minimum
mean
1879 - 1984

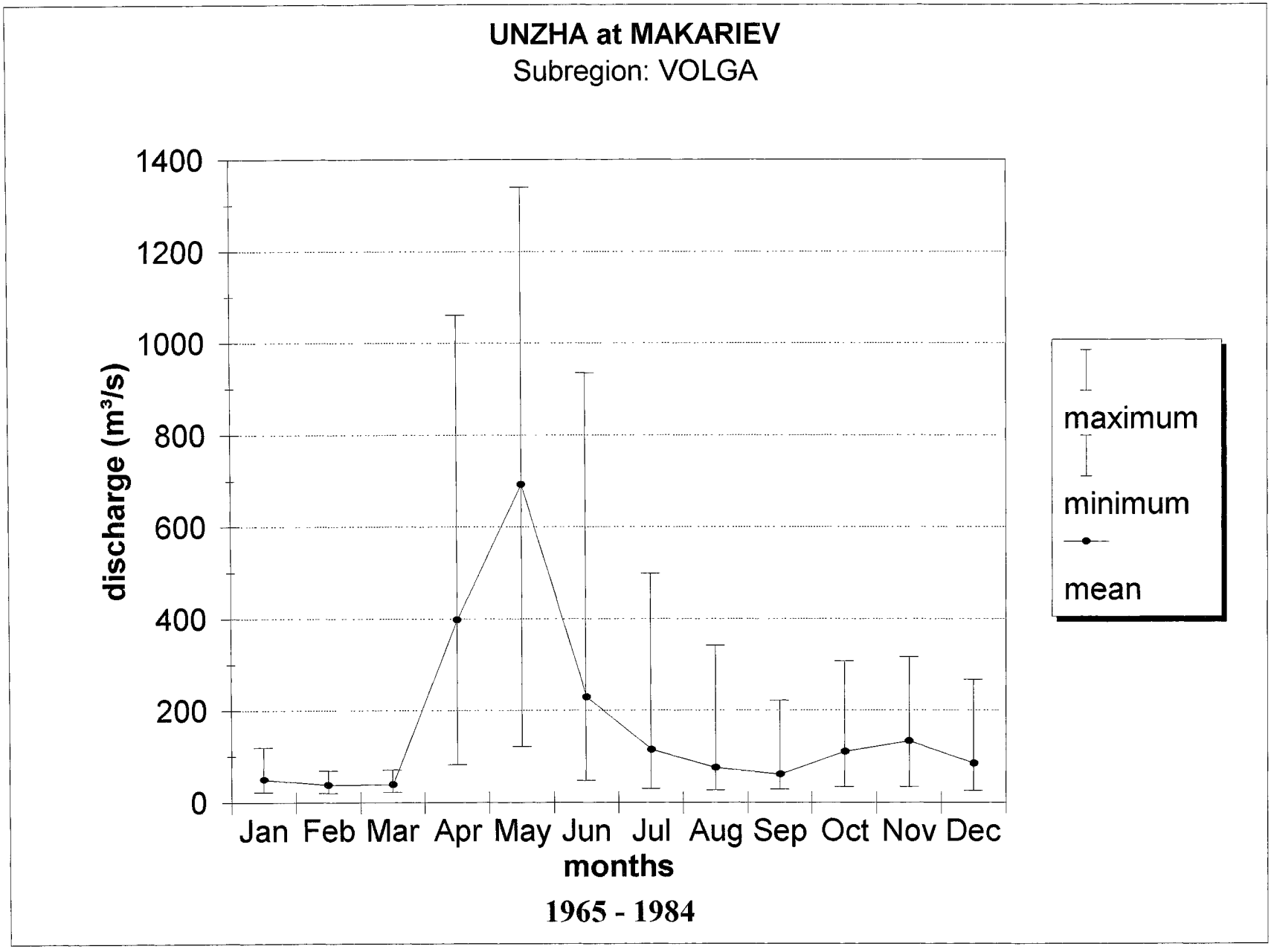

BELAYA at BIRSK
GRDC-No.: 6976400
Drainage area: 121000 km²
runoff (mm)
discharge (m³/s)
0
10
20
30
40
50
400
500
600
700
800
900
1000
1100
1965
1968
1971
1974
1977
1980
1983
1965 - 1984
runoff
av. discharge/year
trend of runoff

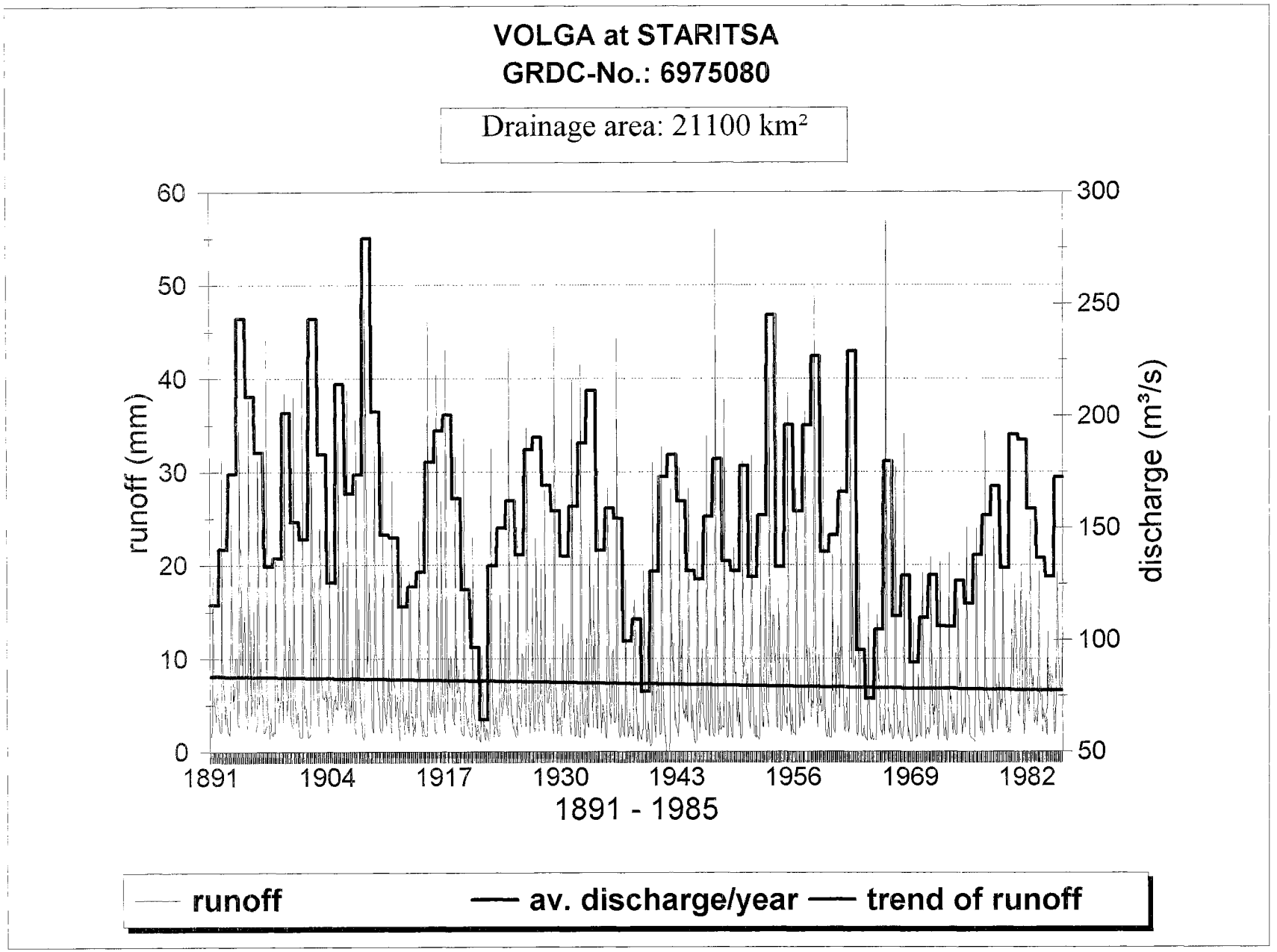

BELAYA at BIRSK
Subregion: VOLGA
6000
5000
4000
3000
2000
1000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1965 - 1984
maximum
minimum
mean

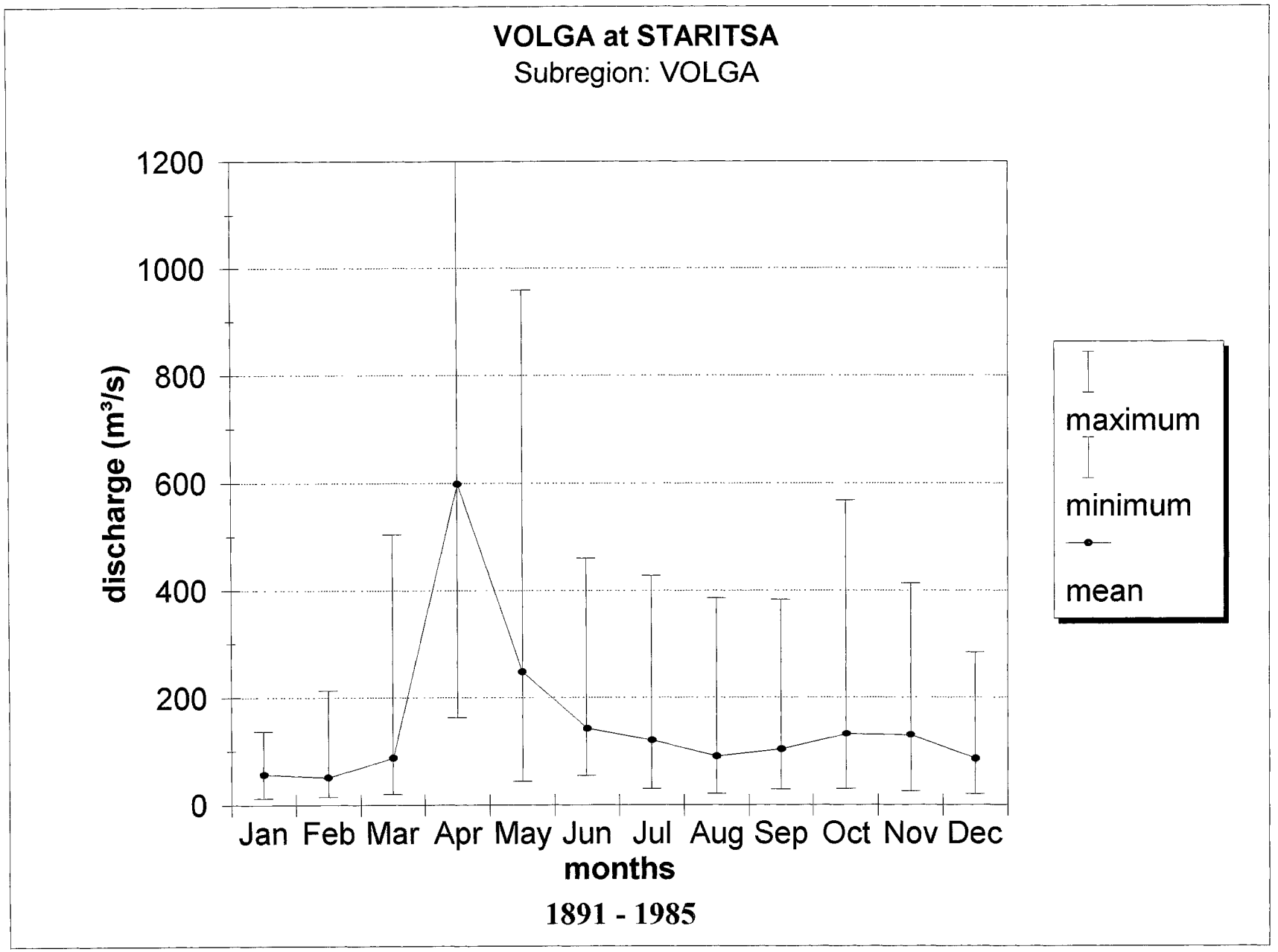

VIATKA at KIROV
GRDC-No.: 6976200
Drainage area: 48300 km²
runoff (mm)
discharge (m³/s)
0
10
20
30
40
50
60
70
80
200
250
300
350
400
450
500
1965
1968
1971
1974
1977
1980
1983
1965 - 1984
runoff
av. discharge/year
trend of runoff


VIATKA at KIROV
Subregion: VOLGA
discharge (m³/s)
3500
3000
2500
2000
1500
1000
500
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1965 - 1984
maximum
minimum
mean


UNZHA at MAKARIEV
GRDC-No.: 6975500
Drainage area: 18500 km²
runoff (mm)
discharge (m³/s)
0
20
40
60
80
50
100
150
200
250
300
1965
1968
1971
1974
1977
1980
1983
1965 - 1984
runoff
av. discharge/year
trend of runoff


UNZHA at MAKARIEV
Subregion: VOLGA
1400
1200
1000
800
600
400
200
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1965 - 1984
maximum
minimum
mean

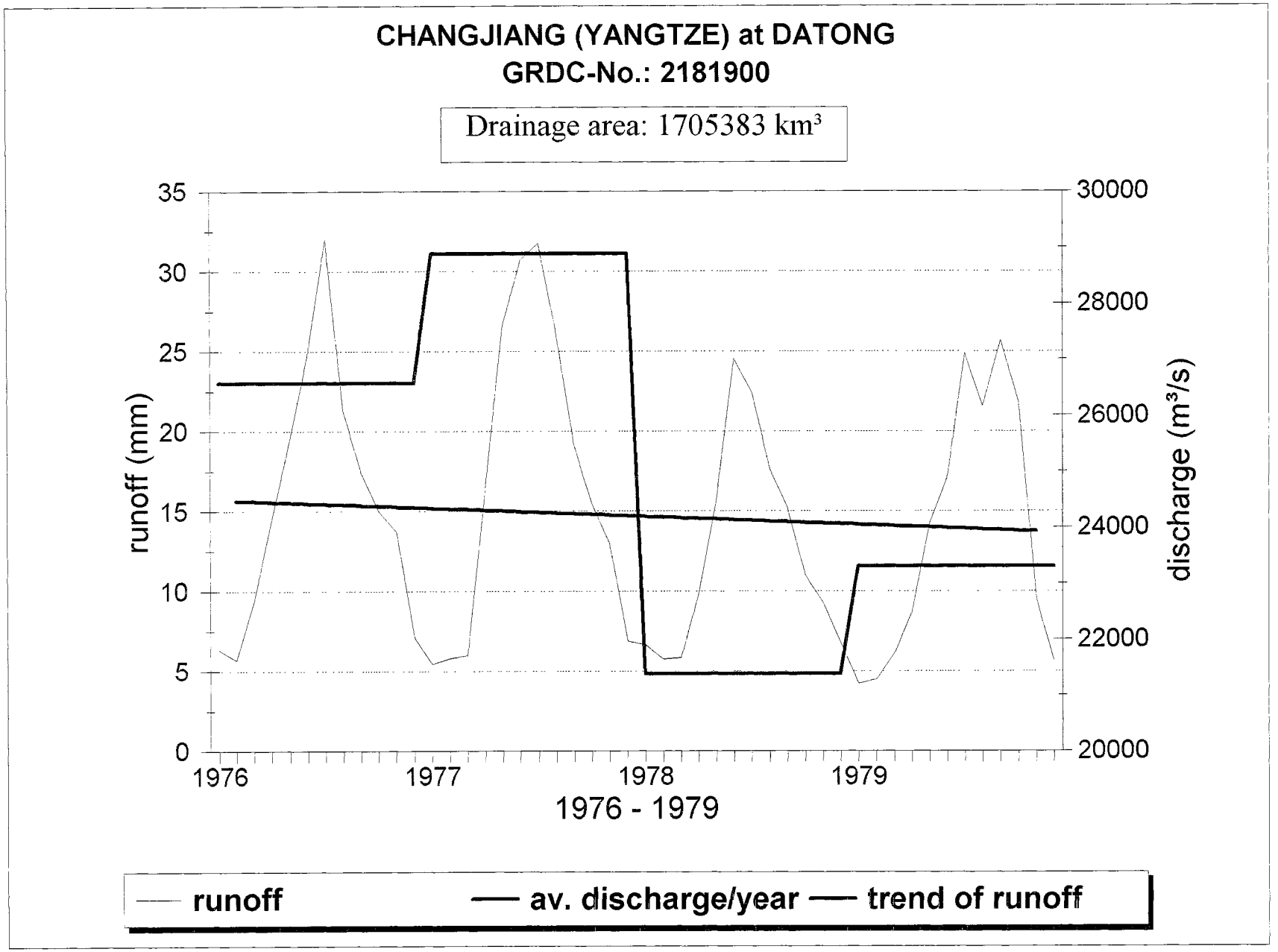

VOLGA at STARITSA
GRDC-No.: 6975080
Drainage area: 21100 km²
runoff (mm)
discharge (m³/s)
60
50
40
30
20
10
0
300
250
200
150
100
50
1891
1904
1917
1930
1943
1956
1969
1982
1891 - 1985
runoff
av. discharge/year
trend of runoff

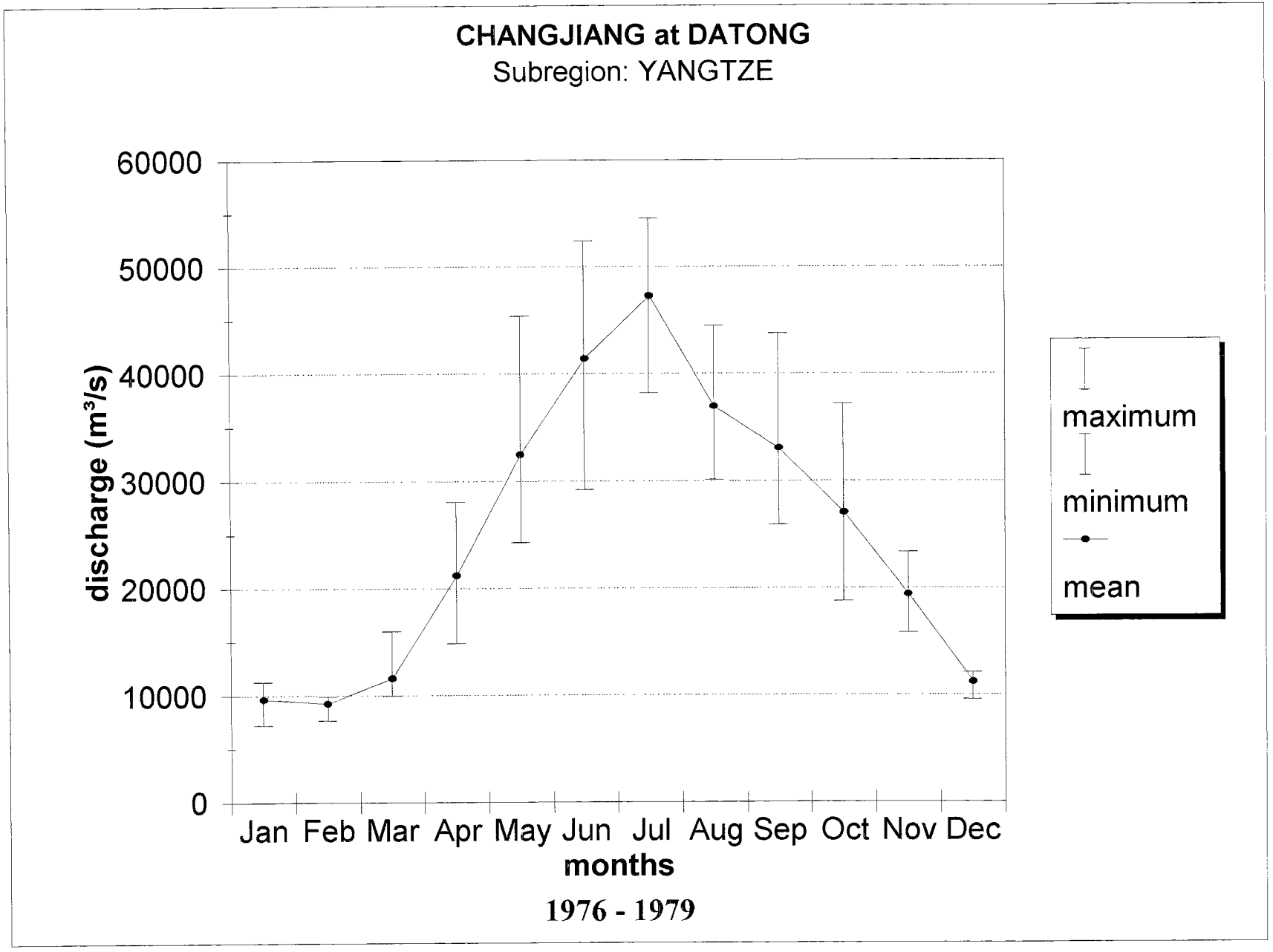

VOLGA at STARITSA
Subregion: VOLGA
1200
1000
800
600
400
200
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1891 - 1985
maximum
minimum
mean

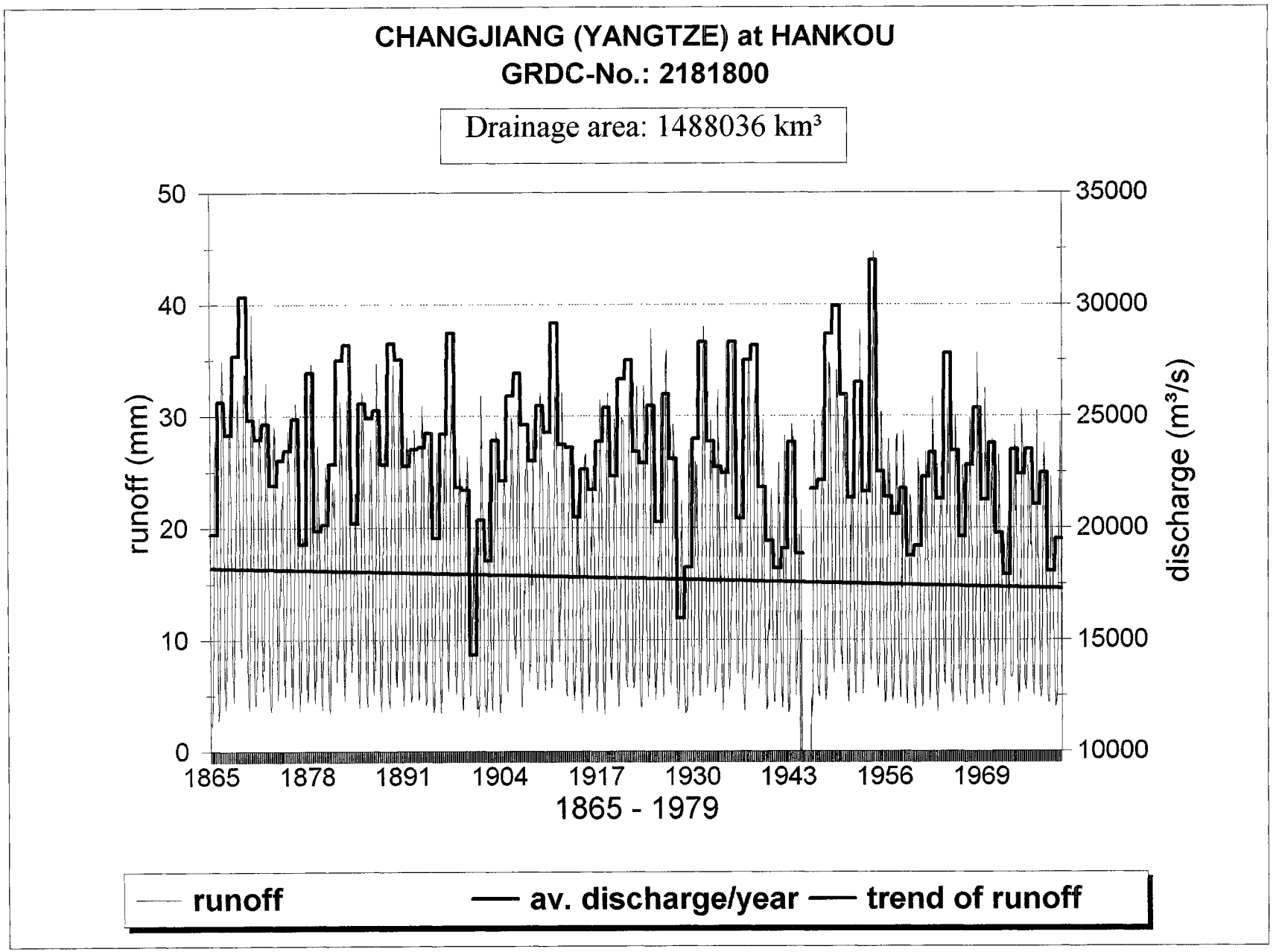
YANGTZE BASIN
GRDC - Stations
1
2
3
4
5
6
7

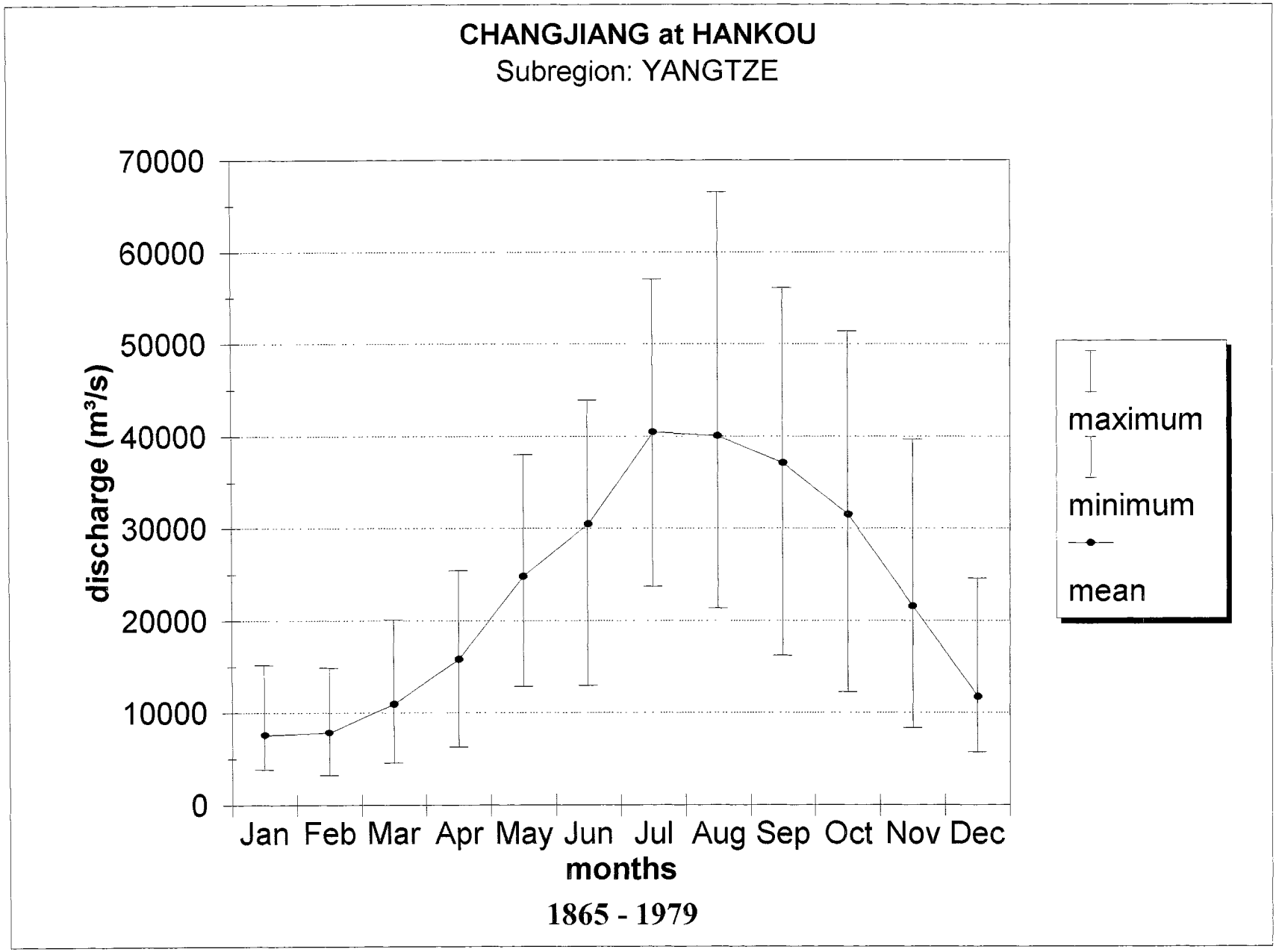
GLOBAL RUNOFF DATA CENTRE (GRDC)
20 LARGEST RIVERS

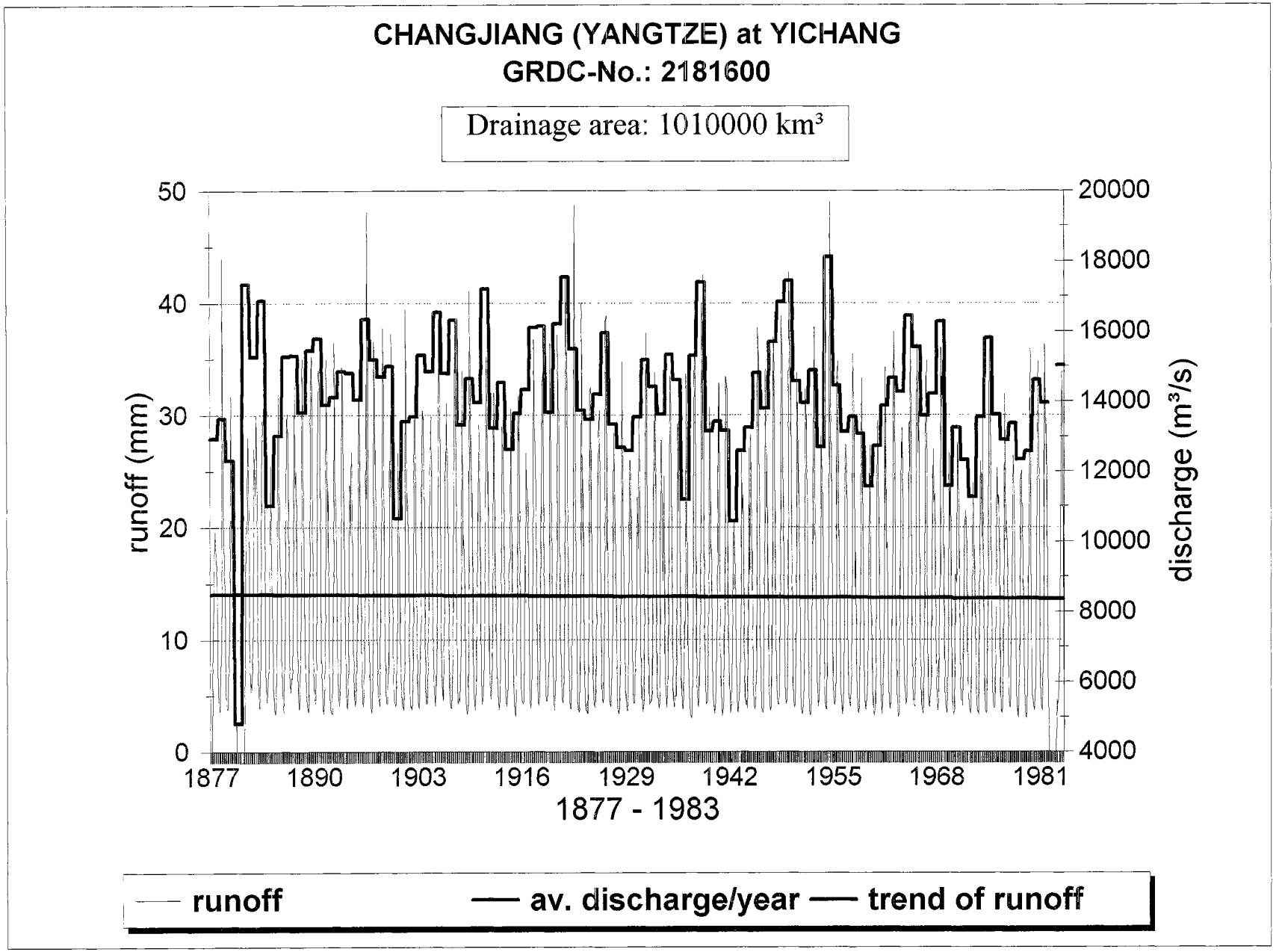
	YANGTZE							
No.	**River**	**Station**	**Area (km²)**	**Latitude**	**Longitude**	**first rec.**	**last rec.**	**day/month**
1	Wujiang	Gongtan	58300	2890N	10835E	1 1980	12 1982	M
2	Changjiang	Yichang	1010000	3066N	11123E	4 1877	12 1983	M
3	Changjiang	Hankou	1488036	3058N	11428E	1 1865	12 1979	M
4	Ganjiang	Jian	56200	2710N	11498E	1 1980	12 1982	M
5	**Changjiang**	**Datong**	**1705383**	**3077N**	**11762E**	**1 1976**	**12 1979**	**M**
6	Huaihe	Bengbu	121330	3293N	11738E	7 1915	12 1979	M
7	Hanjiang	Ankang	41400	3268N	10902E	1 1980	12 1982	M

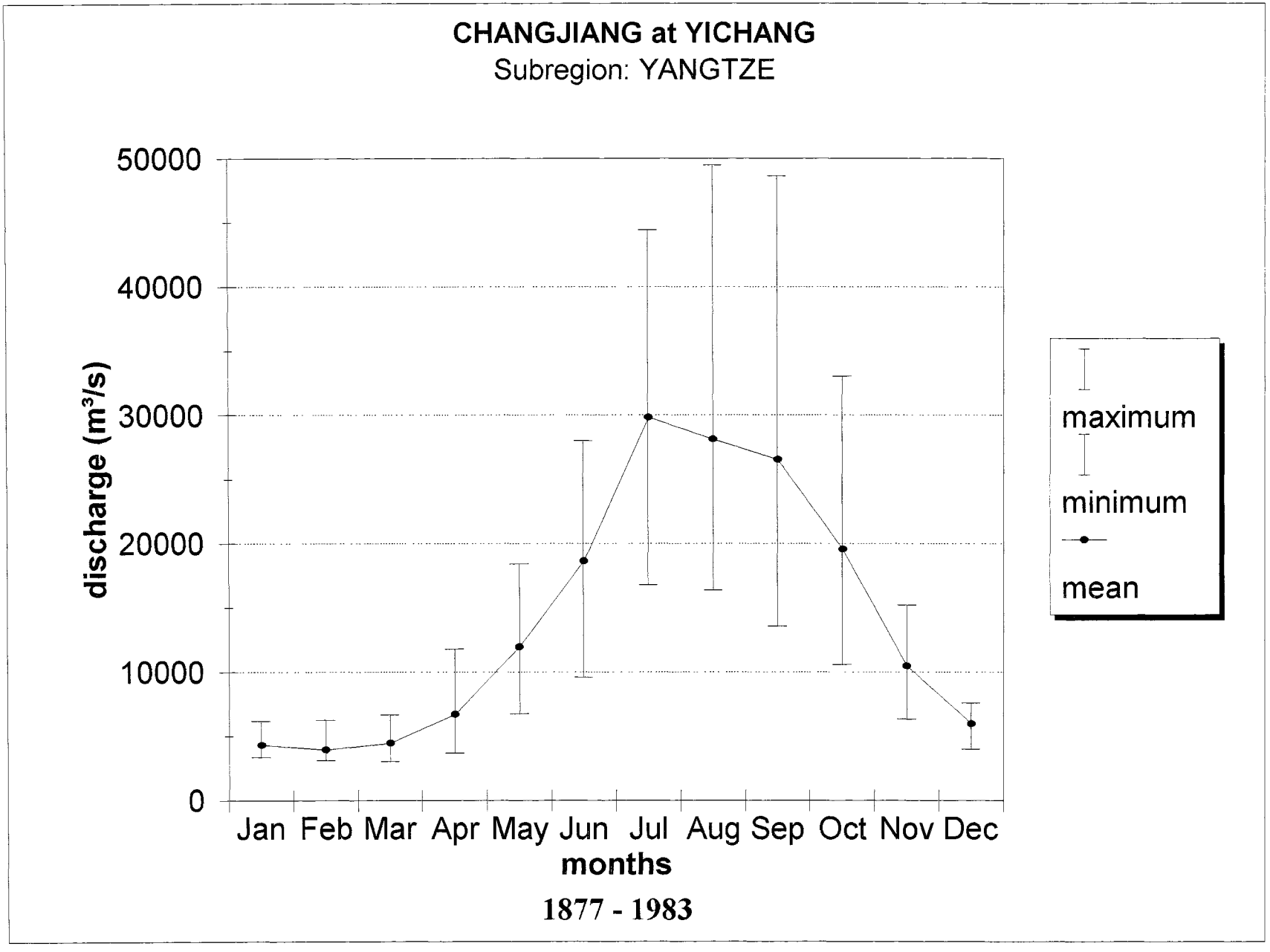

CHANGJIANG (YANGTZE) at DATONG
GRDC-No.: 2181900
Drainage area: 1705383 km³
runoff (mm)
discharge (m³/s)
35
30
25
20
15
10
5
0
30000
28000
26000
24000
22000
20000
1976
1977
1978
1979
1976 - 1979
runoff
av. discharge/year
trend of runoff

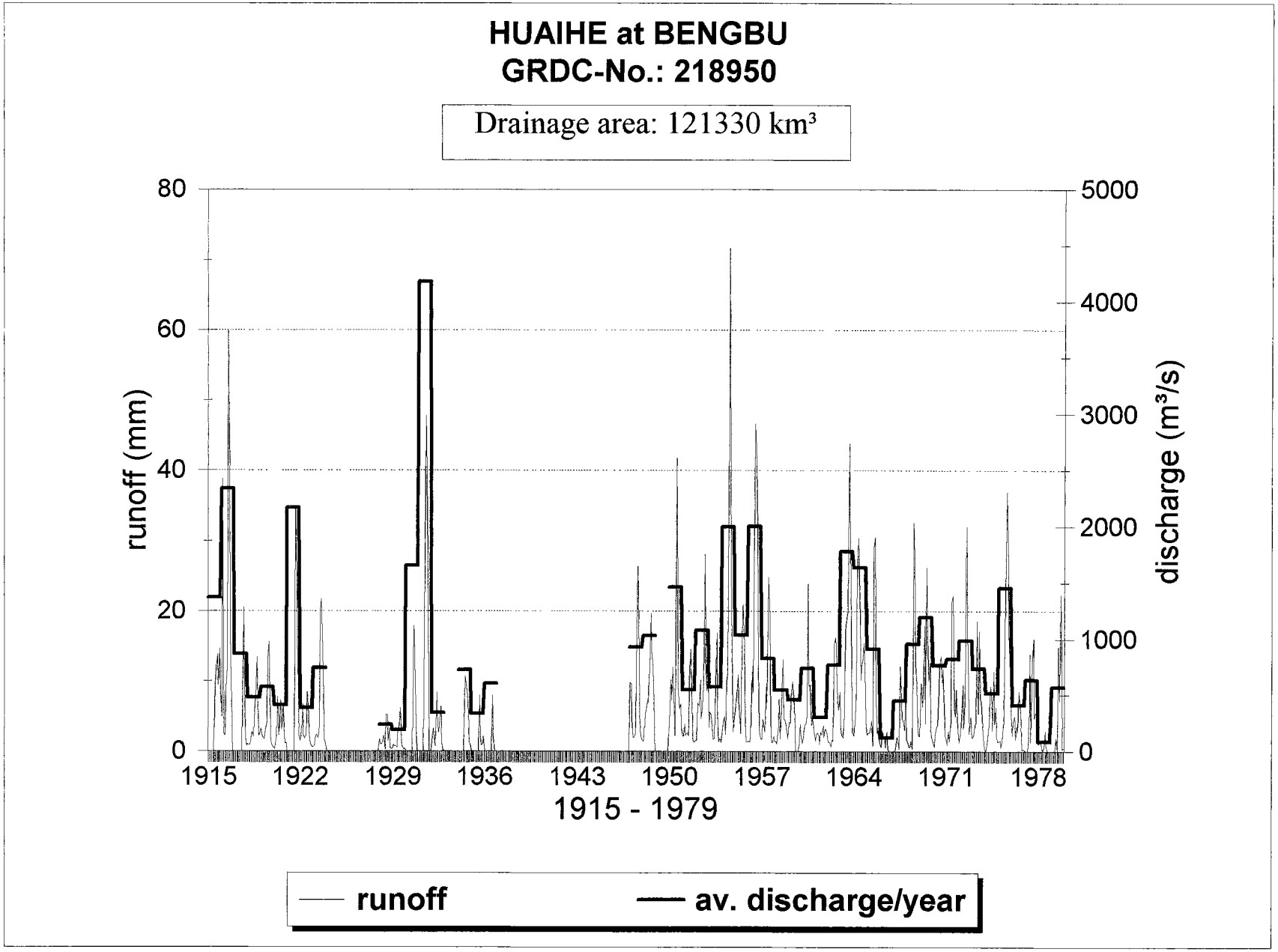

CHANGJIANG at DATONG
Subregion: YANGTZE
60000
50000
40000
30000
20000
10000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1976 - 1979
maximum
minimum
mean

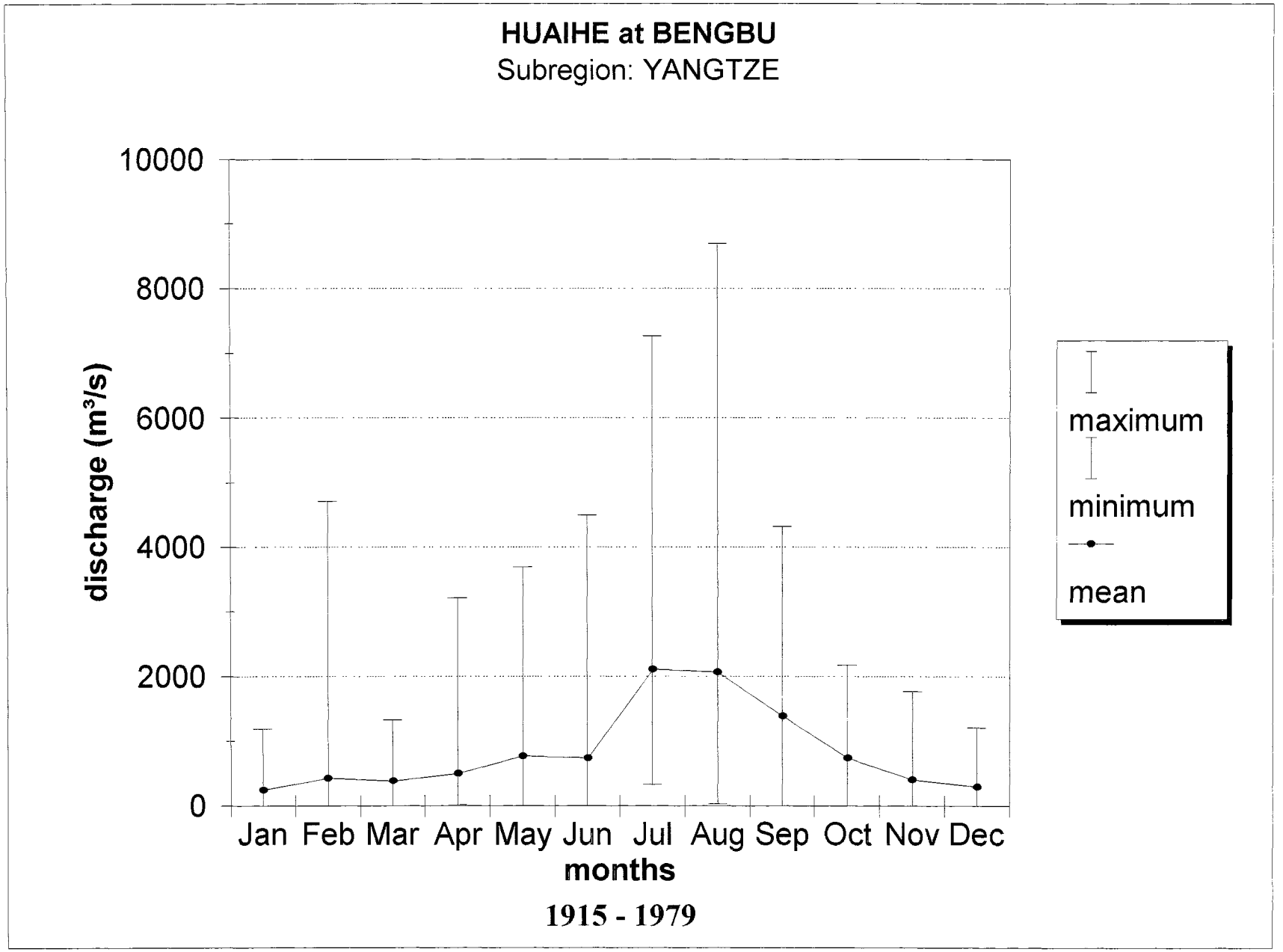

CHANGJIANG (YANGTZE) at HANKOU
GRDC-No.: 2181800
Drainage area: 1488036 km³
runoff (mm)
discharge (m³/s)
50
40
30
20
10
0
35000
30000
25000
20000
15000
10000
1865
1878
1891
1904
1917
1930
1943
1956
1969
1865 - 1979
runoff
av. discharge/year
trend of runoff

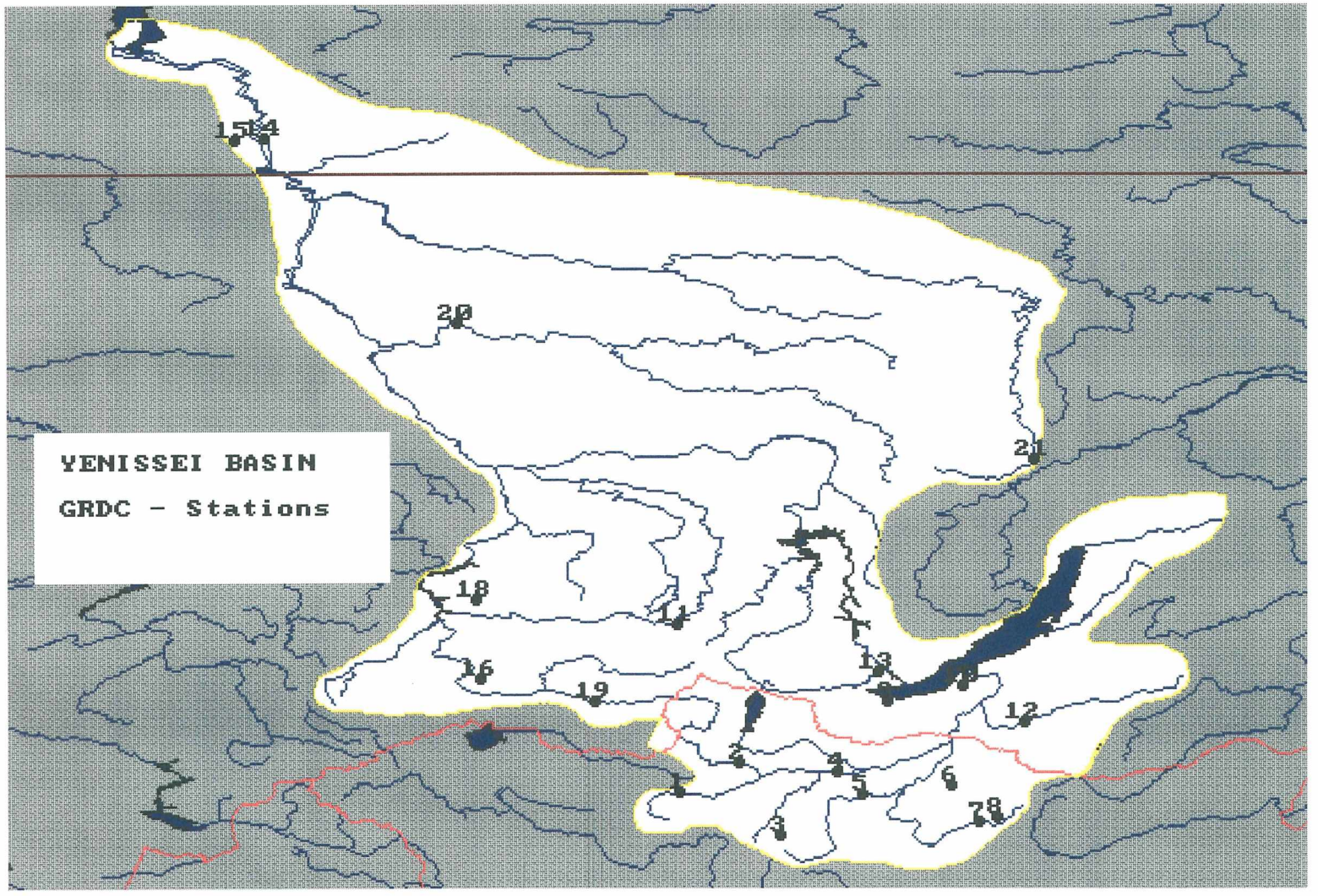

CHANGJIANG at HANKOU
Subregion: YANGTZE
70000
60000
50000
40000
30000
20000
10000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
maximum
minimum
mean
1865 - 1979


CHANGJIANG (YANGTZE) at YICHANG
GRDC-No.: 2181600
Drainage area: 1010000 km³
runoff (mm)
discharge (m³/s)
50
40
30
20
10
0
20000
18000
16000
14000
12000
10000
8000
6000
4000
1877
1890
1903
1916
1929
1942
1955
1968
1981
1877 - 1983
runoff
av. discharge/year
trend of runoff


CHANGJIANG at YICHANG
Subregion: YANGTZE
50000
40000
30000
20000
10000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1877 - 1983
maximum
minimum
mean

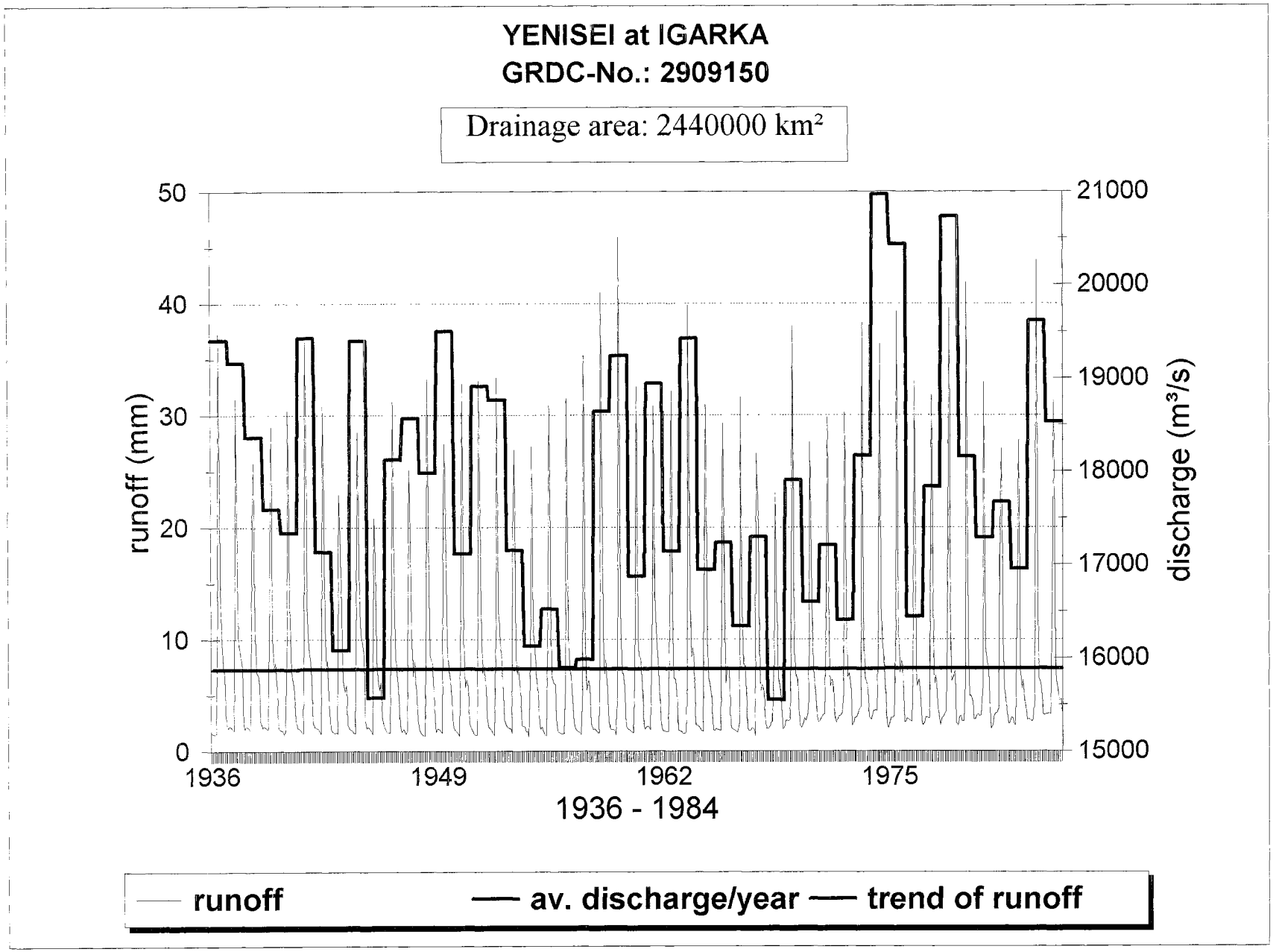

HUAIHE at BENGBU
GRDC-No.: 218950
Drainage area: 121330 km³
runoff (mm)
discharge (m³/s)
80
60
40
20
0
5000
4000
3000
2000
1000
0
1915
1922
1929
1936
1943
1950
1957
1964
1971
1978
1915 - 1979
runoff
av. discharge/year

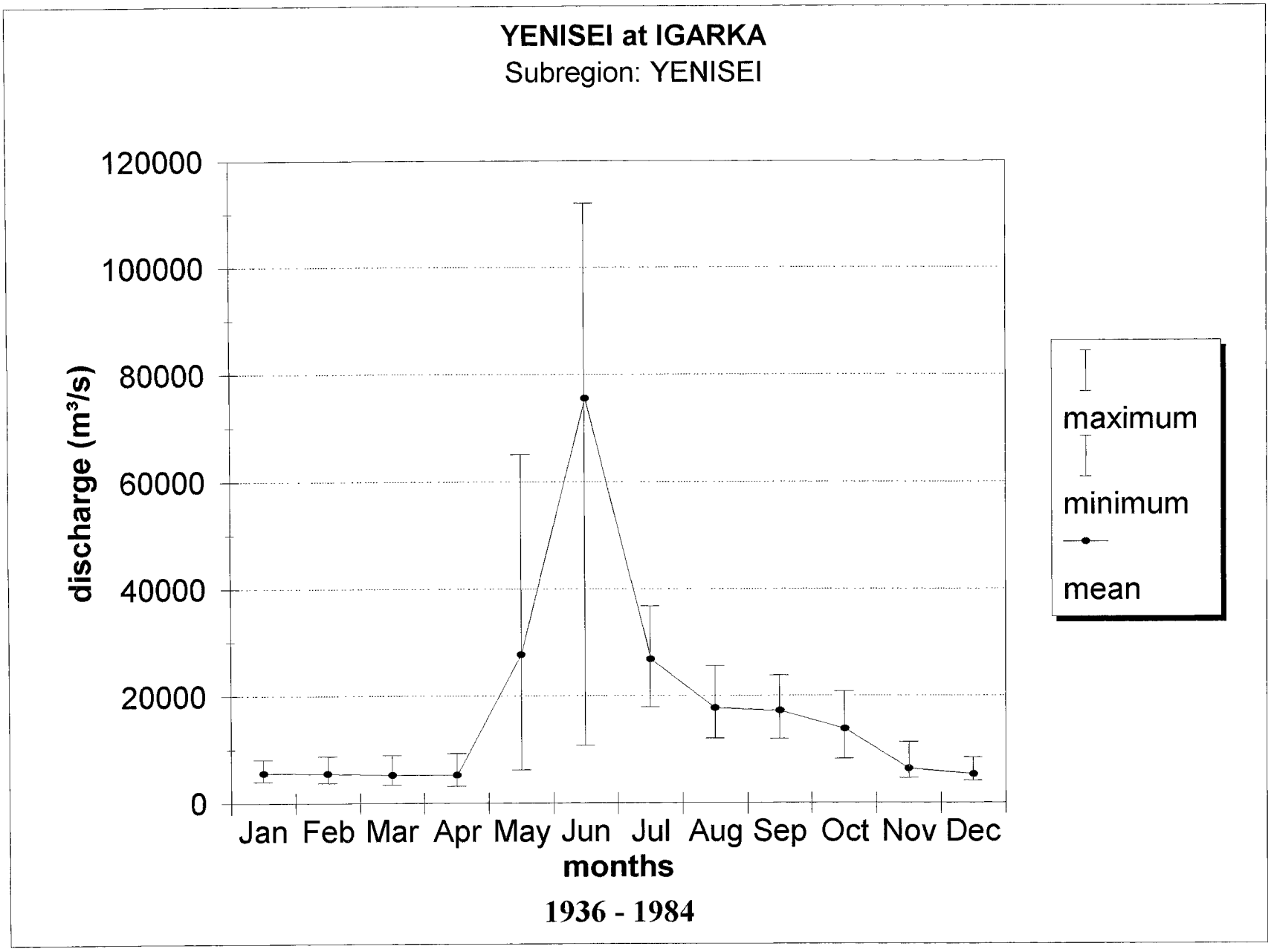

HUAIHE at BENGBU
Subregion: YANGTZE
10000
8000
6000
4000
2000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1915 - 1979
maximum
minimum
mean

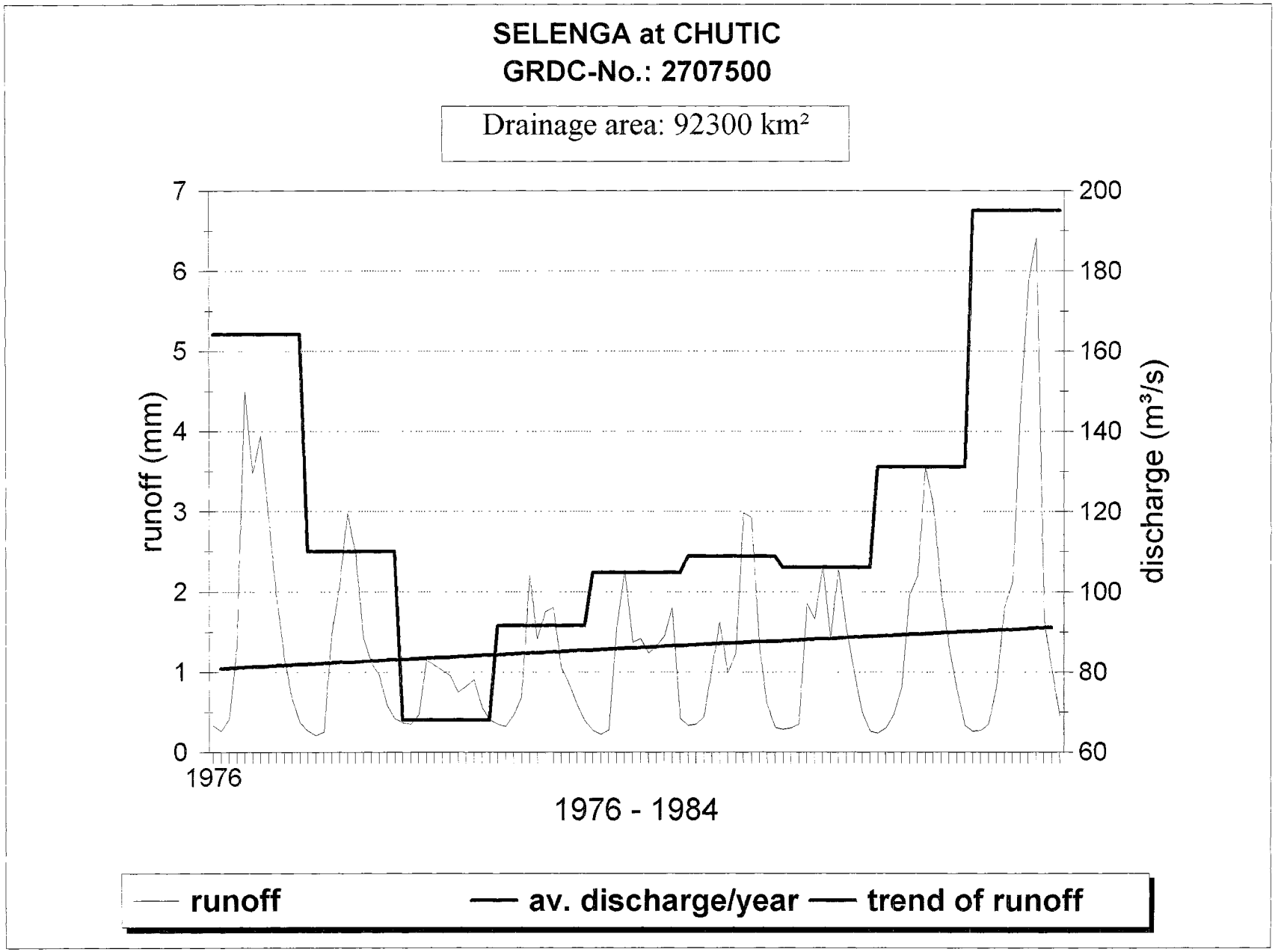

YENISSEI BASIN
GRDC - Stations
15
4
20
21
18
14
16
19
13
12
6
8
3

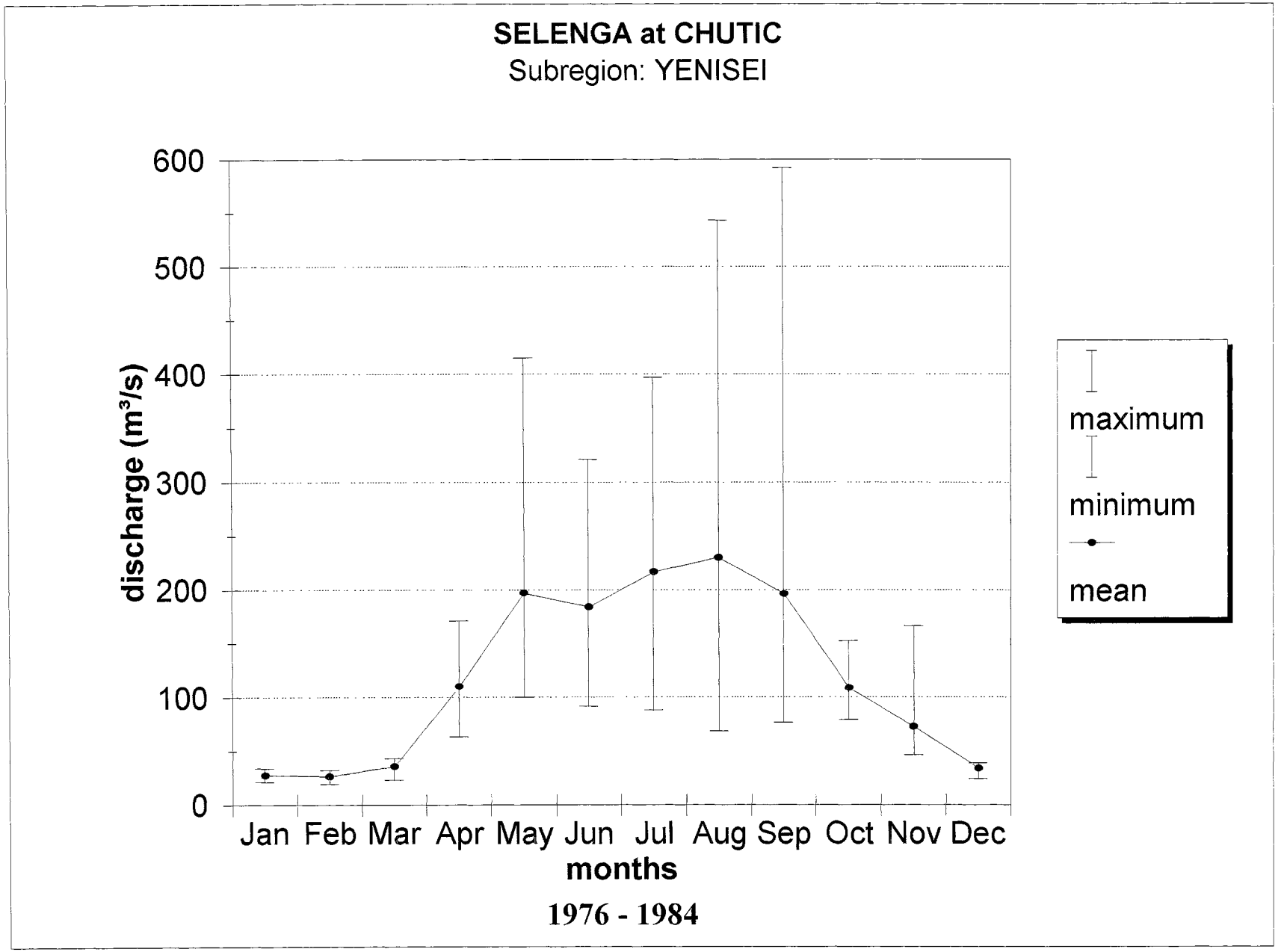
GLOBAL RUNOFF DATA CENTRE (GRDC)
20 LARGEST RIVERS

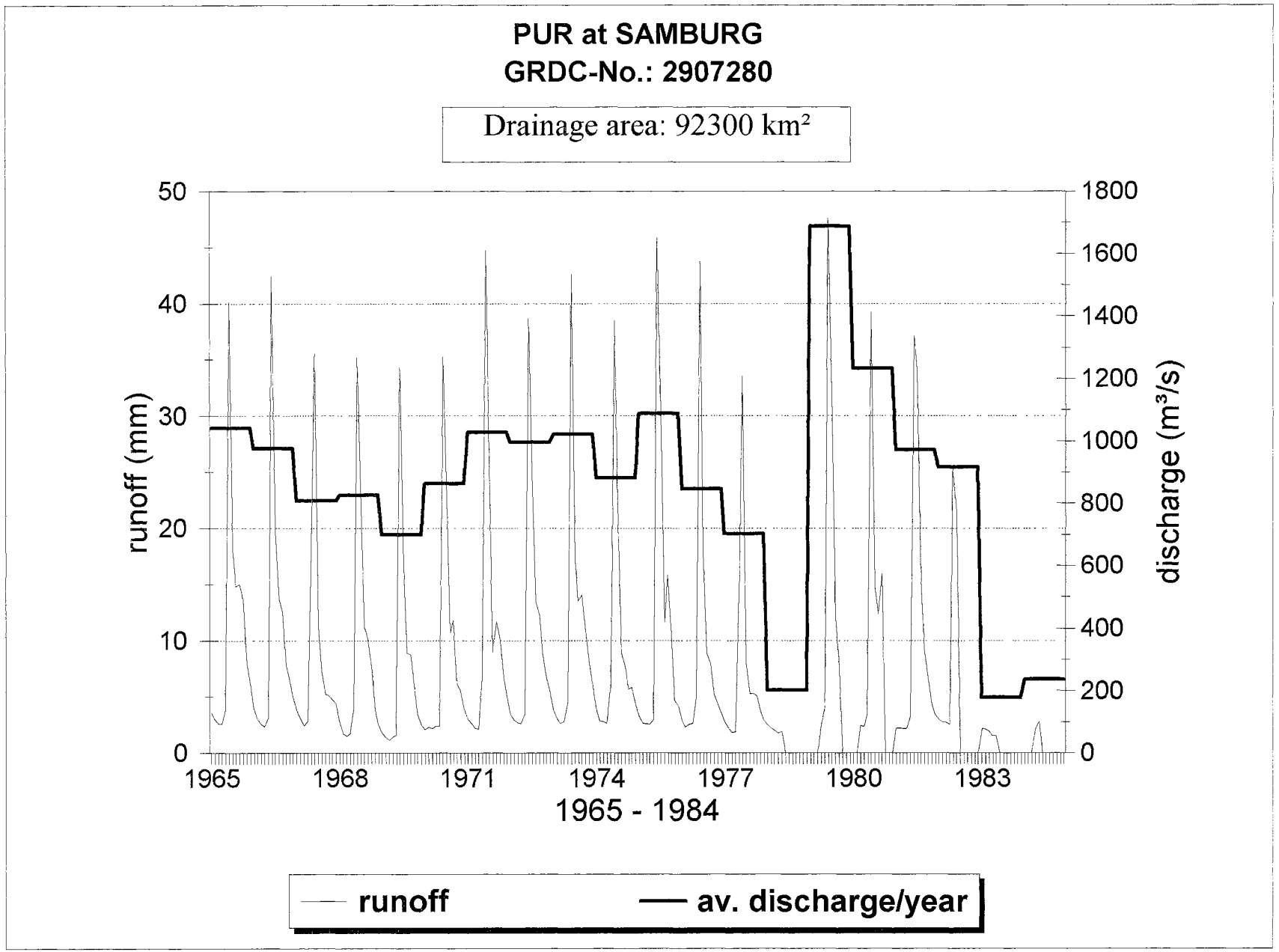
	YENISEI							
No.	River	Station	Area (km²)	Latitude	Longitude	first rec.	last rec.	day/mont
1	Ider	Tosontsengel	8012	4873N	9828E	4 1978	11 1982	D
2	Delgermuren	Muren	16300	4958N	10013E	1 1976	12 1984	M
3	Khoit Tamir	Ikh Tamir	2993	4750N	10125E	1 1978	12 1982	D
4	Selenga	Chutic	92300	4937N	10283E	1 1976	12 1984	M
5	Orkhon	Orkhon	23600	4865N	10357E	1 1976	12 1984	M
6	Kharaa	Barun Kharaa	9580	4892N	10607E	1 1978	12 1982	D
7	Tola	Ulan-Bator	6300	4790N	10692E	1 1976	12 1984	M
8	Terelj	Terelj	1232	4805N	10742E	5 1978	12 1982	D
9	Khara-Murin	Murino	1130	5136N	10431E	1 1978	12 1987	D
10	Bolshaya Rechka	Possolskaya	565	5176N	10644E	1 1978	12 1987	D
	Pur	Samburg	95100	6708N	7815E	1 1965	5 1984	M
11	Uda	Alygdzher	4980	5353N	9821E	1 1979	12 1979	D
12	Khilok	Maleta	25700	5077N	10825E	1 1965	12 1984	M
13	Olkha	Olkha	590	5210N	10403E	1 1978	12 1987	D
14	Graviyka	Igarka	323	6751N	8655E	1 1978	12 1987	D
15	**Yenisei**	**Igarka**	**2440000**	**6748N**	**8650E**	**1 1936**	**12 1984**	**M**
16	Us	Ust-Zolotaya	6110	5203N	9266E	1 1978	12 1987	D
17	Markha	Malykai	89600	6343N	11705E	1 1965	12 1984	M
18	Syda	Otrok	1480	5433N	9250E	1 1978	12 1987	D
19	Sizim	Sizim	867	5136N	9596E	1 1978	12 1987	D
20	Podkamennaya Tunguska	Kuzmovka	218000	6222N	9202E	1 1965	12 1984	M
21	Nizhnaya Tunguska	Podvoloshino	8270	5828N	10841E	1 1978	12 1987	D
	Chernaya	Chernoye Ii	301			1 1978	12 1987	D
	Mikhanskij	Velmo 2	32.3			1 1978	12 1987	D

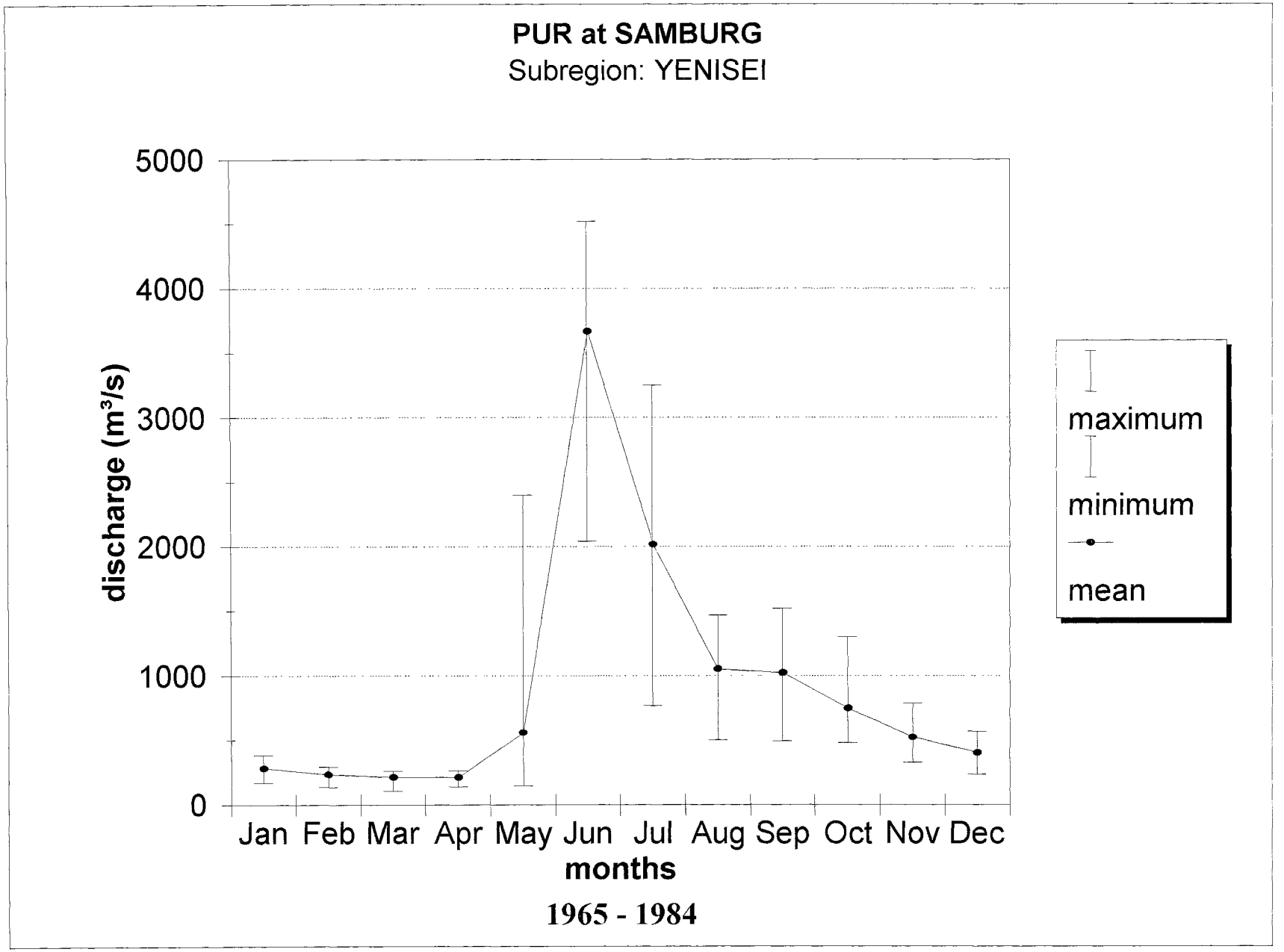

YENISEI at IGARKA
GRDC-No.: 2909150
Drainage area: 2440000 km²
runoff (mm)
discharge (m³/s)
0
10
20
30
40
50
15000
16000
17000
18000
19000
20000
21000
1936
1949
1962
1975
1936 - 1984
runoff
av. discharge/year
trend of runoff

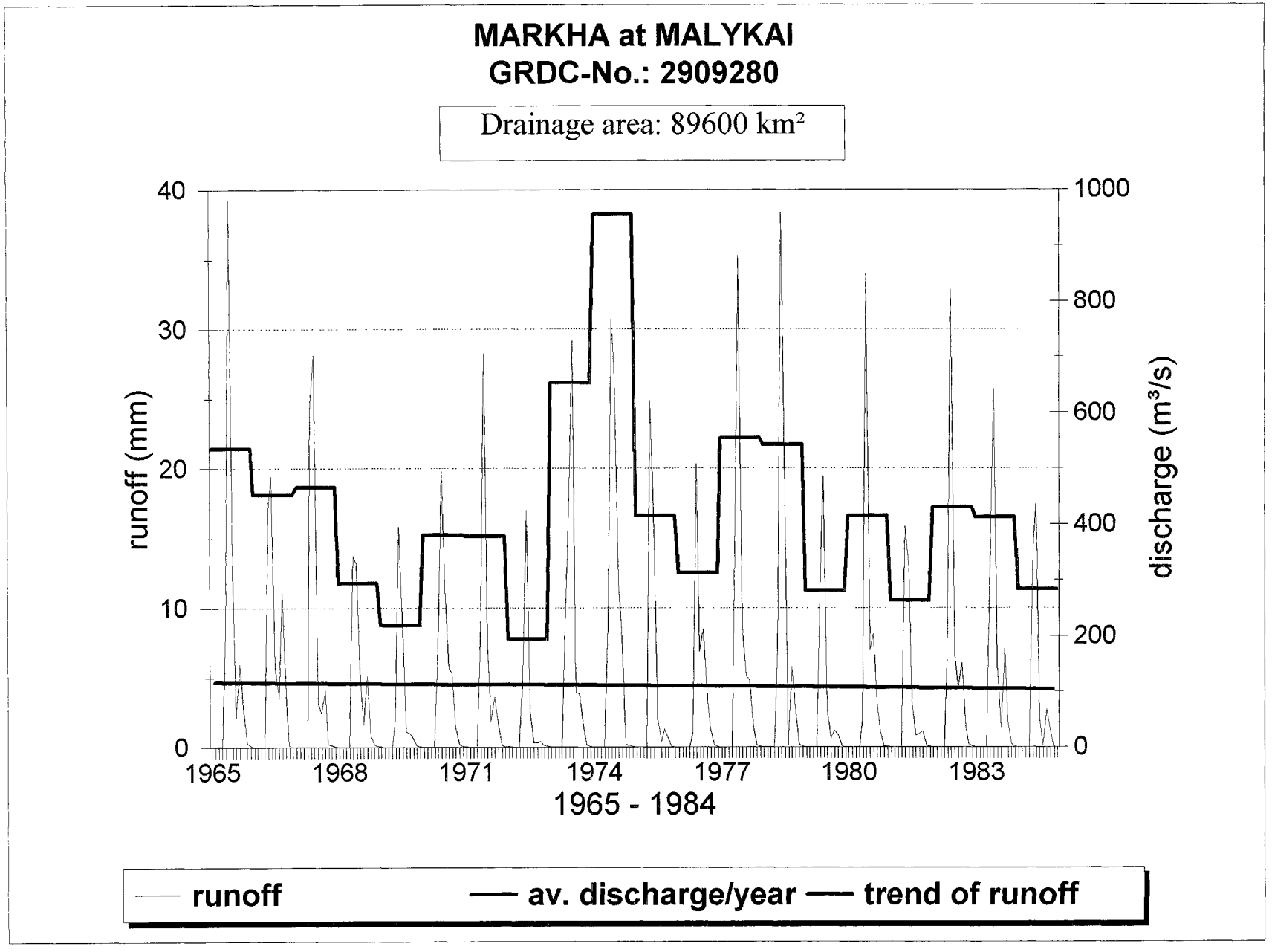

YENISEI at IGARKA
Subregion: YENISEI
120000
100000
80000
60000
40000
20000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
maximum
minimum
mean
1936 - 1984

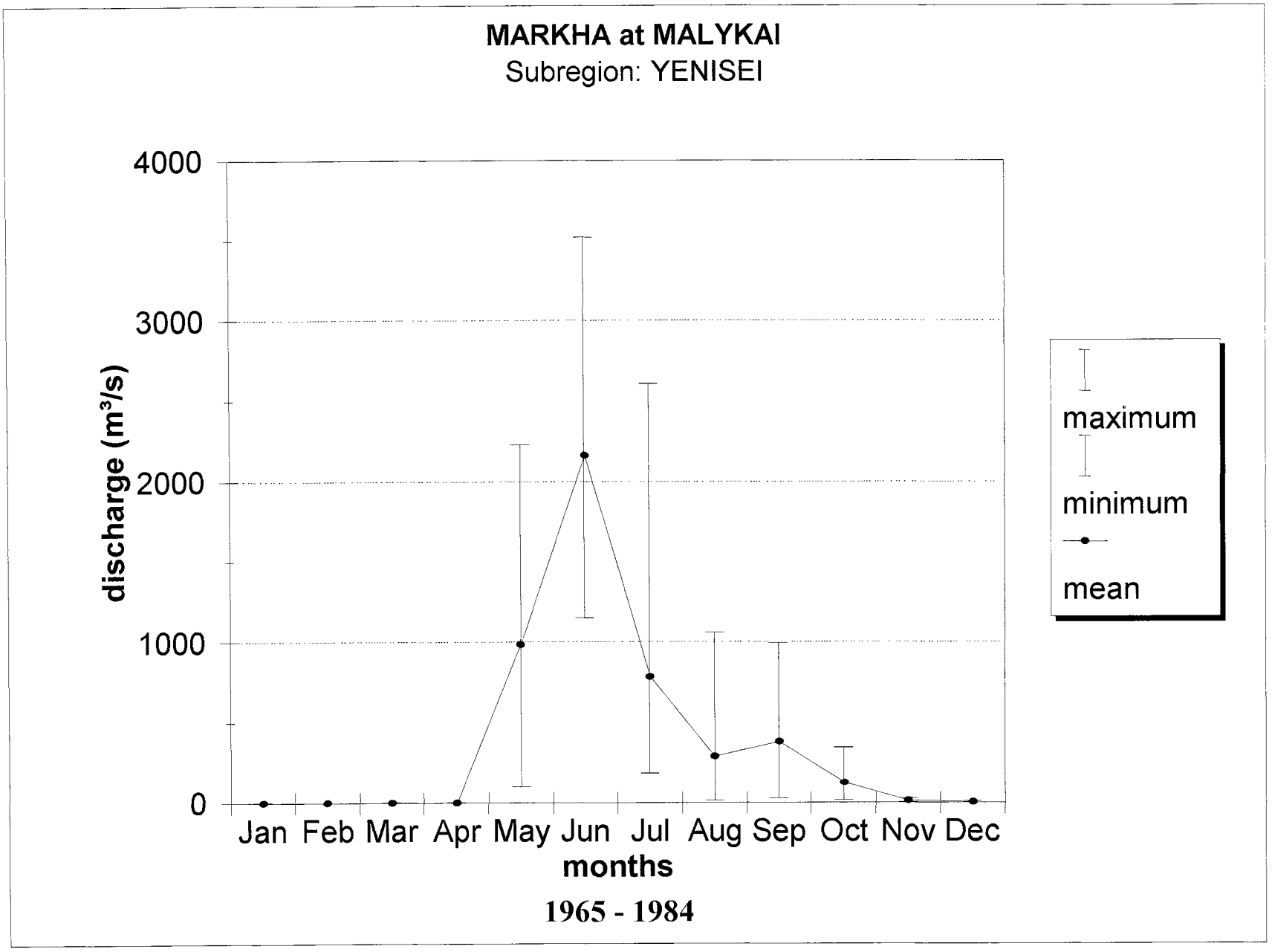

SELENGA at CHUTIC
GRDC-No.: 2707500
Drainage area: 92300 km²
runoff (mm)
discharge (m³/s)
0
1
2
3
4
5
6
7
60
80
100
120
140
160
180
200
1976
1976 - 1984
runoff
av. discharge/year
trend of runoff

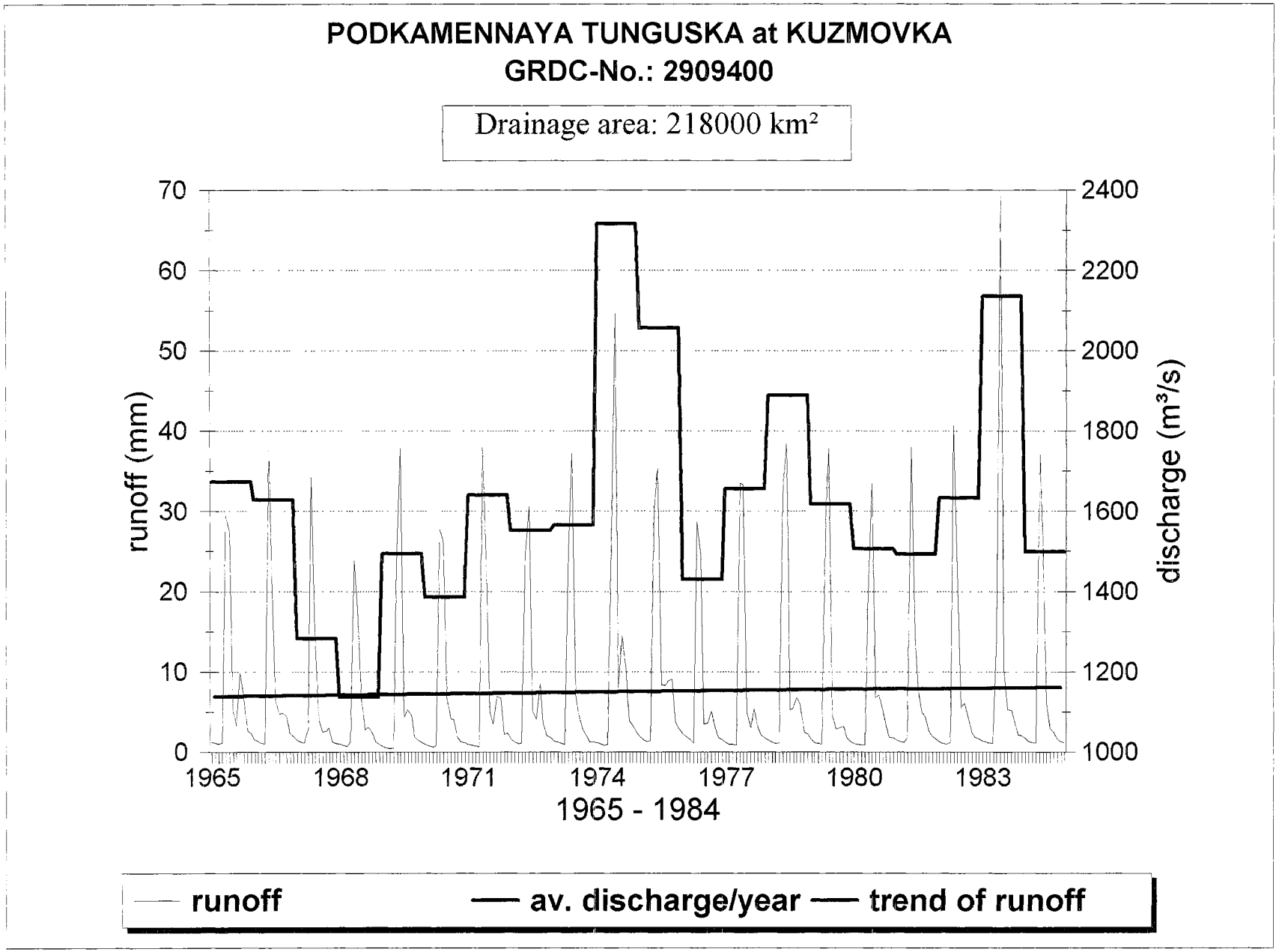

SELENGA at CHUTIC
Subregion: YENISEI
600
500
400
300
200
100
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
maximum
minimum
mean
1976 - 1984

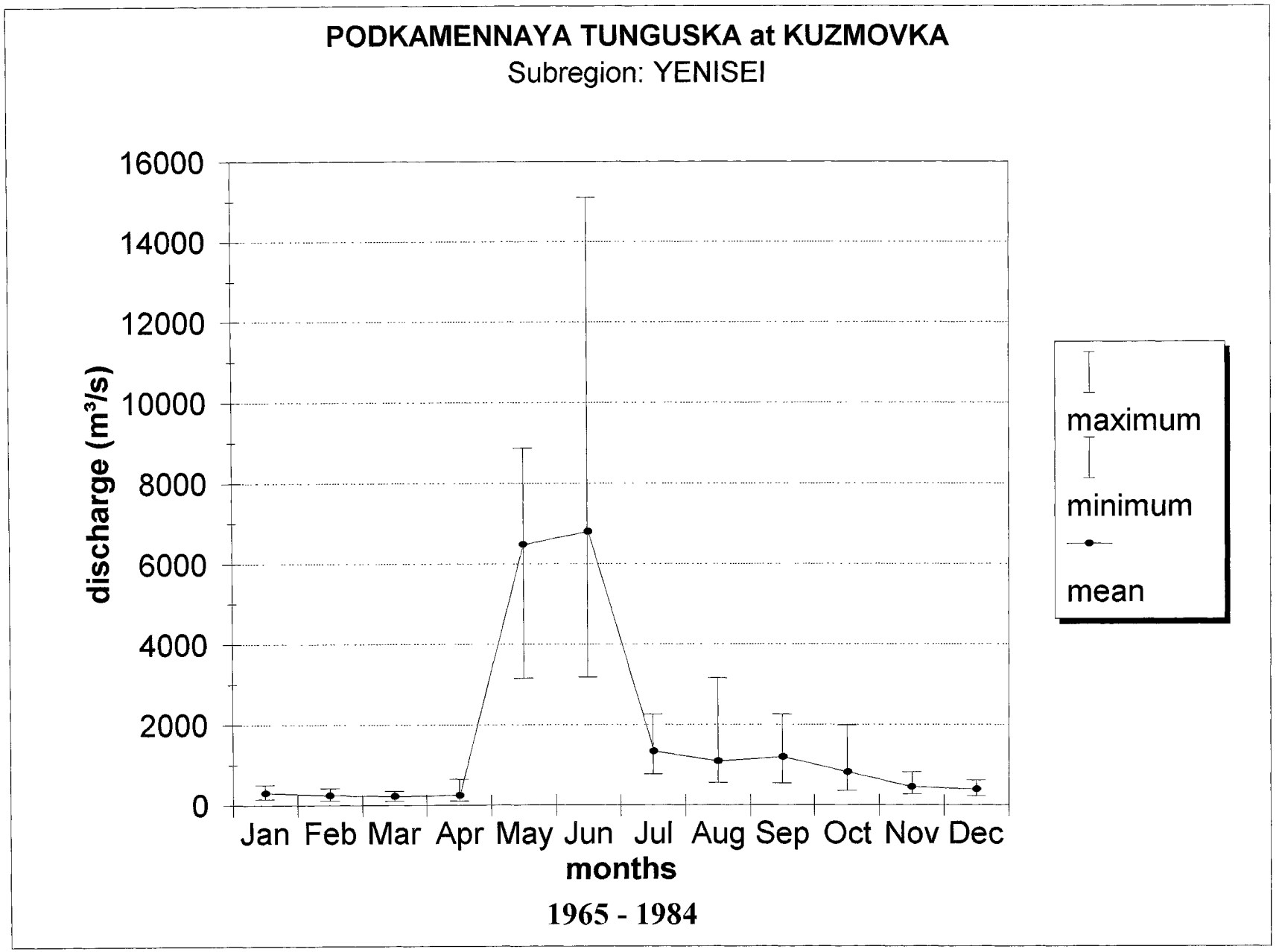

PUR at SAMBURG
GRDC-No.: 2907280
Drainage area: 92300 km²
runoff (mm)
discharge (m³/s)
0
10
20
30
40
50
0
200
400
600
800
1000
1200
1400
1600
1800
1965
1968
1971
1974
1977
1980
1983
1965 - 1984
runoff
av. discharge/year

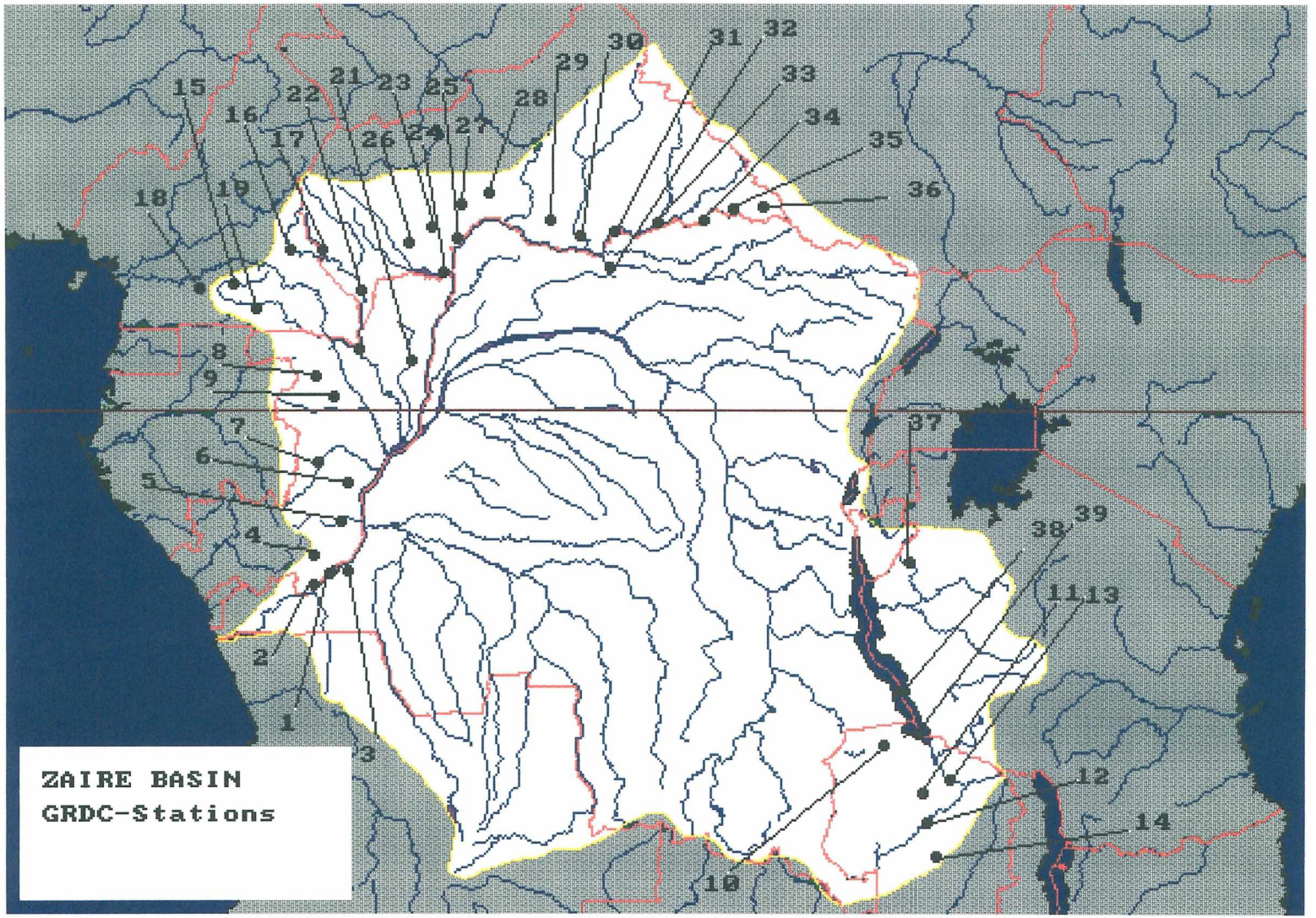

PUR at SAMBURG
Subregion: YENISEI
5000
4000
3000
2000
1000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
maximum
minimum
mean
1965 - 1984


MARKHA at MALYKAI
GRDC-No.: 2909280
Drainage area: 89600 km²
runoff (mm)
discharge (m³/s)
0
10
20
30
40
0
200
400
600
800
1000
1965
1968
1971
1974
1977
1980
1983
1965 - 1984
runoff
av. discharge/year
trend of runoff


MARKHA at MALYKAI
Subregion: YENISEI
4000
3000
2000
1000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
maximum
minimum
mean
1965 - 1984


PODKAMENNAYA TUNGUSKA at KUZMOVKA
GRDC-No.: 2909400
Drainage area: 218000 km²
runoff (mm)
discharge (m³/s)
70
60
50
40
30
20
10
0
2400
2200
2000
1800
1600
1400
1200
1000
1965
1968
1971
1974
1977
1980
1983
1965 - 1984
runoff
av. discharge/year
trend of runoff


PODKAMENNAYA TUNGUSKA at KUZMOVKA
Subregion: YENISEI
16000
14000
12000
10000
8000
6000
4000
2000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1965 - 1984
maximum
minimum
mean

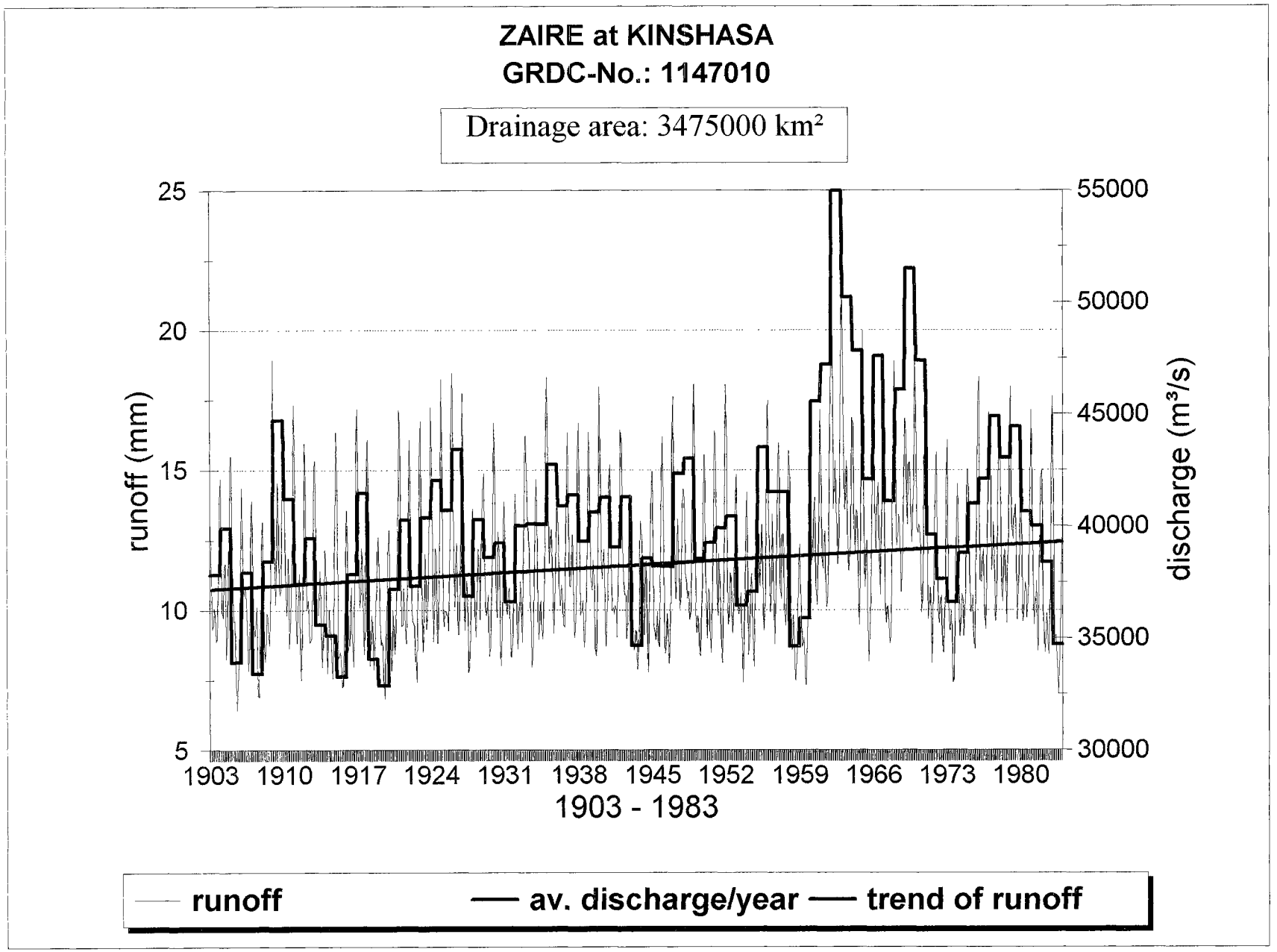

ZAIRE BASIN
GRDC-Stations
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
21
22
23
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39

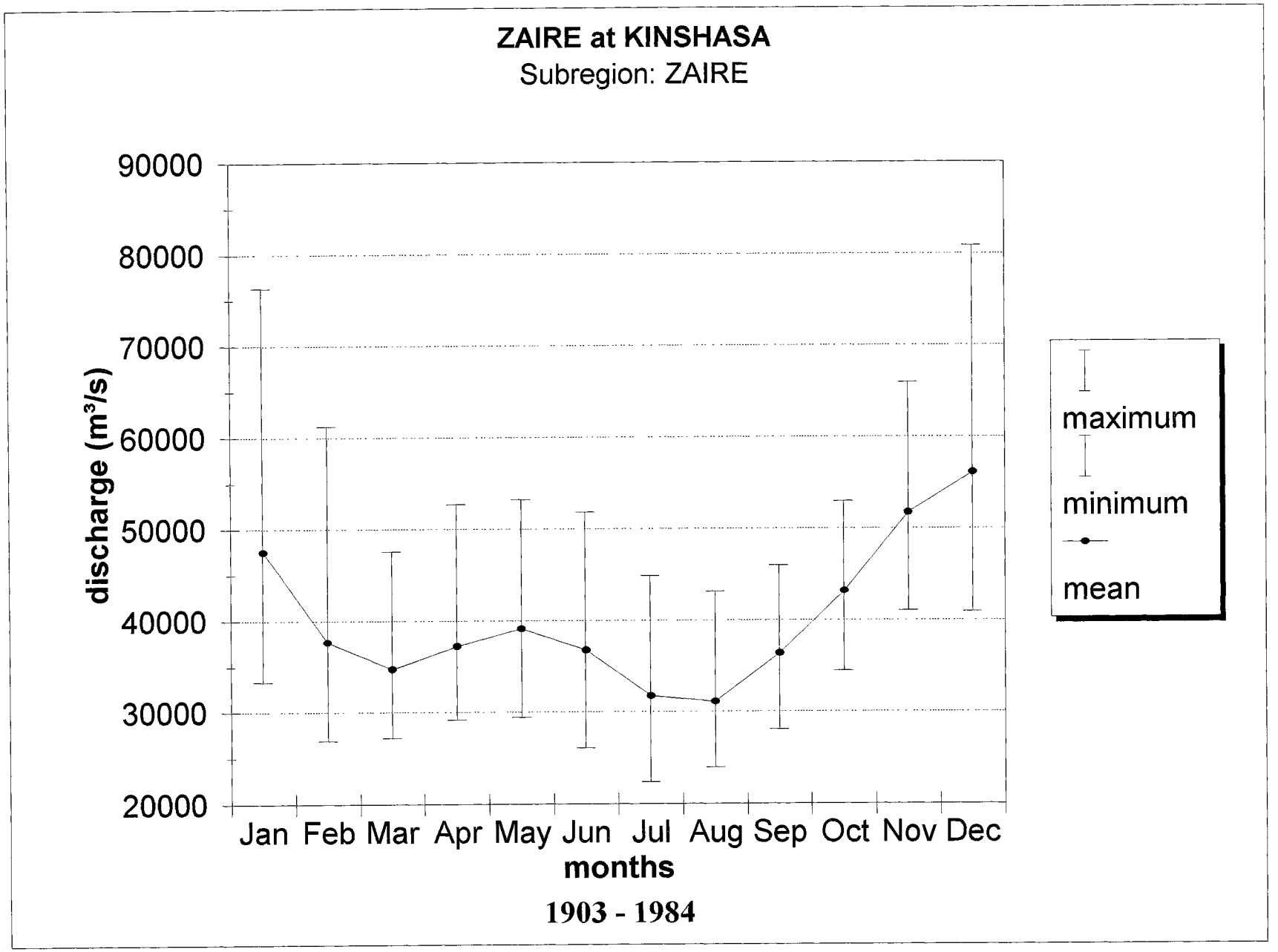
GLOBAL RUNOFF DATA CENTRE (GRDC)
20 LARGEST RIVERS

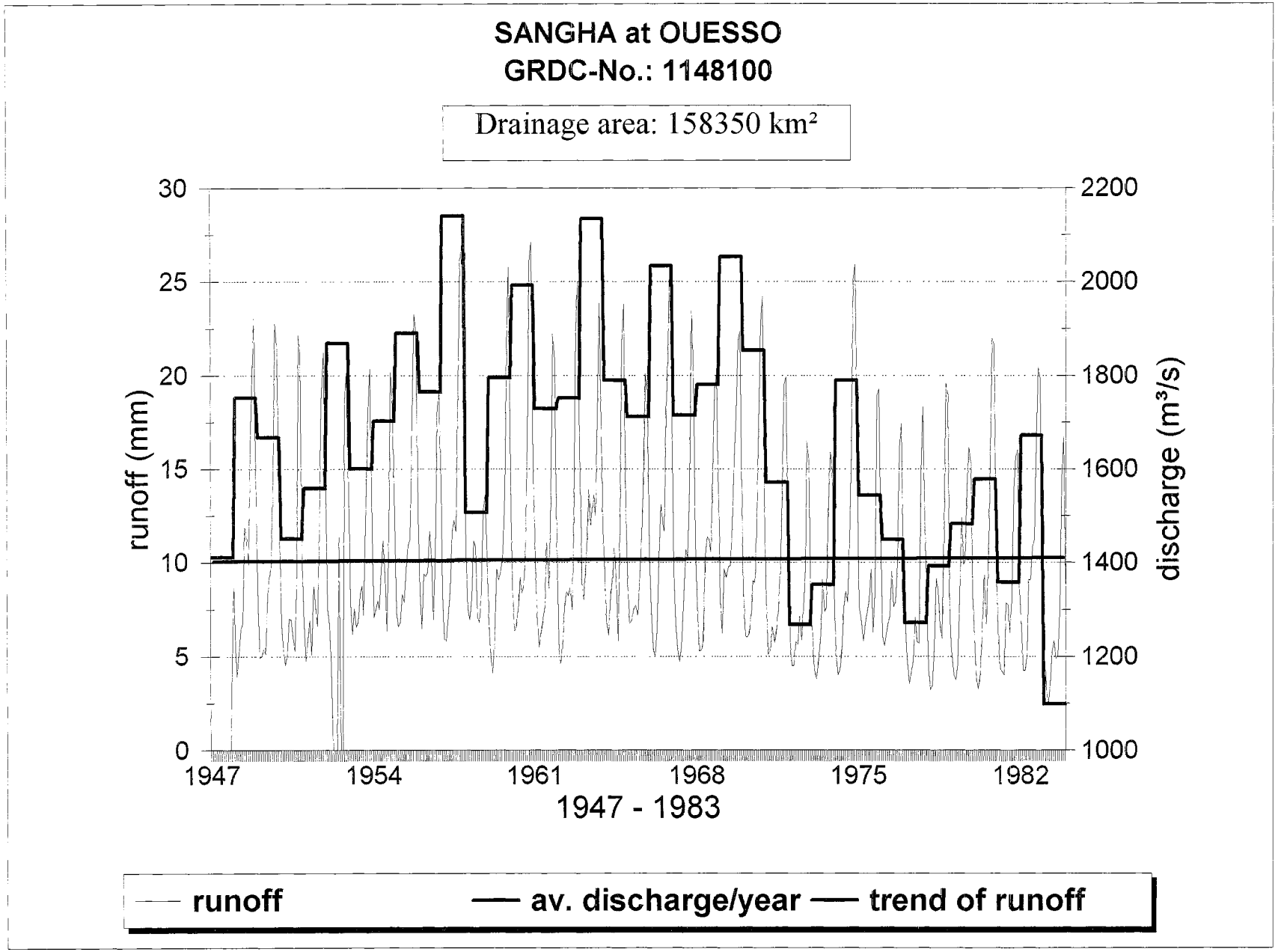
	ZAIRE							table 1
No.	River	Station	Area (km²)	Latitude	Longitude	first rec.	last rec.	day/month
1	**Zaire**	**Kinshasa**	**3475000**	**430S**	**1530E**	**1 1903**	**12 1983**	**D**
2	Foulakary	Kimpanzou	2980	460S	1493E	1 1978	12 1980	D
2	Foulakary	Kimpanzou	2980	460S	1493E	1 1973	12 1983	M
3	Congo	Brazzaville	3475000	427S	1532E	1 1971	12 1983	M
4	Djoue	Kibassi	5240	422S	1500E	1 1969	12 1972	M
5	Lefini	Bwambe	13500	291S	1565E	1 1978	12 1980	D
6	Nkeni	Gamboma	6200	190S	1585E	1 1969	12 1980	M
7	Lekori	Mbouma	2261	140S	1507E	1 1978	12 1980	D
8	Mbessi	Enkeya	1415	088N	1498E	1 1978	12 1980	D
9	Mambili	Yengo	12000	038N	1548E	1 1978	12 1980	D
10	Mwambeshi	Nsama	699	890S	2993E	10 1978	9 1981	D
10	Mwambeshi	Nsama	699	890S	2993E	1 1980	12 1984	M
11	Luombe	Chishimba Falls	2549	1012S	3095E	1 1980	12 1984	M
12	Chambeshi	Old Pontoon	33792	1095S	3107E	1 1976	12 1979	M
13	Chambeshi	Chandawayaya	4628	978S	3170E	10 1978	9 1981	D
14	Lwitikila	Mpila Kasama Road Bridge	839	1184S	3133E	10 1978	9 1981	D
15	Dja	Somalomo	5150	338N	1277E	3 1955	12 1980	M
16	Kadei	Batouri	8970	1432N	423E	5 1954	12 1980	M
17	Kadei	Pana	20370	1468N	420E	1 1965	12 1980	M
18	Boumba	Biwala	10340	1192N	322E	4 1965	12 1980	M
19	Dja	Bie	19500	1335N	280E	4 1971	12 1978	M
	Dja	Ngbala	38600			6 1954	11 1978	M
20	Sangha	Ouesso	158350	162N	1605E	12 1947	12 1983	M
21	Likouala-Aux-Herbes	Epena	11300	135N	1748E	1 1978	12 1980	D
22	Sangha	Salo	68300	318N	1612E	4 1985	3 1988	D
22	Sangha	Salo	68300	318N	1612E	4 1953	3 1988	M
23	M'bali	Boali	4560	488N	1803E	4 1985	3 1988	D
23	M'bali	Boali	4560	488N	1803E	4 1949	3 1973	M
24	Lobaye	M'bata	31000	367N	1830E	5 1986	3 1987	D
24	Lobaye	M'bata	31000	367N	1830E	11 1950	3 1987	M
25	M'poko	Bossele-Bali	10800	453N	1847E	4 1985	3 1988	D

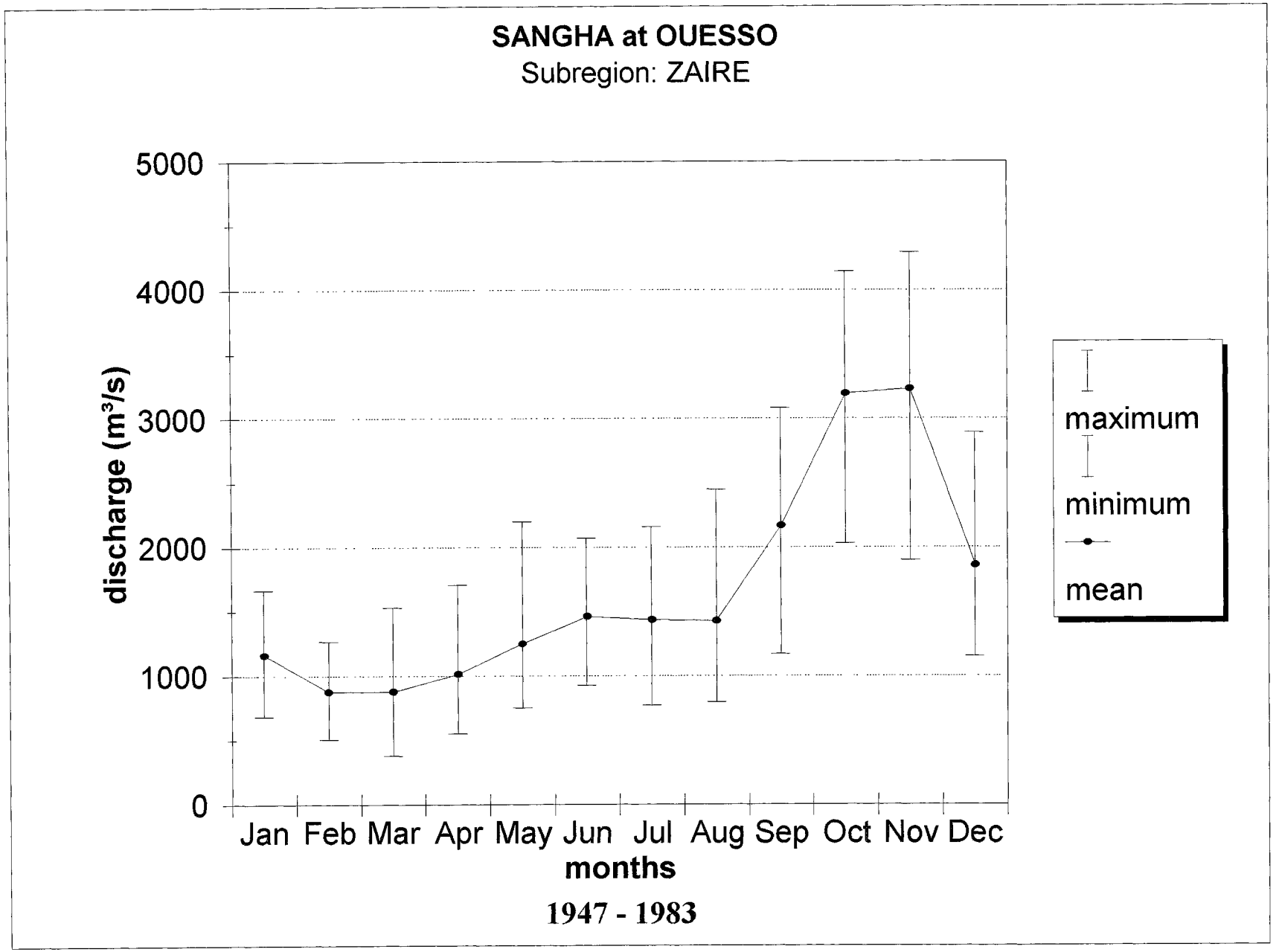
GLOBAL RUNOFF DATA CENTRE (GRDC)
20 LARGEST RIVERS

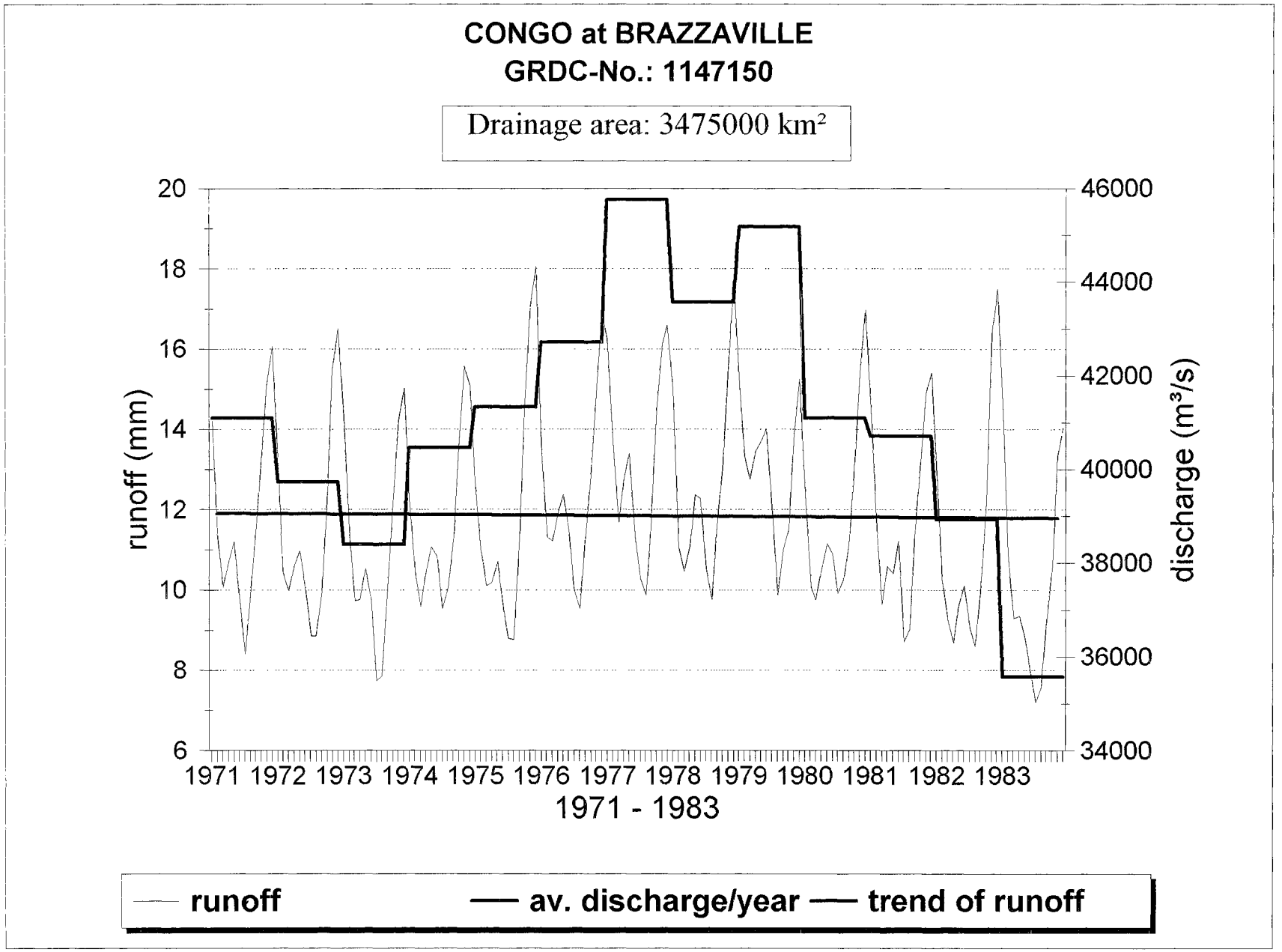
	ZAIRE							table 2
No.	River	Station	Area (km²)	Latitude	Longitude	first rec.	last rec.	day/month
25	M'poko	Bossele-Bali	10800	453N	1847E	10 1957	2 1988	M
26	Oubangui	Bangui	500000	437N	1858E	4 1985	3 1988	D
26	Oubangui	Bangui	500000	437N	1858E	3 1911	12 1975	M
27	Ombella	Ombella	3420	517N	1887E	4 1987	3 1988	D
28	Tomi	Sibut	2380	573N	1908E	4 1986	3 1988	D
28	Tomi	Sibut	2380	573N	1908E	8 1951	3 1974	M
29	Bangui-Kette	Alindao	4450	505N	2120E	4 1987	3 1988	D
30	Kotto	Kembe	78400	460N	2192E	4 1948	3 1973	M
31	M'bomou	Bangassou	115000	472N	2282E	5 1986	3 1988	D
31	M'bomou	Bangassou	11500	472N	2282E	5 1986	3 1988	M
32	M'bari	Loungoumba	23300	473N	2268E	4 1987	2 1988	D
33	Chinko	Rafai	52500	497N	2392E	7 1952	3 1973	M
34	M'bomou	Zemio	29300	503N	2515E	4 1986	3 1988	D
34	M'bomou	Zemio	29300	503N	2515E	8 1952	3 1988	M
35	Kerre	Kerre	3740	535N	2575E	4 1986	3 1988	D
36	M'bokou	Obo	5670	540N	2650E	4 1985	3 1988	D
37	Malagarasi	Taragi Road Bridge	8525	403S	3058E	1 1971	12 1979	M
38	Luamfi	Masolo	531	747S	3037E	1 1978	12 1988	M
39	Lufubu	Keso Falls	4098	870S	3062E	10 1978	9 1981	D

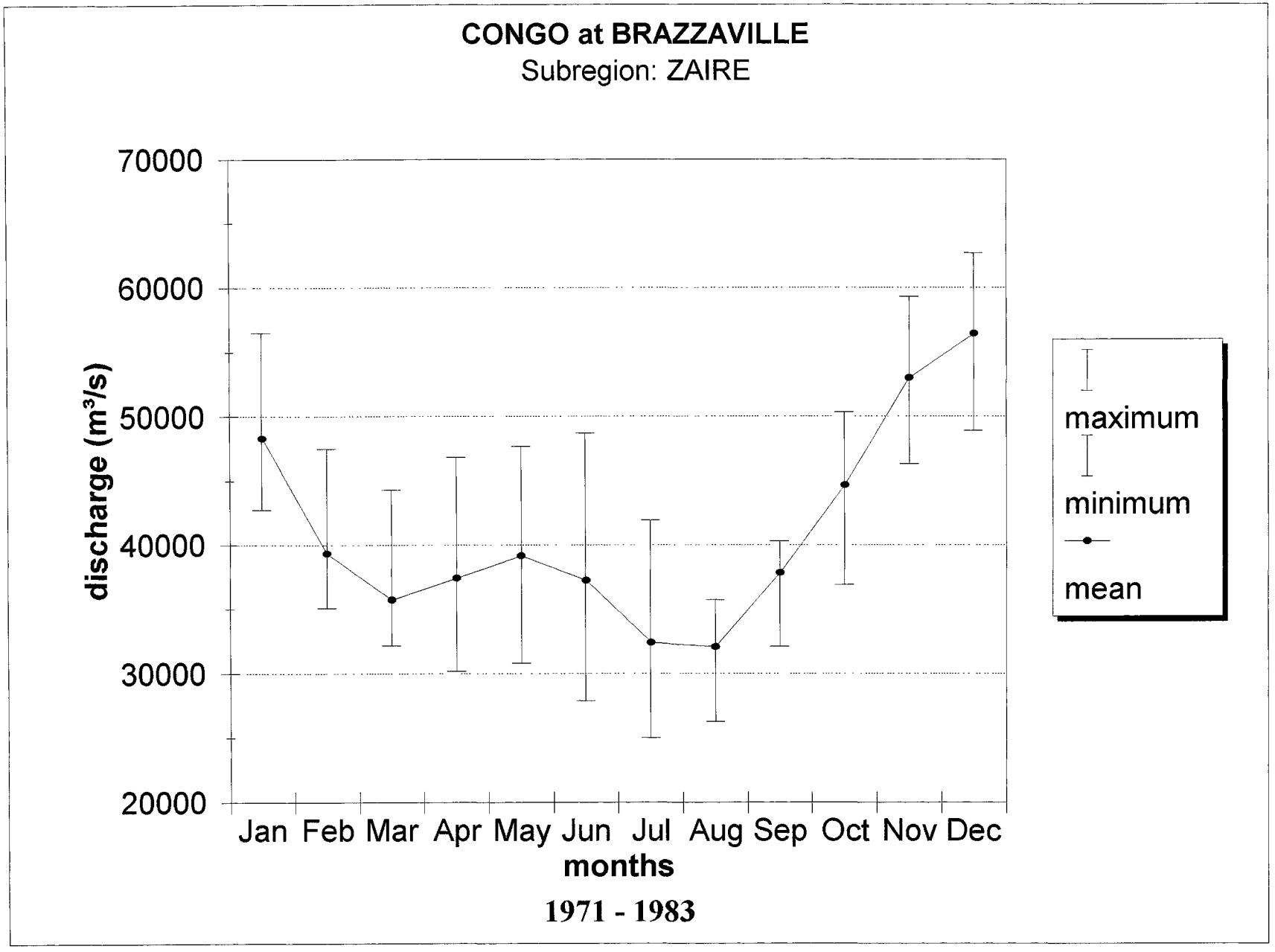

ZAIRE at KINSHASA
GRDC-No.: 1147010
Drainage area: 3475000 km²
runoff (mm)
discharge (m³/s)
25
20
15
10
5
55000
50000
45000
40000
35000
30000
1903 1910 1917 1924 1931 1938 1945 1952 1959 1966 1973 1980
1903 - 1983
runoff
av. discharge/year
trend of runoff

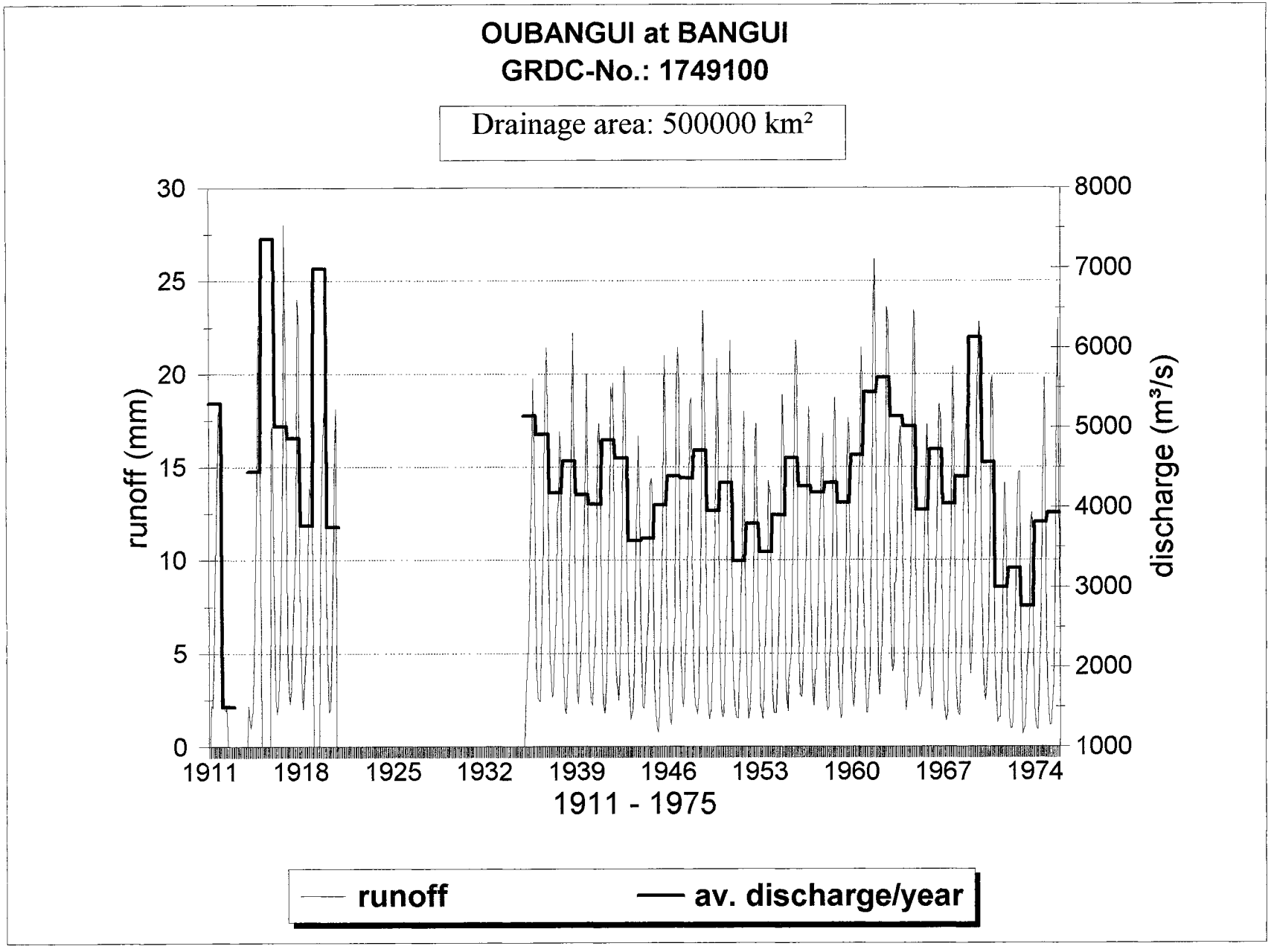

ZAIRE at KINSHASA
Subregion: ZAIRE
90000
80000
70000
60000
50000
40000
30000
20000
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
maximum
minimum
mean
1903 - 1984

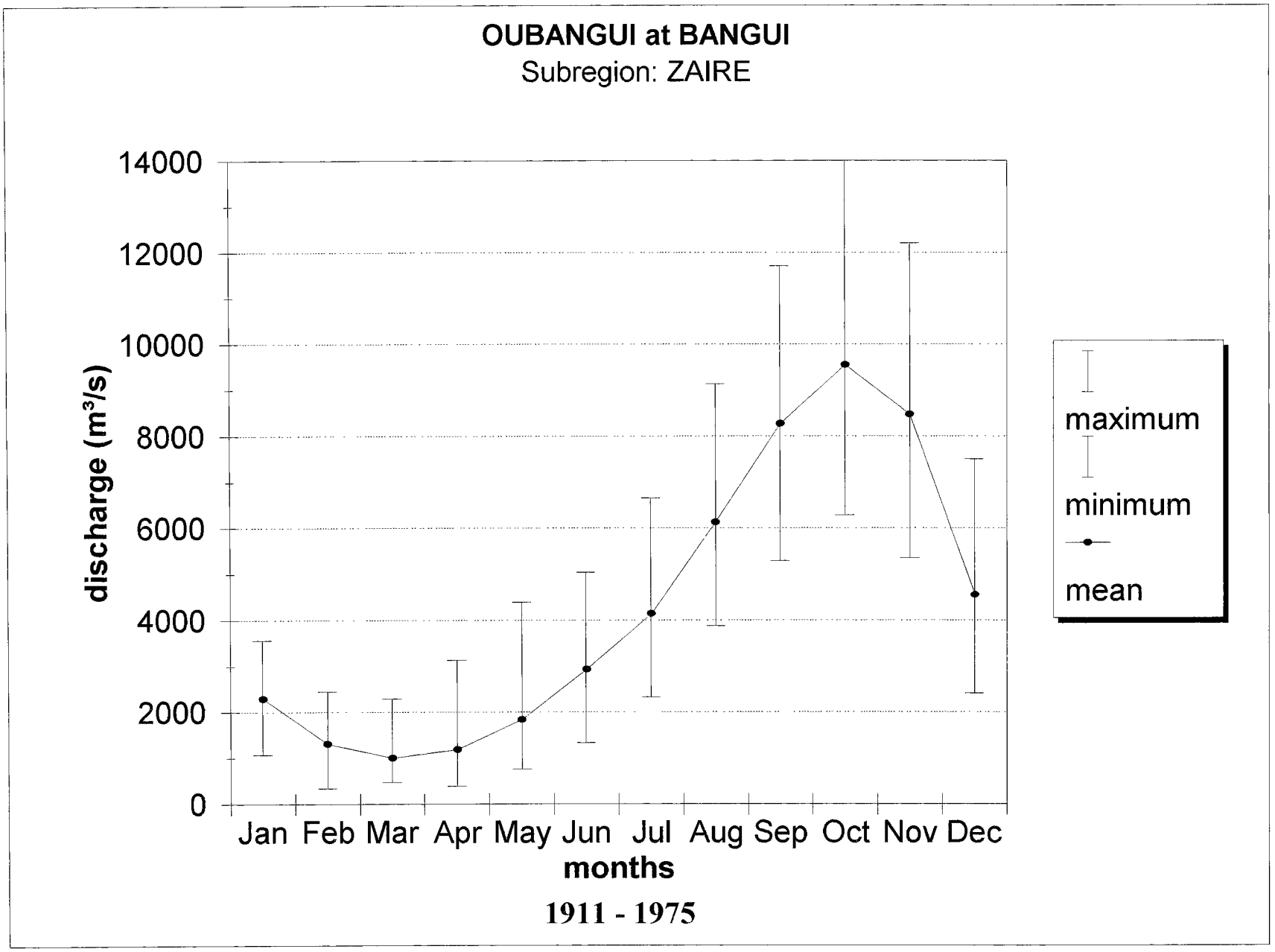

SANGHA at OUESSO
GRDC-No.: 1148100
Drainage area: 158350 km²
runoff (mm)
discharge (m³/s)
30
25
20
15
10
5
0
2200
2000
1800
1600
1400
1200
1000
1947
1954
1961
1968
1975
1982
1947 - 1983
runoff
av. discharge/year
trend of runoff

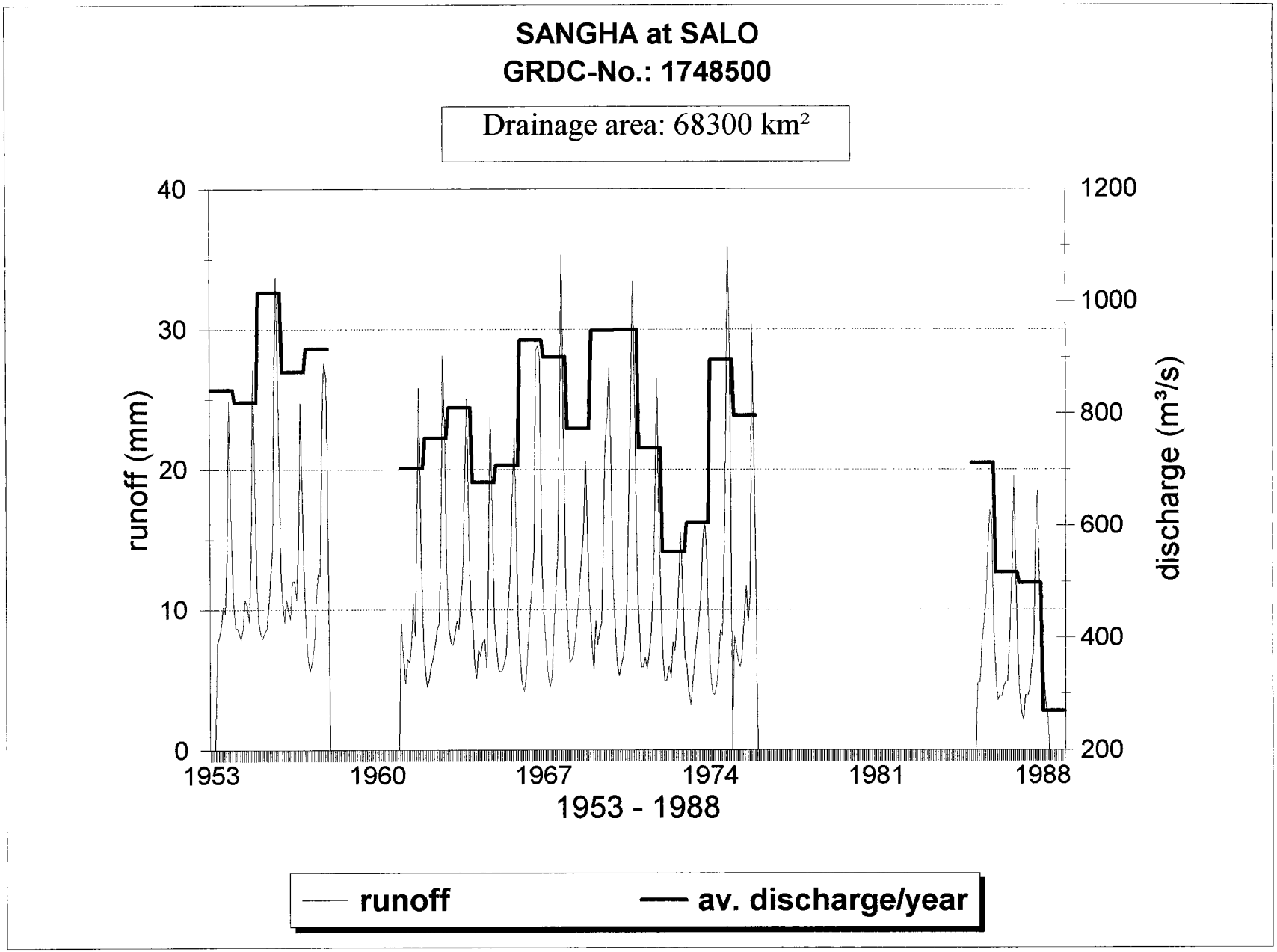

SANGHA at OUESSO
Subregion: ZAIRE
5000
4000
3000
2000
1000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1947 - 1983
maximum
minimum
mean

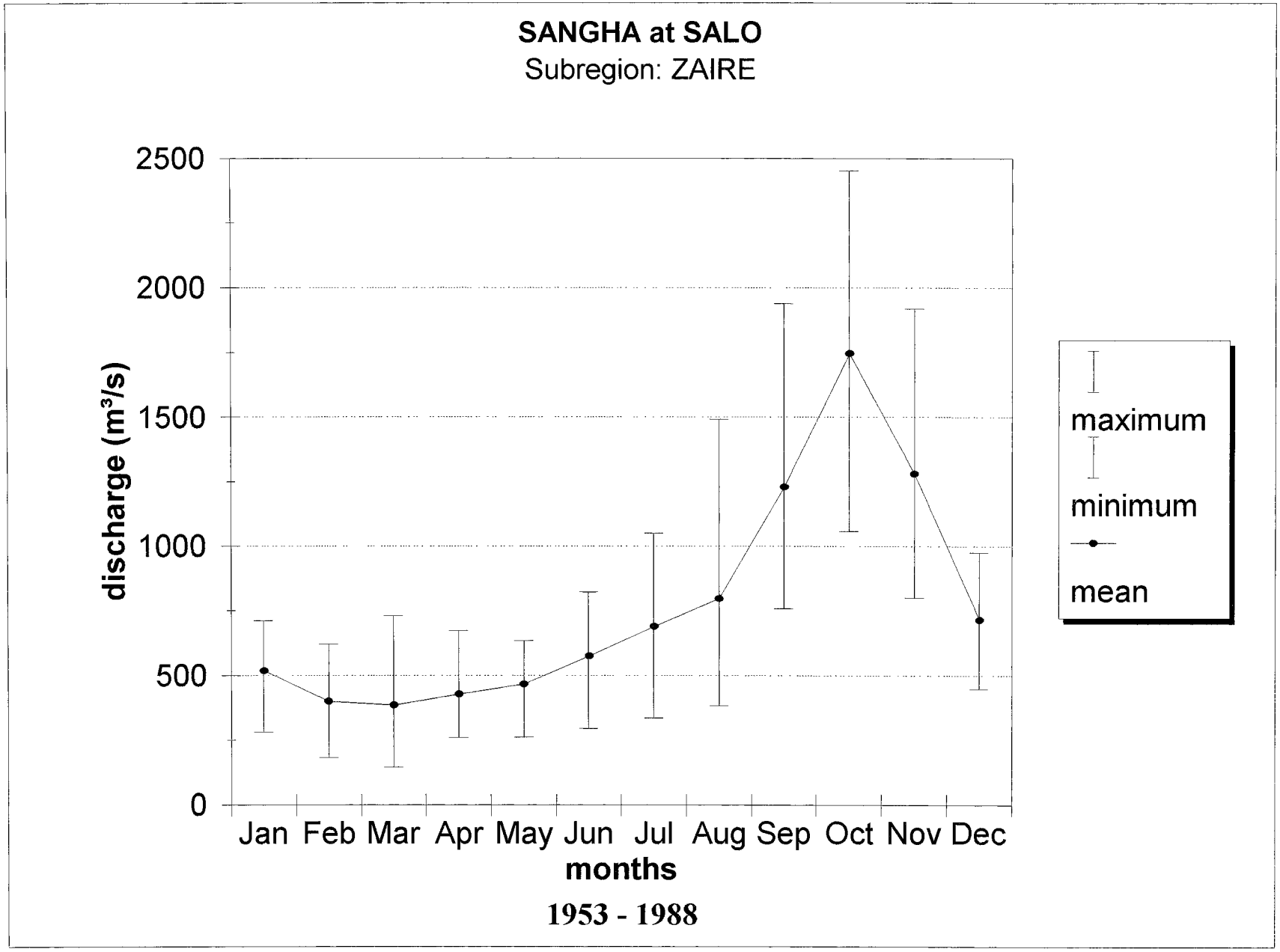

CONGO at BRAZZAVILLE
GRDC-No.: 1147150
Drainage area: 3475000 km²
runoff (mm)
discharge (m³/s)
20
18
16
14
12
10
8
6
46000
44000
42000
40000
38000
36000
34000
1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983
1971 - 1983
runoff
av. discharge/year
trend of runoff

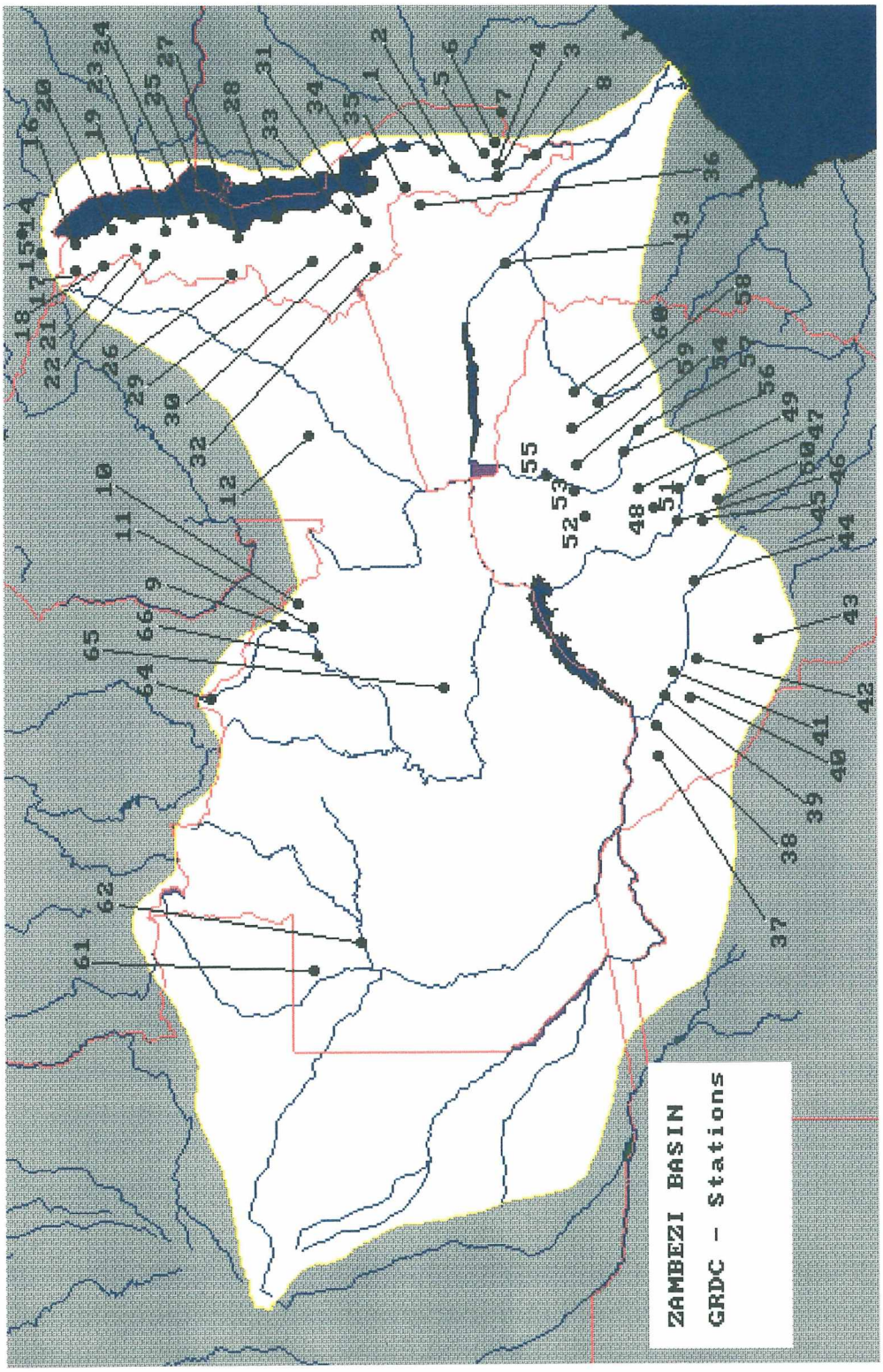

CONGO at BRAZZAVILLE
Subregion: ZAIRE
70000
60000
50000
40000
30000
20000
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1971 - 1983
maximum
minimum
mean


OUBANGUI at BANGUI
GRDC-No.: 1749100
Drainage area: 500000 km²
runoff (mm)
discharge (m³/s)
30
25
20
15
10
5
0
8000
7000
6000
5000
4000
3000
2000
1000
1911
1918
1925
1932
1939
1946
1953
1960
1967
1974
1911 - 1975
runoff
av. discharge/year


OUBANGUI at BANGUI
Subregion: ZAIRE
14000
12000
10000
8000
6000
4000
2000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1911 - 1975
maximum
minimum
mean


SANGHA at SALO
GRDC-No.: 1748500
Drainage area: 68300 km²
runoff (mm)
discharge (m³/s)
0
10
20
30
40
200
400
600
800
1000
1200
1953
1960
1967
1974
1981
1988
1953 - 1988
runoff
av. discharge/year


SANGHA at SALO
Subregion: ZAIRE
2500
2000
1500
1000
500
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1953 - 1988
maximum
minimum
mean


ZAMBEZI BASIN
GRDC - Stations

GLOBAL RUNOFF DATA CENTRE (GRDC)
20 LARGEST RIVERS

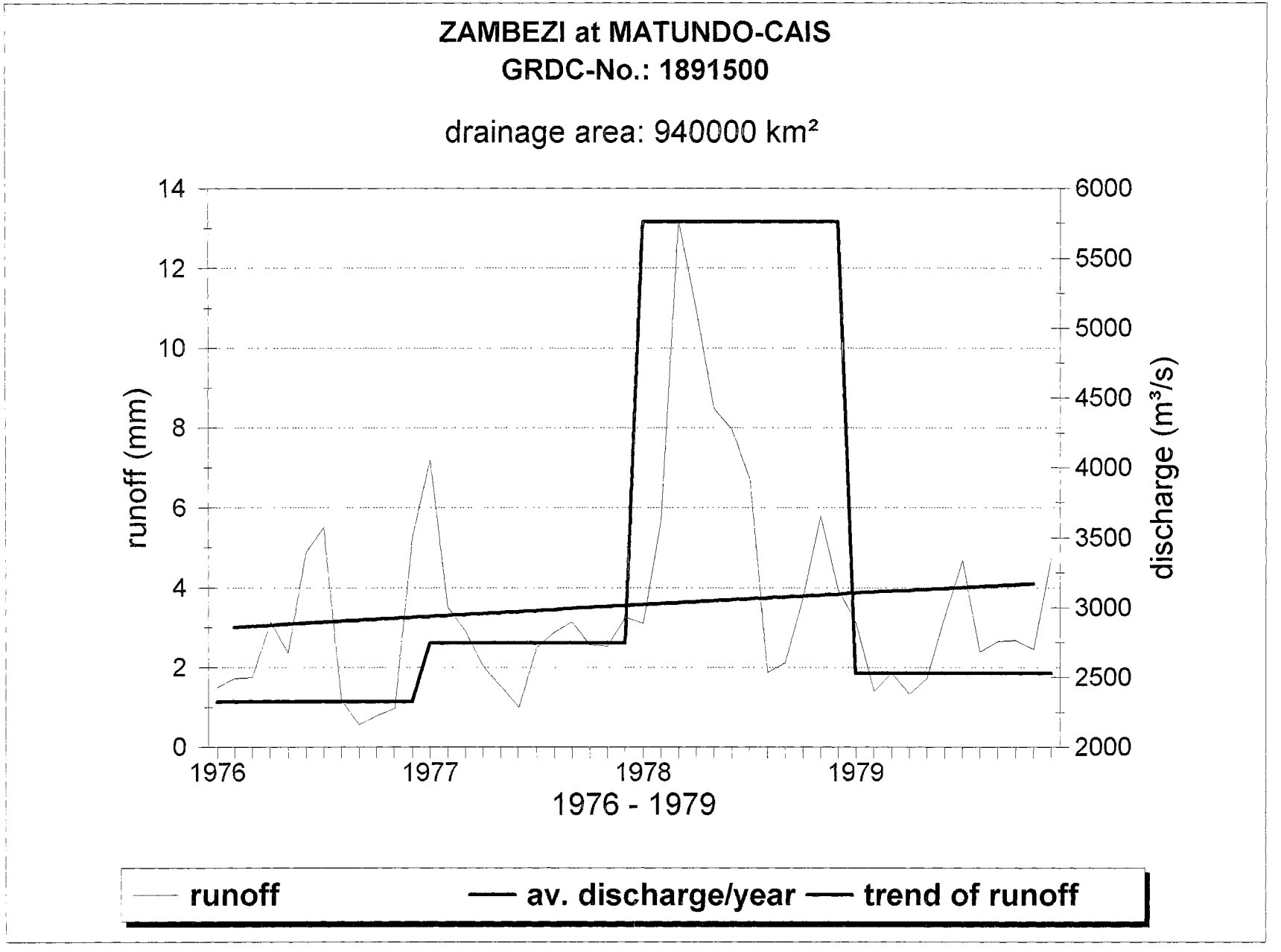
	ZAMBEZI							table 1
No.	River	Station	Area (km²	Latitude	Longitud	first rec.	last rec.	day/mont
1	Shire	Liwonde	130200	1507S	3520E	1 1965	12 1984	M
2	Shire	Matope	133700	1539S	3492E	11 1985	10 1986	D
3	Shire	Chikwawa-Mitole	138600	1603S	3481E	11 1985	10 1986	D
4	Mwamphanzi	Mpokonyola	311	1605S	3487E	1 1978	10 1983	D
5	Chisombezi	Midima Road	76.4	1585S	3520E	11 1985	10 1986	D
6	Luchenza	Luchenza	483	1600S	3530E	11 1985	10 1986	D
7	Ruo	M1-Roadbridge	193	1608S	3573E	11 1985	10 1986	D
8	Shire	Chiromo	149500	1655S	3513E	1 1953	10 1981	M
9	Kafue	Wusakili	9088	1288S	2825E	1 1976	12 1979	M
10	Baluba	Baluba	339	1298S	2827E	10 1978	9 1981	D
11	Kapulafuta	Miputu Hills	4817	1330S	2822E	10 1978	8 1981	D
12	Lusiwasi	Masase	995	1322S	3103E	10 1978	9 1981	D
12	Lusiwasi	Masase	995	1322S	3103E	1 1980	12 1984	M
13	Zambeze	Matundo-Cais	940000	1615S	3358E	1 1976	12 1979	M
14	Kiwira	Kiwira		900S	3400E	1 1973	12 1974	M
15	Lufirio	Ipinga	1425	932S	3392E	1 1978	12 1980	D
16	Lufira	Mwaulambo	1410	981S	3386E	1 1978	10 1983	D
17	Kalenge	Chipwera	83.4	978S	3343E	11 1985	10 1986	D
18	Lufira	Chilanga	770	991S	3343E	11 1985	10 1986	D
19	North Rukuru	Mwakimeme	1860	995S	3380E	11 1985	10 1986	D
20	Wovwe	Kapiyira	313	1032S	3408E	11 1985	10 1986	D
21	North Rumphi	South Manombo	683	1069S	3418E	1 1978	10 1983	D
22	Runyina	Mjuma	602	1097S	3365E	11 1985	10 1986	D
23	Chelinda	Rumphi Boma	476	1103S	3386E	11 1985	10 1986	D
24	Limphasa	Timbiri	261	1156S	3413E	11 1985	10 1986	D
25	Lweya	Majikapotwe	2420	1179S	3420E	11 1985	10 1986	D
26	South Rukuru	Chimsewezo	958	1212S	3342E	11 1985	10 1986	D
26	South Rukuru	Chimsewezo	958	1212S	3342E	1 1965	12 1984	M
27	Dwambazi	Nthanda	778	1223S	3400E	11 1985	10 1986	D
28	Bua	S53-Roadbridge	10600	1279S	3418E	11 1985	10 1986	D
29	Bua	Old Bua Bridge	6970	1329S	3353E	11 1985	10 1986	D
30	Lingadzi	M1-Roadbridge	928	1395S	3377E	11 1985	10 1986	D
31	Lilongwe	Old Town Bridge	1870	1400S	3377E	1 1978	10 1986	D

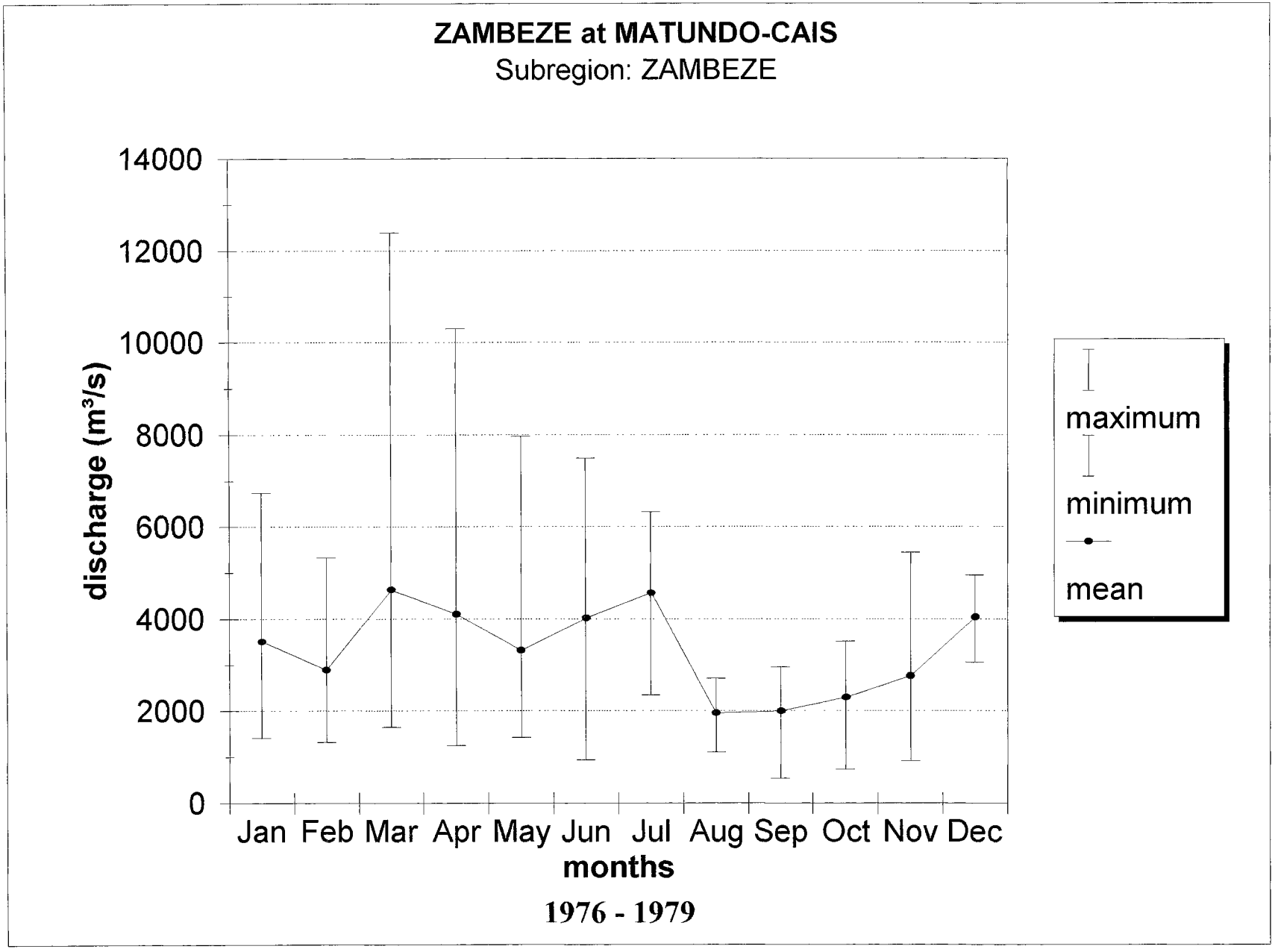
GLOBAL RUNOFF DATA CENTRE (GRDC)
20 LARGEST RIVERS

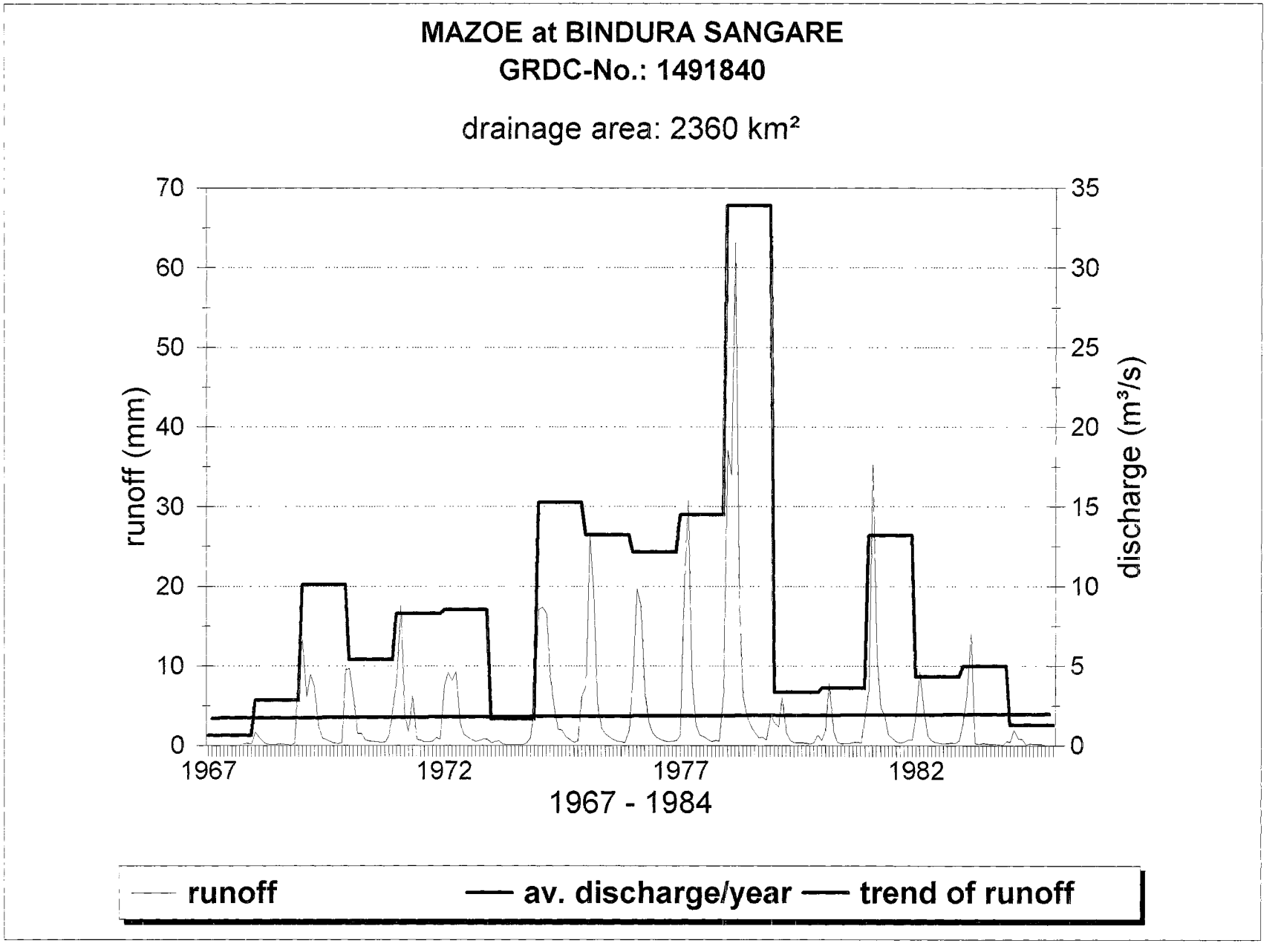
	ZAMBESI							table2
No.	River	Station	Area (km²	Latitude	Longitud	first rec.	last rec.	day/mont
32	Lilongwe	Malingunde	763	1417S	3366E	11 1985	10 1986	D
33	Lilongwe	Nkwenembela	4940	1378S	3432E	11 1985	10 1986	D
34	Linthipe	Malapa	2930	1382S	3435E	11 1985	10 1986	D
34	Linthipe	Malapa	2930	1382S	3435E	3 1975	12 1984	M
35	Nkhande	Thobola	1.89	1469S	3459E	11 1985	10 1986	D
36	Mpamadzi	Gumbu	7.03	1483S	3463E	11 1985	10 1986	D
37	Deka	Gourlay Block Flume	2040	1838S	2632E	10 1973	9 1980	M
38	Lukosi	Victoria Falls Road Flume	1300	1840S	2660E	10 1969	9 1980	M
39	Gwaai	Kamativi G/w	38600	1837S	2705E	10 1955	2 1984	M
40	Gwaai	Dahlia Control Section	21000	1860S	2717E	10 1966	9 1980	M
41	Kana	Japiwa Dip G/w	1370	1857S	2755E	10 1965	9 1980	M
42	Bubi	Lupane G/w	4080	1895S	2777E	10 1964	9 1980	M
43	Khami	Porter G/w	1410	1985S	2802E	10 1966	9 1980	M
44	Shangani	Sir G.Huggins Bridge Flume	5900	1892S	2887E	10 1960	9 1980	M
45	Que Que	Cactus Poort Dam U/s G/w	1217	1907S	2982E	10 1950	9 1980	M
45	Que Que	Cactus Poort Dam D/s G/w	1250	1905S	2978E	10 1960	9 1980	M
46	Umniati	Power Station Weir	5890	1865S	2978E	10 1949	9 1980	M
47	Sebakwe	Sebakwe Dam D/s G/w	2642	1903S	3037E	10 1954	9 1980	M
48	Umsweswe	Claw Dam U/s Flume	2990	1845S	2987E	10 1974	9 1980	M
49	Umfuli	Twyford Weir	5180	1812S	3022E	10 1950	9 1979	M
50	Sebakwe	Dutchman's Pool Dam D/s G/w	4170	1885S	2982E	10 1954	9 1980	M
51	Umniati	Dyke G/w	2630	1882S	3032E	10 1960	9 1980	M
52	Angwa	Chengu Farm	656	1717S	2997E	10 1975	9 1980	M
53	Hunyani	U/s Maquadzi Confluence	1730	1710S	3032E	10 1971	9 1980	M
54	Maquadsi	U/s Hunyani Confluence	6110	1708S	3030E	10 1971	9 1980	M
55	Hunyani	Mangula Mine Weir	7900	1695S	3035E	10 1964	9 1984	M
56	Hunyani	Hunyani Poort Dam U/s G/w	2220	1788S	3077E	10 1957	9 1980	M
57	Hunyani	Prince Edward Dam D/s G/w	793	1798S	3107E	10 1964	9 1984	M
58	Umwindsi	Lion's Head G/w	829	1753S	3150E	10 1951	9 1980	M
59	Mazoe	Bindura Sangare	2360	1730S	3130E	10 1967	9 1984	M
60	Mazoe	Lion's Den G/w	3300	1728S	3155E	12 1967	9 1984	M
61	Makondu	Chivata Village	3354	1333S	2320E	10 1978	9 1981	D
62	Kabompo	Watopa Pontoon	65792	1402S	2360E	1 1976	12 1979	M

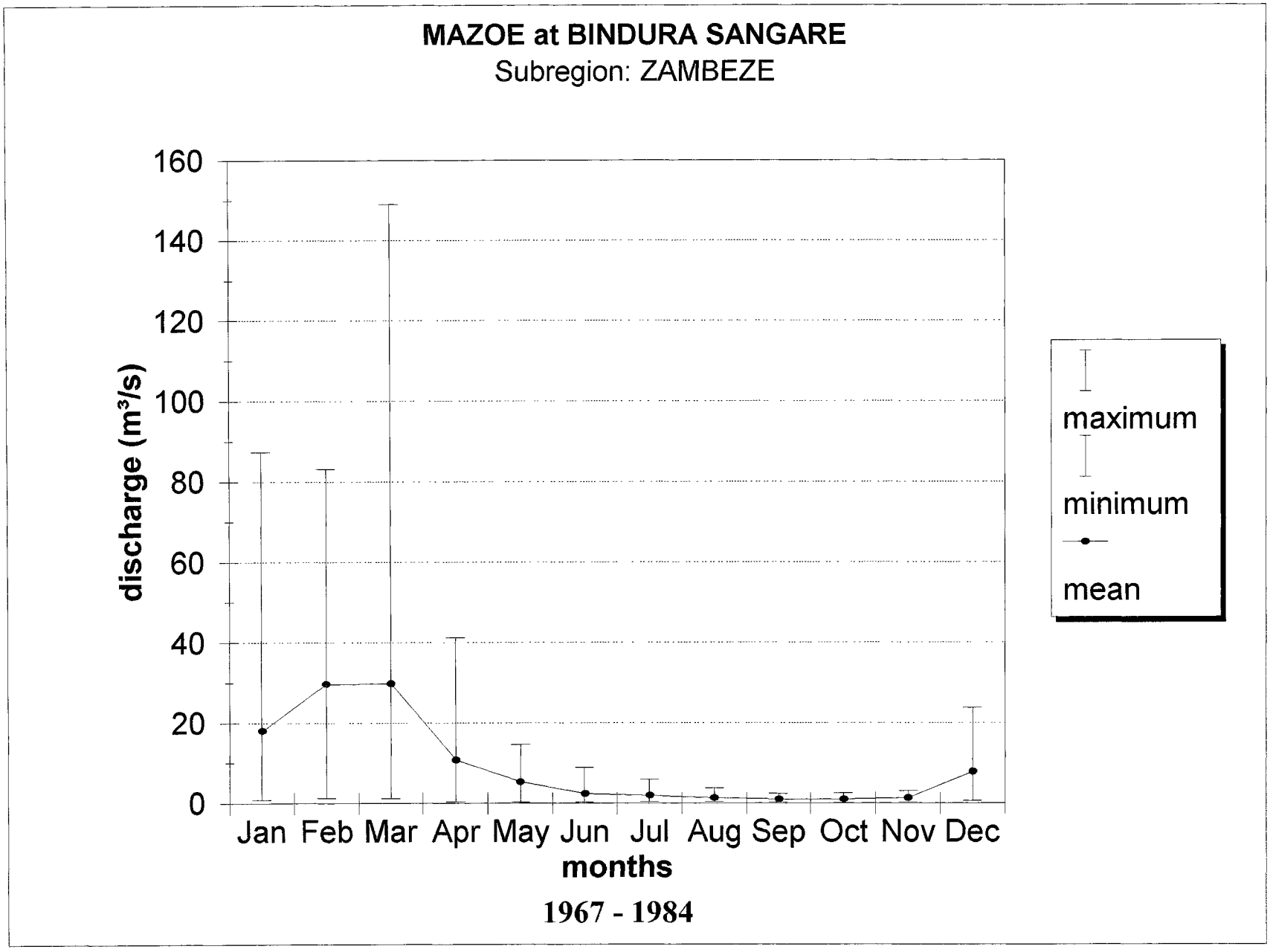
GLOBAL RUNOFF DATA CENTRE (GRDC)
20 LARGEST RIVERS

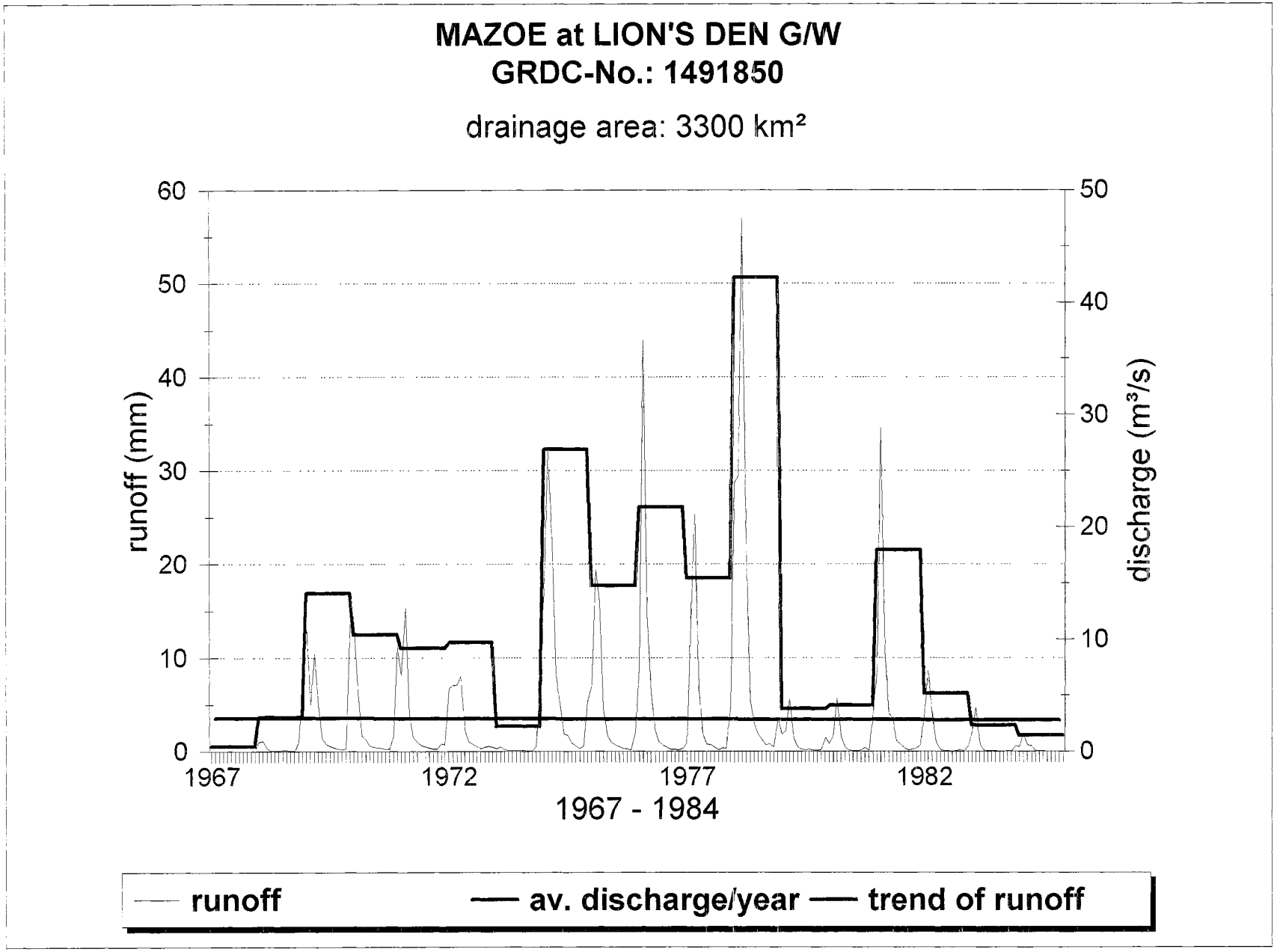
	ZAMBEZI							table3
No.	River	Station	Area (km²	Latitude	Longitud	first rec.	last rec.	day/mont
63	Kabompo	Manyinga Road Bridge				1 1980	12 1984	M
64	Kafue	Kipushi Road	440	1178S	2717E	10 1978	9 1981	D
65	Nangoma	Myooye Bridge	770	1522S	2733E	10 1978	9 1981	D
66	Kafue	Nduben	18726	1340S	2782E	1 1980	12 1984	M

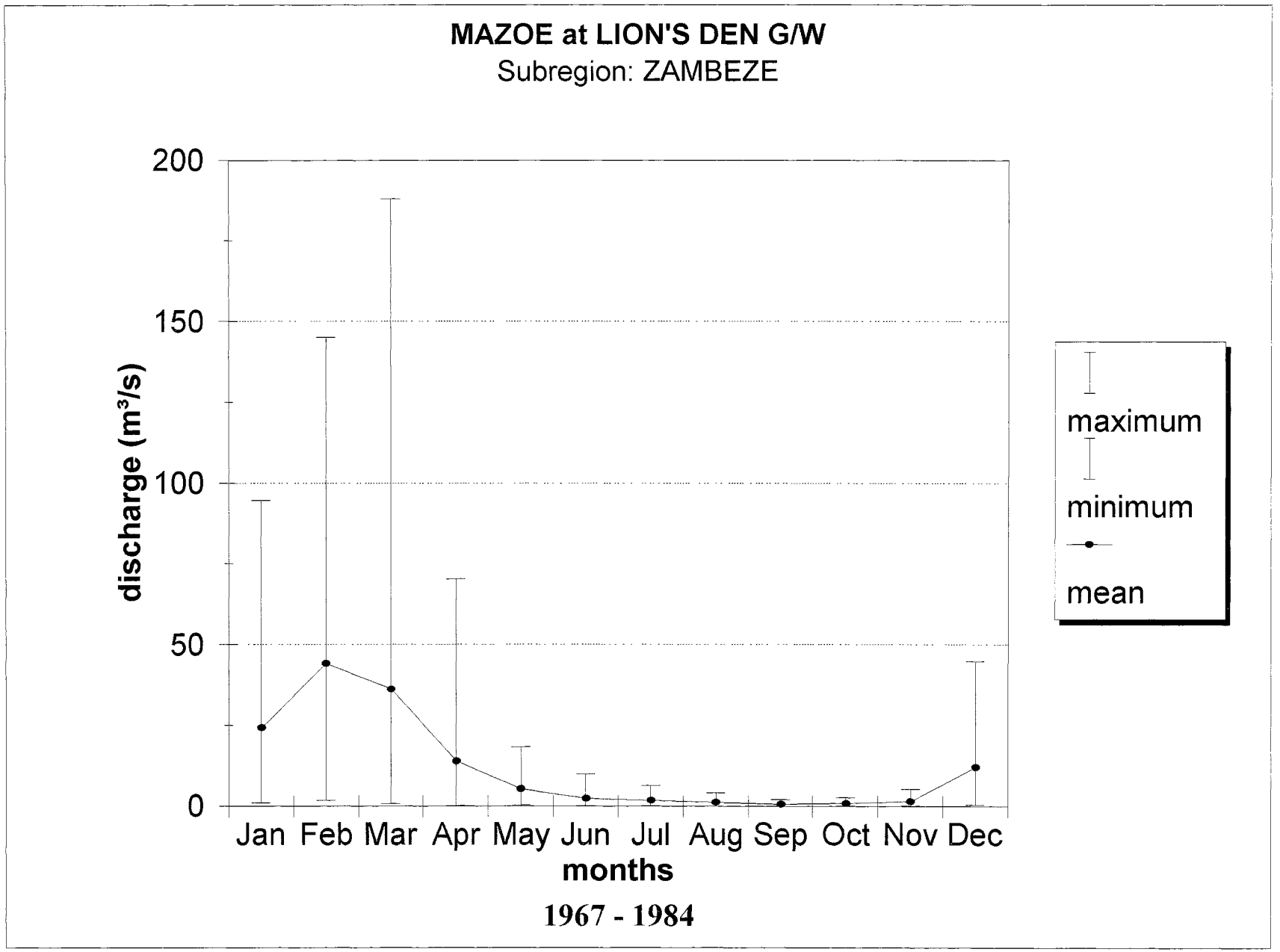

ZAMBEZI at MATUNDO-CAIS
GRDC-No.: 1891500
drainage area: 940000 km²
runoff (mm)
discharge (m³/s)
0
2
4
6
8
10
12
14
2000
2500
3000
3500
4000
4500
5000
5500
6000
1976
1977
1978
1979
1976 - 1979
runoff
av. discharge/year
trend of runoff


ZAMBEZE at MATUNDO-CAIS
Subregion: ZAMBEZE
14000
12000
10000
8000
6000
4000
2000
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
maximum
minimum
mean
1976 - 1979


MAZOE at BINDURA SANGARE
GRDC-No.: 1491840
drainage area: 2360 km²
runoff (mm)
discharge (m³/s)
70
60
50
40
30
20
10
0
35
30
25
20
15
10
5
0
1967
1972
1977
1982
1967 - 1984
runoff
av. discharge/year
trend of runoff


MAZOE at BINDURA SANGARE
Subregion: ZAMBEZE
160
140
120
100
80
60
40
20
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
maximum
minimum
mean
1967 - 1984


MAZOE at LION'S DEN G/W
GRDC-No.: 1491850
drainage area: 3300 km²
runoff (mm)
discharge (m³/s)
60
50
40
30
20
10
0
50
40
30
20
10
0
1967
1972
1977
1982
1967 - 1984
runoff
av. discharge/year
trend of runoff


MAZOE at LION'S DEN G/W
Subregion: ZAMBEZE
200
150
100
50
0
discharge (m³/s)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
months
1967 - 1984
maximum
minimum
mean

Reference of GRDC-Reports

Report No. 1 May 1993	Second Workshop on the Global Runoff Data Centre, Koblenz, Germany, 15 - 17 June, 1992
Report No. 2 May 1993	Dokumentation bestehender Algorithmen zur Übertragung von Abflußwerten auf Gitternetze. (Incl. abstract in English by GRDC: Dokumentation of existing algorithms for transformation of runoff data to grid cells). G. C. Wollenweber
Report No. 3 June 1993	GRDC - Status Report 1992
Report No. 4 June 1994	GRDC - Status Report 1993
Report No. 5 November 1994	Hydrological Regimes of the Largest Rivers of the World - A Compilation of the GRDC Database