



**WATER RESOURCES**  
**OF**  
**THE BEGA VALLEY**

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WATER RESOURCES OF THE BEGA VALLEY

PREFACE

BY THE N.S.W. MINISTER FOR CONSERVATION

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In accordance with the policy of the New South Wales Liberal-Country Party Government announced prior to the May 1965 State Elections, I recently directed the Water Conservation and Irrigation Commission of New South Wales to undertake a comprehensive valley survey of the State's water resources as a prerequisite to the formulation of a balanced and soundly-based programme of water conservation.

The survey will be the largest and most comprehensive study of water resources ever undertaken in Australia. It will embrace thirty major river valleys of the State and will cover all the main aspects of their physiography, meteorology and water resources - both surface and underground - together with a review of current and possible future water requirements.

As it will be some time before the whole survey can be completed, it has been decided to prepare and issue progressively separate reports covering the water resources of the individual river valleys. This report on the Water Resources of the Bega River Valley is the first to be completed.



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# WATER RESOURCES OF THE BEGA VALLEY

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## WATER RESOURCES OF THE BEGA VALLEY

### 1. INTRODUCTION

With the exception of air, water is the most plentiful, as well as the most essential, resource available to mankind. That there is an abundance of this resource is obvious when it is realised that there are over 320 million cubic miles of water on the earth, particularly as a cubic mile is equal to over a million million gallons of water.

However, the magnitude of this resource must be qualified in so far as usefulness is concerned by awareness that 97.2% of this 320 million cubic miles is in the ocean unfit to drink or for irrigation use, 2% lies frozen in glaciers and over 99.5% of the remaining 0.8% is in the form of underground water.

The true picture is therefore that only a very minor part of this plentiful resource is in a form or locations suitable, or readily available, for consumptive use by man. In addition, as the limited surface water resources are not evenly distributed throughout the world in either location or time, it is essential that this portion of the world's water resources be conserved and effectively used.

The gross water resources available to any country are normally considered to be the amounts of rainfall and snow, which fall on the land, whilst a country's surface water resources are those parts of rainfall and snow which eventually appear as stream flow.

When Australia's estimated average annual rainfall of about  $1\frac{1}{2}$  feet is compared to rainfalls in other parts of the world, it is obvious why Australia is often referred to as the world's driest continent. This estimate of  $1\frac{1}{2}$  feet is comparable with about 2 feet for Africa, Asia and Europe and almost  $4\frac{1}{2}$  feet for South America.

When allowance is made for the amount of rainfall which is lost by the evaporation and transpiration processes and to underground water resources, the comparison of the residuals (surface water resources) is even more unfavourable in so far as Australia is concerned than was indicated by the average rainfall figures.

Australia's average annual surface water resources have been assessed as being equivalent to less than 2 inches of rainfall occurring without loss

over the whole of Australia as against about  $\frac{1}{2}$  foot in Africa, 1 foot in North America, and  $1\frac{1}{2}$  feet in South America.

Another way of emphasising the relative smallness of Australia's surface water resources is to compare the total average annual flow of all Australian rivers with those of some of the world's largest rivers. The total flow has recently been assessed as averaging about 240 million acre feet per annum, which volume is less than half the flow of the American Mississippi River, a quarter of the African Congo River and less than one-twelfth of the mighty Amazon River.

The average annual surface water resources of the Bega Valley have been assessed at about 400,000 acre feet per annum. On a square mile of catchment area basis, these resources are considerably greater than the average values for both Australia and coastal New South Wales. However, in common with other areas of Australia, the annual surface water resources of the Valley exhibit a considerable degree of variability.

## 2. GEOGRAPHICAL FEATURES

The Bega River Valley proper comprises an area of approximately 740 square miles and is drained by two major streams, the Bega and Brogo Rivers, which rise in elevated country over 4,000 feet above sea level some 35 miles west of the coast. (The area of 1100 square miles adopted by the Australian Water Resources Council, in its recent review of Australia's Water Resources, for the Bega Basin includes the Bega River Valley and adjoining small coastal catchments such as Murrah River, Narira Creek and Dignam's Creek).

The Bega or Bemboka River rises in the Kybean Range in the vicinity of Brown Mountain and flows in an easterly direction to the coast. Along its course the Bega River is joined by a number of tributaries draining the southern region of the valley, the principal tributaries being Sandy, Tantawanglo and Candelo Creeks.

The Brogo River, which traverses the northern section of the valley, joins the Bega River near Bega township. The principal tributary of the Brogo River is the Numbuggan or Double Creek.

More than half the Bega Valley can be classified as having mountainous topography with land slopes generally in excess of 15 degrees. In the

lower valley the terrain becomes undulating to hilly having land slopes varying between 3 degrees and 15 degrees. The average elevation of the valley is about 1,200 feet above sea level.

The country rises steeply from the river, and there is very little development of alluvial flats. Some flats occur upstream of Bega but the greatest area lies between Bega and the sea. However, as on many of our coastal streams, much of these major flats have been built up under estuarine conditions.

The major part of the valley is underlain by granite. Some Devonian Strata occur in the northern part of the headwaters of the Brogo River and again in the south-eastern corner near Wolumla. Ancient, heavily metamorphised rocks outcrop between Tathra and Jella Jellat from where they extend northwards in a narrow strip along the coast.

The basic soil types of the Bega Valley are of granitic or sedimentary origin with isolated pockets of basaltic soils. Much of the soil in the uplands of the valley is characterised by low fertility and these upland areas are covered by extensive forests of natural hardwood timbers. In the lowlands, soils are moderately fertile and support extensive pastures.

The principal features of the Bega Valley river system are shown in Figure 1, whilst land slopes and geological formations are shown in Figures 2 and 3.

### 3. GROUNDWATER POTENTIAL

Quite a number of bores have been constructed in the granite, those on topographically good sites being almost invariably successful. The water quality is usually quite good (less than 60 parts per hundred thousand dissolved solids) and yields range up to and in some cases in excess of 1,000 gallons per hour.

Both the Devonian and the older Ordovician rocks could be expected to yield useful stock supplies, but as far as is known, there are no bores in these strata, mainly because much of the country underlain by them is undeveloped.

Some irrigation supplies should be obtainable from wells in the alluvial flats, but in many cases it seems likely that larger yield could be obtained from the gravels and sands forming the bed load of the rivers.

Where the river is tidal, the adjacent flats are almost certainly of estuarine origin and it is doubtful whether the groundwater would be suitable in quality for irrigation.

Some bores in granite yield supplies suitable for limited irrigation (say 4 or 5 acres) but there is some doubt as to the long term capacity of such bores, as the high relief suggests that the water table could fluctuate seasonably as much as 20 to 30 feet.

The Bega Town supply is obtained from a screen in the bed load of the river and this source appears to have a greater potential than groundwater in the alluvial flats.

#### 4. CLIMATIC FEATURES

Rainfall. The general distribution of rainfall in the Bega Valley is controlled to a large extent by orographic effects. There is a rain shadow in the centre of the valley but otherwise average rainfall tends to increase with increasing elevation. Highest annual average rainfall totals are of the order of 50 inches and occur on the high ground above the head waters of both the Bega and Brogo Rivers. The driest area is near the junction of the Bega River and Candelo Creek where the yearly average is about 25 inches.

Rainfall is fairly uniformly distributed throughout the year. Summer is the wettest season but only about 30 percent of the annual total falls in this season whilst the driest season, Winter, contributes about 18 percent of the annual total on the average.

Very heavy storm rainfalls may occur in the valley when an active depression is centred off the New South Wales coast between Sydney and the mouth of the Bega River. Under these conditions heavy falls occur at most stations in the valley, the average frequency being about twice a year. The highest falls recorded in 24 hours to 9 a.m. are 18.58 inches at Candelo and 17.88 inches at Bega. Both of these falls resulted from the coastal depression of 26th-27th February, 1919.

Monthly totals of the order of 20 inches or more have been recorded at all stations in the valley. These totals are most common in the summer months but have occurred in all seasons. The highest monthly total on record is 28.77 inches at Bega in February, 1919 whilst at the same station in June, 1891 a total of 27.14 inches was recorded for the month.

Monthly and annual rainfall statistics for Bega, Bemboka, Kameruka, Candelo, Cobargo, Mt. Darragh, Pambula and Nimmitabel are given at Appendices 1 to 8 respectively.

The tables at Appendix 9 show, on a monthly and annual basis, for Bega, Bemboka, Kameruka, Candelo, Mt. Darragh and Nimmitabel, the following data:

- (i) the maximum and minimum rainfalls and,
- (ii) rainfall amounts corresponding to probabilities of occurrence of 10%, 30%, 50%, 70% and 90%.

A probability of occurrence of 50%, that is, the rainfall most likely to occur, is termed the median rainfall. Isohyets of median rainfall over the Bega Valley for each month from January to December are shown at Figures 4 to 15 respectively. The distribution of annual median rainfall over the Bega Valley is shown at Figure 16.

Dry spells occur fairly frequently; during ten percent of seasons rainfall totals are less than the following:

Bega:           Spring - 2.6 inches, Summer - 3.2 inches, Autumn - 2.5 inches and Winter - 2.4 inches.

Candelo:       Spring - 2.4 inches, Summer - 3.2 inches, Autumn - 2.3 inches and Winter - 1.8 inches.

These dry spells frequently continue into a second season and at Bega on an average of once every ten years the Summer-Autumn rainfall total is less than 10 inches, in Autumn-Winter less than 7.5 inches, in Winter-Spring less than 7 inches and in Spring-Summer less than 8 inches.

The lowest rainfalls in any month, shown in the tables at Appendix 9, do not indicate the severity of experienced dry spells over periods greater than one month. Minimum recorded rainfalls for periods up to twelve months for Bega, Candelo and Nimmitabel are shown in the tables at Appendix 10. These tables indicate the minimum cumulative rainfalls, commencing in any



month of the year and continuing for up to twelve months, which have occurred at the selected rainfall stations.

Temperature. Temperature measurements are available for only one station in the Valley, namely Bega. This station may be taken as representative of lower parts of the valley whilst Nimmitabel, which is located less than 10 miles from the western boundary of the valley can be taken as approximately representative of the more elevated section. Temperature data for these two stations are given in the following tables.

TABLE 1  
BEGA (altitude 50 feet)  
Temperature (period 29 years)

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
Average daily maximum	81.2	81.6	79.1	73.9	68.2	63.4	62.9	65.7	70.0	73.9	76.1	79.3	72.9
Average daily minimum	57.3	57.6	54.4	48.2	41.2	36.3	34.5	36.6	41.1	46.5	50.9	55.5	46.7
Average daily mean	69.2	69.6	66.8	61.0	54.7	49.9	48.7	51.1	55.5	60.2	63.5	67.4	59.8
Extreme highest on record 116.5						Extreme lowest on record 20.0							

TABLE 2  
NIMMITABEL (altitude 3500 feet)  
Temperature (Period 29 years)

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
Average daily maximum	72.7	73.1	67.8	59.4	52.5	46.5	45.6	49.0	54.6	60.8	66.1	70.4	59.9
Average daily minimum	47.3	48.0	43.8	38.4	33.2	29.5	28.5	29.4	33.3	37.7	41.5	45.4	38.0
Average daily mean	60.0	60.6	55.8	48.9	42.8	38.0	37.1	39.2	44.0	49.3	53.8	57.9	49.0
Extreme highest on record 100.0						Extreme lowest on record 12.0							

(NOTE: All temperatures in °F)

From these tables it can be seen that there is a graduation in temperature from mild to warm in the lower valley to much colder conditions in the higher country.

Because of its geographical position very hot conditions can develop in summer when northwesterly winds blow from the centre of the Australian continent over the Great Dividing Range and down into the Bega Valley. Already high temperatures are further elevated by the "foehn" effect as the air moves down into the lower parts of the valley. Under these conditions temperatures in the lower valley may rise well above 100°F, the highest on record at Bega being over 116°F.

Frosts Frosts occur in all parts of the valley but only rarely in the immediate vicinity of the coast. They are more frequent in valleys of the hinterland, especially in the more elevated areas. On the higher ground the air temperature falls below freezing regularly at night during the three winter months. Frosts can also occur at any time during spring and autumn and occasionally even in summer.

At Bega the average date of the first occurrence of an air temperature of 36°F or lower is the beginning of May while the last occurrence is, on the average, early in October. The earliest and latest dates on record at Bega are 21st January and 22nd November respectively.

Sunshine. Measurements of sunshine duration have not been made in the Bega Valley and the following table gives an estimation of duration of sunshine at Bega based on records of cloud cover at that station.

TABLE 3

Average Duration of Bright Sunshine - Bega.

(In Hours per Day)

JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
8.4	7.3	7.2	6.1	5.9	5.3	6.0	6.9	7.3	7.6	8.0	8.5	7.2

Evaporation. No evaporation measurements have been made in the Bega Valley, the nearest representative stations being Canberra and Sydney. The following table gives estimated average monthly and yearly evaporation (from a sunken pan) for the valley together with an estimate of the standard deviation.

TABLE 4

Estimated Average Monthly and Annual Evaporation in Inches  
for the Bega Valley (based on the Australian Sunken Tank)

MONTH	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
Average	5.0	4.0	3.6	2.5	1.8	1.3	1.3	1.8	2.5	3.8	4.8	5.0	37.4
Standard Deviation	0.7	0.7	0.7	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.6	0.8	2.7

Strong Winds. Winds over the Bega Valley are mainly only light or moderate but strong winds and squalls do occur occasionally. They occur usually in association with one of the three following situations.

(i) A strong westerly gradient over the valley, associated with a depression south of Gabo Island.

(ii) A strong east or south-easterly gradient over the valley, associated with a vigorous depression off the central New South Wales coast.

(iii) In association with thunderstorms.

Strong westerlies affect the entire valley with mean wind speeds reaching 40 miles per hour at times. The strong east to south-easterlies may reach speeds as high as 50 m.p.h. about the coast but usually moderate quickly as they move inland.

The strongest gusts occur with thunderstorms and these can exceed 70 m.p.h. The following table gives an estimate of maximum wind gusts which can be expected to occur in the valley with various return periods.

TABLE 5

Wind Gusts Expected in the Bega Valley  
with various return periods

Return Period (Years)	10	20	50	100
Estimated Maximum Wind Gust (m.p.h.)	85	90	100	105

5. STREAM GAUGING STATIONS

Streamflow is the component of precipitation which manifests itself as surface flows in rivers and streams. It is the most important element for

study in water resources investigations as it governs the economic and engineering aspects of schemes for irrigation development, town and country water supply and hydro-electric generation. It is therefore necessary to collect adequate records of these flows to provide the necessary basic data for proper appraisal of any such proposals.

These flows are obtained by establishing gauging stations on the various streams in a valley, at which records of river heights are obtained and flows are measured over a range of heights. Using these height and flow measurements, the stream flows are then calculated.

The measurement of stream flows in the Bega Valley was commenced in 1924 when the Water Conservation and Irrigation Commission established gauging stations on the Georges, Rutherford and Tantawanglo Creeks (tributaries of the Bega River rising in the higher elevated country). These stations were maintained until 1931 when, as an economy measure necessitated by the Depression, these, as well as many other gauging stations throughout the State, were discontinued.

No stream flows were measured in the Bega Valley after 1931, until a new gauging station was established on the Tantawanglo Creek in 1939 which was followed in 1943 by the establishment of a station on the Bega (Bemboka) River at Moran's Crossing and the re-establishment of the original Georges and Rutherford Creek stations in 1948.

At the present time the Water Conservation and Irrigation Commission is operating 8 gauging stations so located as to measure the runoff from over half the Bega Valley and to provide reasonable data for use in investigation of water resources proposals.

The existing density of gauging stations in the Bega Valley (equivalent to about 11 per 1,000 square miles) is almost 3 times the present density for Coastal New South Wales, about 10 times the New South Wales density and almost 30 times the Australian density. It can also be compared with the American density of less than 3 per 1,000 square miles.

Notwithstanding this favourable density for the Bega Valley, the Commission is planning to instal an additional 3 stations in 1966 in the lower valley. In addition, proposals are in hand for improvement of the

standing of river level recording at more important stations in the valley.

The locations of all existing or discontinued gauging stations in the Bega Valley are shown on Figure 17 and relevant details concerning each station are given in Table 6.

TABLE 6

Stream	Station	Catchment Square Miles	Type of Gauge	Period of Operation
Bonar Creek	Diversion Weir	1.3	Pressure Recorder	1954 to date
Georges Creek	Steeple Flat*	13.9	Pressure Recorder	(1924 to 1931 (1952 to 1961
Rutherford Ck.	Solid Cutting	6	Float Recorder	(1924 to 1931 (1948 to date
Nunnock River	Dam Site*	7.4	Float Recorder	1954 to 1963
Bemboka River	Moran's Crossing	149	Pressure Recorder	1943 to date
Tartawanglo Ck.	Dam Site	34	Pressure Recorder	(1924 to 1931 (1948 to date
Tartawanglo Ck.	Sunnyside*	55	Staff Gauge	1939 to 1948
McCarthy's Creek	Road Bridge	10.7	Staff Gauge	1960 to date
Tartawanglo Ck.	Tantawanglo	65	Staff Gauge	1943 to date
Candelo Creek	Heffernans*	4	Staff Gauge	1960 to 1963
Candelo Creek	Yurammie	14	Staff Gauge	1963 to date
Yankeys Creek	Bega Swamps*	3	Float Recorder	1954 to 1964
Brogo River	North Brogo	152	Pressure Recorder	1954 to date

\* Discontinued Station.

6. CATCHMENT YIELDS

The recording of streamflow at gauging stations has provided a considerable volume of information for determination of water yield within the Bega Valley. The yield of a catchment is related to the amount of precipitation, type of vegetation, topography, and size of a catchment.

Over the period of 22 years commencing in 1944, the average flow of the Bega (Bemboka) River at Moran's Crossing has been 147,300 acre feet per year equivalent to an average rate of 198 cusecs (74,000 gallons per minute).

Records of stream flow for the North Brogo and Tantawanglo gauging stations indicate that the average annual runoffs at these locations have been at the rates of 263 cusecs (98,000 gallons per minute) and 78 cusecs (29,000 gallons per minute) respectively during the periods given in Table 6.

For the purpose of comparison, the yields at other selected gauging stations based on available computed records are shown in Table 7, whilst details of monthly maximum, minimum and mean flows for the Rutherford Creek, Moran's Crossing, North Brogo and Tantawanglo gauging stations are tabulated in Appendices 11 to 14.

TABLE 7

Stream	Station	Years of Computed Records	Yield		
			Ac.Ft. /Annum	Cusecs	Gallons /Minute
Bonar Creek	Diversion Weir	8	1,600	2.2	800
Rutherford Creek	Solid Cutting	23	9,200	12.0	4,500
Nunnock River	Dam Site	8	19,600	26.7	10,000
Tantawanglo Creek	Dam Site	17	32,200	44.0	16,500
McCarthy's Creek	Road Bridge	5	10,300	14.1	5,300
Candelo Creek	Yurammie	2	19,300	26.4	9,900
Yankeys Creek	Bega Swamps	4	6,700	9.1	3,400

7. AVERAGE ANNUAL RUNOFF

Due to the lack of continuous long term stream flow records in the Bega Valley the current estimate of the long term average annual surface water resources of the valley is based on approximate rainfall and stream flow correlations with the adjoining Snowy catchment for which stream flow records are available from 1903.

This assessment has indicated that the average annual surface water resources of the Bega Valley are of the order of 400,000 acre feet (110,000 million gallons equivalent to a continuous rate of 206,000 gallons per minute). These resources per square mile of catchment are about three times the average for Coastal New South Wales, about six times the New South Wales average and almost seven times the average for the

Australian mainland.

This volume of annual runoff is equivalent to 27% of the average annual rainfall over the valley and may be compared with the estimated runoff statistics of the adjoining Tuross and Towamba Rivers set out in Table 8.

TABLE 8.

Basin	Catchment in Square Miles	Acre Feet per Annum	Acre Feet per Annum per Square Mile	Percentage Runoff
Bega River	740	400,000	540	27
Tuross River	650	360,000	550	30
Towamba River	400	300,000	750	38

The above table indicates that percentage runoff from the Bega River Basin is slightly less than that occurring from the Tuross River Basin and significantly less than that from the Towamba River Basin. This factor is probably attributable to the relative sizes of the three Basins as percentage runoff in a catchment is in general inversely proportional to the area.

8. VARIABILITY OF STREAM FLOWS

It is important to stress that, as average annual flows include both flood and drought periods, they do not indicate the surface water resources available in any particular year or the extent to which utilisation of a valley's surface water resources is possible without the construction of conservation works.

The Bega Valley stream flow and rainfall records show that there is a high degree of variability in the valley's annual water resources, particularly when the wet seasons after 1949 are compared with those for the period of thirteen consecutive years between 1935 and 1949 of below average rainfalls.

During the flood month of June, 1952, a discharge of 38,500 cusecs (14,500,000 gallons per minute) was recorded on the Bega (Bemboka) River at Moran's Crossing. The total discharge during this month of 170,000 acre feet exceeded the long term average annual discharge.

The most severe sequences of low flow since stream gauging commenced on the Bega (Bemboka) River occurred within the period extending from July, 1944, to June, 1945. In the latter half of 1944 the discharge at Moran's Crossing was less than 2 cusecs (750 gallons per minute) for a total period of 63 days whilst in the months of May and June, 1945, the river completely ceased to flow for nineteen consecutive days.

An extended sequence of low flows occurred on Tantawanglo Creek from the commencement of records in April, 1943, up to the end of 1947. Although the stream did not cease to flow, the discharge at Tantawanglo was less than 5 cusecs (1,875 gallons per minute) for a period of 117 consecutive days during the months of January to May, 1944. During this period the minimum flow recorded was 2 cusecs (750 gallons per minute) and this flow persisted for a period of 24 days.

A comparison of monthly streamflow variations during the period of record at the Moran's Crossing, Tantawanglo School and North Brogo gauging stations is shown on Figure 18. This diagram illustrates the extreme variability of runoff at each location and shows that there is a general similarity in behaviour of streamflow at each gauging station.

A general comparison of streamflow variation at selected gauging stations is given in Table 9. This table shows the maximum, minimum and mean discharges for gauging stations over the period of computed record.



TABLE 9.

Stream	Station	Years of Computed Records	Computed Discharge in Cusecs (Gallons per minute)		
			Maximum	Minimum	Mean
Rutherford Creek	Solid Cutting	23	455 (170,000)	0	12.0 (4,500)
Nunnock River	Dam Site	8	756 (283,000)	1 (375)	26.8 (10,000)
Bemboka River	Moran's Crossing	22	38,500 (14,500,000)	0	198 (74,000)
Tantawanglo Creek	Dam Site	17	16,200 (6,080,000)	2 (750)	44.1 (16,500)
McCarthys Creek	Main Road Bridge	5	360 (136,000)	2 (750)	14.1 (5,300)
Tantawanglo Creek	Tantawanglo School	22	16,200 (6,080,000)	2 (750)	78 (29,000)
Yankeys Creek	Bega Swamps	4	896 (336,000)	0	9.2 (3,400)
Brogo River	North Brogo	11	75,200 (28,200,000)	0	263 (98,000)

9. PERSISTENCE OF STREAM FLOWS

As Bega Valley stream flows in general persist for extended periods after the cessation of runoff producing rainfall, it appears that the valley has a high groundwater storage capacity which is able to sustain flow in the streams during dry periods for some considerable time without the occurrence of significant rainfall. (There is no geological evidence available which supports a suggestion that Bega Valley flows during dry periods are augmented by percolation of groundwater resulting from earlier snowfalls in the catchments to the west of the Bega Valley).

An indication of the persistence of dry weather flows in the Bega Valley may be gleaned from an examination of flow duration curves, which have been constructed for the Bega River, Brogo River and Tantawanglo Creek.

The duration curve of flow for the Bega (Bemboka) River at Moran's Crossing (Figure 19) is based on 22 years of record commencing in 1943 and indicates the frequencies of flow during that period shown in Table 10.

TABLE 10.

% of Time Flow Equalled or Exceeded	Corresponding Flows	
	Cusecs	Gals/Min.
10	290	109,000
30	110	41,000
50	70	26,000
70	38	14,000
90	18	6,800
95	11	4,100
100	0	0

The duration curve for the Brogo River at North Brogo (Figure 20) is based on a 11 year period of record, commencing in 1954 and indicates the frequencies of flow during that period tabulated in Table 11.

TABLE 11.

% of Time Flow Equalled or Exceeded	Corresponding Flows	
	Cusecs	Gals/Min.
10	420	158,000
30	100	38,000
50	43	16,000
70	24	9,000
90	8	3,000
95	5	1,900
100	0	0

Table 12 indicates the frequencies of flow during the 22 year period of record at Tantawanglo School commencing in 1943. (The Tantawanglo flow duration curve is at Figure 21).

TABLE 12.

% of Time Flow Equalled or Exceeded	Corresponding Flows	
	Cusecs	Gals/Min.
10	133	50,000
30	60	22,000
50	32	12,000
70	17	6,400
90	11	4,100
95	8	3,000
100	2	750

To permit of a more direct comparison of the flow characteristics of the Brogo River, Bega River and Tantawanglo Creek, composite flow duration curves have been plotted and are at Figure 22. These curves are based on the discharge per square mile of catchment for each stream and indicate that the Tantawanglo Creek exhibits the best low flow persistence.

It will be noted that Figure 22 indicates that the Brogo River has the least favourable low characteristics of the three streams considered. This could be attributable to a lesser capacity for groundwater storage on the catchment of that stream.

10. DROUGHT PERIODS.

The term "drought" is somewhat difficult to define but is often applied to a period when the soil moisture is insufficient for the requirements of most crops during the growing season. A shortage of water for domestic, municipal, and industrial use, which arises as a result of below average precipitation, is also commonly regarded as a drought condition. A diminished rate of streamflow, as a result of a decline in precipitation is normally a prime indicator of drought conditions.

A diagram showing annual rainfall recorded at Bega is appended as Figure 23. This diagram indicates that the lowest calendar year rainfall for Bega was 15.79 inches in 1885 with the next lowest of 16.09 inches occurring in 1941. The longest sequence of below average falls occurred from 1936 to 1948 inclusive and this period appears to have constituted

the most critical drought period in recent times for the Bega Valley. Figure 23 indicates that other short sequences of low annual rainfalls have occurred at frequent intervals but these were usually offset by good falls in preceding or following years.

Since regular recording of streamflow on the Bega (Bemboka) River at Moran's Crossing were commenced in 1943, the lowest flow over any twelve monthly period occurred from January to December, 1965, inclusive. The total runoff in this period was 23,300 acre feet (only about one sixth of the long term average annual flow) and the average discharge over the period was 32 cusecs (12,000 gallons per minute).

The lowest twelve monthly flow recorded on Tantawanglo Creek occurred from November 1945 to October, 1946, when the total flow at Tantawanglo School was 10,000 acre feet or only about 20% of the annual average. The average discharge over the period was 14 cusecs (5,200 gallons per minute) and the lowest flow recorded at the School was 4 cusecs (1,500 gallons per minute).

No records are available on the Brogo River during the drought sequence from 1936 to 1948. However, since commencement of recordings on that stream in 1954, the lowest twelve monthly flow at the North Brogo gauging station occurred in the period from January to December, 1965, when the total was 14,500 acre feet or about 7% of the annual average. The average discharge over the period was 20 cusecs (7,500 gallons per minute) and the minimum flow recorded was 1 cusec (375 gallons per minute). During January, 1955, however, the river ceased to flow at North Brogo for a period of seven days.

#### 11. THE 1964-65 DROUGHT

Since December, 1964, a period of extremely low rainfall has been experienced over the Bega Valley. Despite the approximately average rainfall in October 1965, the average catchment rainfall for the twelve months ending November, 1965, has been assessed as about 19 inches, which is approximately half the average annual fall of 37 inches and approaches the minimum calendar year rainfalls of about 16 inches in 1885 and 1941.

Recorded rainfalls in points at four selected locations in the valley since August, 1964, are set out in Table 13.

TABLE 13.

Period	Bega	Candelo	Bemboka	Steeple Flat
Sept. 1964	86	33	56	148
Oct. 1964	278	321	303	396
Nov. 1964	225	250	245	247
Dec. 1964	172	171	138	149
Jan. 1965	29	18	64	67
Feb. 1965	37	18	21	37
Mar. 1965	19	23	23	20
Apr. 1965	363	93	192	220
May 1965	219	113	54	40
June 1965	74	52	49	73
July 1965	40	37	46	124
Aug. 1965	458	408	352	472
Sept. 1965	93	72	138	232
Oct. 1965	263	171	376	539
Nov. 1965	124	243	158	275
Dec. 1965	240	261	276	208
Jan. 1966	171	216	149	141
TOTALS Sept. 1964- Jan. 1966	2,891	2,500	2,640	3,388
TOTALS Dec. 1964- Nov. 1965	1,891	1,419	1,611	2,248
TOTALS Jan.-Dec. 1965	1,959	1,509	1,749	2,307

The twelve monthly total of about 19 inches at Bega to November, 1965 is the lowest yearly total recorded since 1958/59 when about 18 inches were recorded in the twelve months preceding March, 1959. Lower aggregate twelve monthly falls have been registered at Bega in about ten years of the rainfall records this century, the lowest twelve monthly fall being 12.05 inches from February, 1941, to January, 1942.

It is of interest to note that, despite good rainfalls in April, May, August and October (the August rainfall was more than twice the long term monthly average that month), the 1965 total rainfall for Bega (19.6 inches) is among the lowest recorded for a January to December period. This rainfall is however very substantially higher than for the minimum recorded calendar year rainfall of 15.8 inches which occurred in 1885.

Over the 17 month period from September, 1964 to January, 1966 the estimated average Bega Valley rainfall of 29 inches is only about three-quarters of the mean annual rainfall.

Stream flows in the Bega (Bemboka) River during 1965 have been amongst the lowest since records were commenced in 1943. The total flow at Moran's Crossing for the eight months period from February to September of 14,900 acre feet is compared in Table 14 with recorded flows in previous eight month sequences of low flow.

TABLE 14.

Period	Total Volume in Acre Feet	Average Flow in Gallons/Minute
February 1965 to September 1965	14,900	11,500
August 1958 to March 1959	17,800	13,800
July 1954 to February 1955	15,200	11,700
October 1945 to May 1946	14,400	11,100
July 1944 to February 1945	10,500	8,100

The lowest flow recorded at Moran's Crossing in 1965 has been about 4 cusecs and flows less than this rate have been recorded during only 3 other periods since records commenced in 1943.

On the Brogo River at North Brogo the total flow for the eight months period from January to August 1965 was 4,800 acre feet which is the lowest total eight monthly flow since commencement of the station in 1954. In Table 15, this flow is compared with other recorded eight month sequences of low flow:

TABLE 15.

Period	Total Volume (Acre Feet)	Average Flow (Gallons/Minute)
January 1965 to August 1965	4,800	3,700
July 1958 to February 1959	8,500	6,500
November 1957 to June 1958	9,400	7,200
November 1956 to June 1957	9,600	7,400
June 1954 to January 1955	9,500	7,300

The lowest actual river discharge at North Brogo in 1965 has been about 1 cusec (375 gallons per minute). Flows of less than 1 cusec have occurred during two periods since records commenced in 1954.

The lowest flow recorded at Tantawanglo School during 1965 was 8 cusecs (3,000 gallons per minute). Since 1943 many periods of flows lower than the 1965 minimum flow have been experienced. In Table 16 the most critical eight months flow of 6,700 acre feet (March to October) during 1965 is compared with recorded flows in other eight month periods of dry conditions in the valley.

TABLE 16.

Period	Total Volume (Acre Feet)	Average Flow (Gallons/Minute)
March 1965 to October 1965	6,700	5,100
September 1954 to April 1955	6,200	4,800
April 1947 to November 1947	5,700	4,400
August 1946 to March 1947	6,900	5,300
October 1945 to May 1946	5,200	4,000
August 1944 to March 1945	7,100	5,500
September 1943 to April 1944	5,400	4,200

There was some increase in streamflows during August and early September 1965 as a result of the above average August rainfalls. However there was a general recession in streamflows during the latter half of September and October (particularly in the Brogo River catchment) as is shown by the actual flow measurements set out in Table 17. Whilst rainfall in December was below average it resulted in some increases in streamflow in the Brogo River and Tantawanglo Creek.

TABLE 17.

Stream	Location	Stream Flows					
		12.9.65		27.9.65	6.10.65	11.10.65	
		Cusecs	G.P.M.	Cusecs	Cusecs	Cusecs	G.P.M.
Rutherford	Solid Cutting	3.3	1,240	2.3	2.2	1.2	450
Nunnock	Dam Site	2.8	1,050	2	1.54	1.65	620
Colombo	Above Bemboka Junction	3	1,120	1.6	1.0	1.0	375
Bemboka	Moran's Crossing	33 +	12,400 +	18 +	25.3 +	18.6 +	7,000
Sandy	Above Bemboka Junction	4.1	1,540	2.8	2.2	2.3	860
Tantawanglo	Dam Site	9	3,400	6.2	6	6	2,250
Tantawanglo	School	14	5,200	9	8	8	3,000
Tantawanglo	Above Bega Junction	16	6,000	11.5	9.4	8.8	3,300
McCarthy's	Road Bridge	2	750	1.7	1.56	1.5	560
Candelo	Yurammie	2.6	970	1.2	1.2	1.2	450
Candelo	Above Tantawanglo Junction	3.9	1,460	2.2	1.5	1.54	580
Brogo	North Brogo	36	13,500	13	6.3	6.0	2,250
Double	Above Brogo Junction	6.7	2,500	2.4	1.3	1.17	440
Wolumla	Above Bega Junction	2.7	1,000	1.5	1.0	0.73	270
Brogo	Above Bega Junction	53	19,900	20	10.5	7.4	2,800
Bega	Above Brogo Junction	70	26,200	45	33	25	9,400

+ Flows at Moran's Crossing are influenced by hydro-electric releases.



These measurements show that the flow below Bega, which had risen to 123 cusecs (22% of the long term average flow rate) by 12th September, 1965, had receded to 32 cusecs in a period of about four weeks.

## 12. WATER REQUIREMENTS FOR CURRENT DEVELOPMENT

Present utilisation of stream flows for irrigation within the Bega Valley is principally directed towards the growing of oats, maize, lucerne and improved pastures. For some years prior to 1953 the area authorised for irrigation by license, under the Water Act, was only 40 acres. From 1953 to 1959 there was a steady increase in authorised area to 690 acres involving a total of 48 individual licenses. A further significant increase in authorised area occurred in 1964/65 resulting in an area of some 770 acres being licensed for irrigation as at 30th June, 1965. A graph showing the variation in licensed area and number of licenses from 1945 to date is shown at Figure 24.

In addition to licenses for irrigation purposes a total of 17 licenses permitting a maximum diversion of 5.3 cusecs (2,000 gallons per minute) for town and commercial water supplies were current at the end of June, 1965.

Although no conservation storages of any significant size have been constructed in the valley, limited use of stream flow in the headwaters of the Bega River is being made by the Bega Valley County Council for the generation of hydro-electric power. The two small hydro-electric projects, (situated on Rutherford and George's Creeks) partially control the run-off of about 3% of the valley and provide some regulation of flow in the Bega (Bemboka) River by the daily release of water. The daily diversion by the Power Stations is related to the power requirement of the Bega Valley and the volume of water available for diversion.

The Cochrane or Georges Creek Dam, which provides storage for the project in order to supplement run-of-the-river flow, is an earth filled structure equipped with a concrete spillway and has a maximum storage capacity of approximately 4,300 acre feet at full supply level. Under maximum generating conditions, the combined power output of Georges and Rutherford Creek Scheme is 4,600 Kilowatts corresponding to a peak power station discharge of 40 cusecs. While storage is available in the dams the station supplements low river flow by up to 10,000,000 gallons per day.

On the basis of current development in the Bega Valley, the estimated maximum requirements for irrigation under licenses, riparian rights, water supply and river losses as set out in Table 18 are only about 2% of the average long term flow rate for the valley.

TABLE 18.

Requirement	Cusecs	Gallons/ Minute
Irrigation under license (770 acres at 2 ft. per season)	3.2	1,200
Riparian usage and river losses	2.1	800
Town and Commercial water supplies	5.3	2,000
<b>TOTAL REQUIREMENTS</b>	<b>10.6</b>	<b>4,000</b>

A subdivision of the total water demand into respective tributary basins indicated that stream flow during the period of low flow experienced in 1965 was, in general, more than adequate to meet current pumping requirements along main streams. However, the limited storage available at Cochrane Dam and the continued low flow conditions in Rutherford and Georges Creeks resulted in a severe limitation on the amount of hydro-electric power able to be generated by the Bega Valley power station.

13. POSSIBLE LIMIT OF IRRIGATION DEVELOPMENT

Consideration of available topographic information indicates that, due to the location of suitable soil types and probable pumping costs, most irrigation development in the foreseeable future will probably occur on the river frontage land in the lower reaches of the valley.

A preliminary assessment has indicated that the area of this river frontage land suitable for irrigation is probably in the vicinity of 6,000 acres including some 3,000 acres in areas which front the Bega River in the vicinity of the tidal section which commences some 5 miles below the town of Bega.

The area of river flats suitable for irrigation development along the Brogo River has been tentatively estimated at approximately 1,300 acres, the bulk of which is located in the reach of river between North Brogo and the Bega River Junction. An area of some 1,700 acres of river frontage land

is estimated as probably being suitable for development along the Bega River and tributaries upstream of Bega.

If the whole of this area of 6,000 acres was irrigated, the average water requirements over an irrigation season would be at a rate of the order of 10,000 gallons per minute. Adopting this figure and allowing an arbitrary increase of 50% over the current river requirements for other purposes, the resulting total requirement in an irrigation season would be equivalent to a rate of about 15,000 gallons per minute which, is only about 7% of average flow rate for the Bega Valley.

If such development did occur, it should be possible to provide an assured flow to meet this requirement of 15,000 gallons per minute on the main streams during a repetition of the worst recorded drought sequence by the construction of storages on the Brogo River, Bega River and Tantawanglo Creek. Preliminary analysis has indicated that, if it were possible to locate these storages so as to control the flows of the Brogo River near North Brogo, the Bega River near Bemboka and Tantawanglo Creek near Tantawanglo School, then:

- (a) the total combined storage capacity needed would be less than the capacity of the existing Cochrane Dam;
- (b) natural flows would only need to be supplemented by releases of stored water during about 10% of the time.

The Water Conservation and Irrigation Commission has not as yet undertaken other than preliminary inspections for possible dam sites. However, the topography of the valley indicates that no difficulty should be experienced in locating suitable sites for the construction of small conservation storages which may be required to provide an assured water supply for possible future irrigation development.

#### 14. ACKNOWLEDGEMENT

The Water Conservation and Irrigation Commission wishes to acknowledge the assistance given by the Director, Bureau of Meteorology in providing the Section on Climatic Features, Rainfall Statistical Data and Bega Valley Isohyets.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1882	1.50	0.50	1.50	5.75	4.35	0.25	0.00	3.85	0.00	8.20	2.62	2.80	31.32
1883	3.00	5.70	2.74	5.63	2.01	0.07	0.58	0.15	3.56	5.03	0.70	0.80	29.97
1884	3.15	0.80	1.72	13.59	3.84	1.13	0.54	1.92	No Records				
1885	2.22	3.43	0.98	0.27	0.30	2.84	1.08	0.00	0.56	0.45	1.91	1.75	15.79
1886	3.37	2.14	0.42	1.69	0.31	0.24	1.60	2.03	1.14	3.35	3.18	3.52	22.99
1887	8.15	1.66	1.78	2.37	1.64	6.70	1.21	4.09	0.71	2.61	6.31	4.65	41.88
1888	1.35	1.49	1.83	0.00	0.82	0.72	0.00	1.66	2.82	0.77	0.59	10.00	22.05
1889	3.47	1.93	0.67	0.64	8.92	1.73	1.05	1.43	1.74	2.09	4.46	0.36	28.49
1890	3.57	3.24	14.04	1.27	2.26	4.39	2.99	0.66	4.03	1.36	1.87	1.25	40.93
1891	4.82	1.73	0.99	4.53	0.30	7.14	4.04	3.94	4.12	2.19	3.09	2.89	59.78
1892	1.94	0.61	9.04	1.87	0.65	0.58	0.59	1.57	9.44	7.46	4.87	2.40	41.02
1893	4.24	1.47	9.70	5.80	0.59	0.81	8.53	0.06	0.98	3.58	3.55	7.71	47.02
1894	4.00	2.10	14.06	3.99	0.11	5.27	0.04	0.20	1.57	2.79	0.64	2.14	36.91
1895	6.39	1.68	1.38	0.39	2.67	1.40	0.09	3.81	1.15	0.03	0.00	1.22	20.21
1896	2.43	3.20	1.32	0.00	7.28	7.77	0.28	2.81	1.41	1.29	2.63	1.78	32.20
1897	4.43	9.25	1.78	1.50	0.75	4.59	1.39	1.97	1.21	2.47	0.31	3.08	32.73
1898	0.34	27.36	0.05	0.10	3.38	4.20	0.51	5.30	0.79	1.55	0.24	0.55	44.57
1899	3.69	0.16	0.42	6.03	2.42	5.76	1.78	6.13	1.10	1.01	1.74	0.58	30.82

BEGA MONTHLY RAINFALL STATISTICS  
1882 TO 1965

BEGA MONTHLY RAINFALL STATISTICS

1882 TO 1965

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1900	1.87	0.78	3.36	3.09	17.05	1.82	2.57	0.27	2.33	0.05	2.85	0.80	36.84
1901	1.44	0.47	2.23	2.00	0.11	1.04	1.88	12.86	2.39	2.05	1.85	0.26	28.58
1902	3.66	0.52	2.49	1.28	0.11	2.88	12.32	1.24	1.30	4.03	0.74	6.84	37.41
1903	0.40	0.53	2.74	0.49	1.89	1.98	5.10	2.30	1.76	0.71	1.20	5.63	26.73
1904	1.90	3.30	0.49	2.85	1.09	0.05	4.30	1.17	0.38	0.96	0.31	0.66	17.46
1905	1.36	1.55	1.41	2.52	3.44	1.19	0.89	1.11	0.72	5.83	0.03	1.59	21.60
1906	1.44	0.81	10.38	0.55	1.43	0.30	0.45	4.55	1.50	1.57	1.32	1.87	26.17
1907	3.82	0.93	2.24	0.62	0.77	6.63	0.00	1.36	0.00	0.24	1.23	4.10	21.94
1908	1.34	3.43	0.20	3.09	1.88	0.49	0.61	6.82	2.97	1.08	1.59	0.14	23.64
1909	3.31	5.73	0.27	0.56	0.02	8.51	3.36	0.29	0.59	1.40	0.04	2.35	26.47
1910	10.66	0.37	3.53	0.00	0.07	1.38	3.19	0.15	2.10	1.37	1.73	2.49	27.04
1911	17.00	1.74	7.68	0.30	3.09	1.35	1.20	1.58	1.38	0.52	1.83	2.15	39.82
1912	0.84	1.27	5.50	0.53	2.48	2.90	10.96	0.32	0.65	1.10	3.27	2.06	31.88
1913	1.07	1.52	7.13	3.81	10.39	16.13	0.72	0.10	2.81	5.13	0.76	0.66	50.23
1914	0.71	0.31	26.37	8.28	0.36	0.07	7.99	0.03	7.62	3.40	2.32	4.01	61.47
1915	2.29	0.13	2.49	3.21	0.65	2.19	0.71	1.04	5.74	1.51	0.12	1.37	21.45
1916	2.38	5.39	2.30	2.07	0.39	0.89	1.14	0.78	6.48	7.91	4.00	8.10	41.83
1917	4.61	4.61	1.08	3.06	2.31	3.53	0.23	0.59	2.81	1.00	7.73	1.87	31.05
1918	11.76	2.47	1.14	1.50	0.49	0.44	6.30	0.71	0.61	0.48	1.32	0.64	27.86

BEGA MONTHLY RAINFALL STATISTICS  
1882 TO 1965

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1919	0.20	28.77	0.95	1.65	4.93	0.34	0.43	1.36	1.14	1.01	1.75	11.73	54.26
1920	8.95	0.94	2.22	0.53	0.18	0.48	1.93	1.99	1.59	6.73	1.51	10.25	37.30
1921	1.54	7.77	4.03	3.75	2.68	2.58	0.85	0.25	0.37	2.63	2.64	6.47	35.56
1922	7.78	3.47	0.44	0.70	2.06	3.79	13.97	3.34	5.52	2.63	0.37	1.54	45.61
1923	0.80	0.31	0.00	0.34	0.17	2.52	1.59	0.41	6.48	2.22	2.10	4.78	21.72
1924	3.26	3.43	4.65	3.76	1.27	1.84	1.90	1.04	0.97	0.49	3.63	10.53	36.77
1925	5.02	2.22	1.87	0.49	25.04	4.52	1.60	0.48	0.20	1.79	1.18	0.60	45.01
1926	2.38	0.22	5.59	1.54	2.04	3.01	1.20	0.96	2.05	0.80	0.00	3.06	22.85
1927	2.23	0.45	1.44	1.37	1.97	0.11	1.26	0.04	1.37	4.33	1.57	0.29	19.43
1928	2.45	9.32	13.22	1.12	0.63	13.10	0.15	0.20	0.90	1.11	0.52	0.42	43.14
1929	0.37	10.93	2.41	3.75	0.83	0.22	0.53	5.83	0.65	2.51	6.10	1.58	35.71
1930	0.14	0.91	1.00	0.35	6.97	3.15	1.65	0.40	0.90	4.13	1.03	3.49	24.16
1931	1.90	1.46	3.34	2.72	4.83	1.57	1.31	0.11	1.42	1.57	1.44	0.81	22.48
1932	0.06	1.90	4.47	2.83	2.89	0.27	4.40	4.77	5.04	3.89	2.50	3.12	36.14
1933	5.63	0.24	3.10	2.03	2.56	5.28	2.20	2.61	2.56	3.15	4.63	7.04	41.03
1934	16.30	9.00	0.98	16.12	3.76	5.16	7.63	5.99	1.06	1.56	3.63	1.04	72.19
1935	3.28	7.51	1.02	10.86	0.52	2.59	0.50	0.10	1.77	4.44	3.11	2.28	37.98
1936	2.27	2.78	6.69	2.28	0.91	3.33	2.65	2.21	0.79	0.67	2.17	8.06	34.81

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1937	7.24	1.75	5.01	0.08	0.39	5.31	0.18	1.35	1.22	4.81	0.93	4.76	33.03
1938	4.09	2.62	1.00	0.69	1.09	1.03	1.16	4.38	1.96	2.53	1.92	0.08	22.55
1939	4.15	1.34	3.77	6.14	1.35	0.68	0.32	7.79	0.39	2.13	1.92	0.28	30.26
1940	1.24	0.67	0.23	6.19	1.28	0.67	0.34	0.35	3.12	0.23	1.30	4.30	19.92
1941	4.43	0.94	1.65	1.84	0.55	0.50	0.35	0.35	1.31	1.52	1.26	1.39	16.09
1942	0.39	1.62	5.72	0.17	1.50	0.74	0.61	0.16	0.60	6.66	5.24	0.35	27.76
1943	2.52	0.85	0.33	1.05	3.35	1.08	0.00	4.38	0.99	3.12	1.98	2.34	21.99
1944	1.35	0.09	0.33	2.25	15.41	0.09	0.96	1.46	0.11	1.91	0.54	1.83	26.33
1945	6.08	0.85	0.72	8.70	1.05	4.80	0.77	0.59	0.85	2.19	1.48	2.15	30.23
1946	2.25	3.10	2.39	1.47	1.28	10.88	0.00	0.69	0.68	0.84	3.86	0.96	28.40
1947	0.75	4.94	1.26	7.20	0.21	1.59	0.03	3.57	0.54	0.82	4.75	8.28	33.94
1948	7.88	2.31	0.29	2.34	6.54	2.18	0.06	0.00	0.54	2.65	1.78	3.24	29.81
1949	4.20	2.16	4.82	0.38	3.83	7.64	3.96	0.09	4.58	6.33	5.76	1.87	40.62
1950	5.44	14.90	11.13	5.59	4.36	5.66	4.68	2.89	1.08	6.34	2.34	1.03	65.44
1951	3.43	7.04	0.07	0.46	1.04	9.75	1.06	4.98	6.14	3.01	1.00	1.04	39.02
1952	0.81	1.08	4.55	12.62	3.08	14.71	2.81	2.99	0.45	9.72	5.56	7.14	65.52
1953	3.11	1.12	1.90	0.14	10.21	0.26	0.03	2.60	0.43	3.06	1.45	2.20	26.51
1954	1.78	8.74	0.06	0.35	0.72	1.77	0.53	0.12	0.09	1.86	3.64	1.36	21.02

BEGA MONTHLY RAINFALL STATISTICS  
1882 TO 1965

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1955	1.30	5.02	2.87	0.43	8.23	0.68	0.42	0.62	1.07	2.57	0.40	4.22	27.83
1956	4.20	13.66	8.81	3.22	17.52	11.63	4.71	0.15	1.12	2.32	1.06	1.68	70.08
1957	0.31	3.25	1.67	0.09	0.39	2.67	8.40	8.71	0.90	0.46	0.72	2.56	30.13
1958	4.21	4.02	1.31	0.13	0.54	3.66	1.06	1.17	2.10	1.01	0.46	4.22	23.89
1959	1.07	1.35	5.25	0.91	0.18	3.25	5.40	0.42	1.71	10.39	5.29	3.00	38.25
1960	1.73	1.08	3.57	0.42	1.64	1.09	6.20	1.17	6.15	2.59	1.60	9.88	37.12
1961	2.48	2.31	19.40	1.34	0.19	5.24	5.92	3.67	6.35	1.83	10.66	6.25	65.67
1962	4.07	3.93	1.40	0.86	1.67	0.00	1.07	2.46	7.51	1.48	1.32	5.64	31.41
1963	2.43	3.37	2.48	4.73	10.44	7.54	4.16	3.00	2.04	1.83	3.90	5.97	51.89
1964	0.09	2.30	1.13	9.90	0.94	3.95	0.29	5.68	0.86	2.78	2.25	1.72	31.89
1965	0.29	0.37	0.19	3.63	2.19	0.74	0.40	4.58	0.93	2.63	1.24	2.40	19.59
Mean	3.35	3.47	3.60	2.69	3.06	3.51	2.31	2.16	2.09	2.61	2.32	3.18	34.35
Min.	0.06	0.09	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.03	0.00	0.08	15.79
Max.	17.00	28.77	26.37	16.12	25.04	16.13	13.97	12.86	9.44	9.72	7.73	11.73	72.19

BEGA MONTHLY RAINFALL STATISTICS  
1882 TO 1965



YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
1890	437	369	1216	169	358	320	214	57	298	175	126	112	3851
1891	348	106	26	281	13	2409	260	317	413	196	332	378	5079
1892	308	65	465	146	96	47	22	97	689	977	382	285	3579
1893	417	123	1938	635	100	309	511	16	153	404	705	602	5913
1894	398	361	1330	281	43	326	0	32	151	163	28	179	3292
1895	584	186	103	16	141	96	7	184	183	23	2	87	1612
1896	215	284	93	28	479	556	24	251	121	141	157	320	2669
1897	574	450	146	99	64	353	203	204	174	161	43	323	2794
1898	43	2465	29	8	169	376	17	526	69	181	7	91	3981
1899	250	42	129	668	126	491	271	647	97	115	151	89	3076
1900	251	167	231	311	1386	247	445	49	159	16	281	150	3693
1901	281	78	224	161	25	78	243	1704	236	248	206	72	3556
1902	342	39	198	67	12	34	1192	45	126	363	128	696	3242
1903	38	168	193	89	152	264	342	197	349	211	236	440	2679
1904	293	189	160	235	183	14	196	103	21	222	79	48	1743
1905	210	134	136	183	113	105	19	57	36	478	0	421	1892
1906	58	30	903	10	86	8	18	467	180	192	147	89	2188
1907	572,	138	235	NO RECORDS									

BEMBOKA RAINFALL STATISTICS.

BEMBOKA RAINFALL STATISTICS

YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
1908	187	414	18	274	133	55	16	896	298	57	150	112	2610
1909	284	569	30	0	0	599	139	29	55	175	43	202	2125
1910	1062	109	223	0	0	68	180	0	210	95	89	230	2266
1911	1610	209	616	0	137	160	76	155	235	35	47	212	3492
1912	31	122	467	0	113	223	1147	0	0	111	392	292	2898
1913	99	53	942	309	1112	1077	56	0	267	311	58	20	4304
1914	124	44	1394	360	60	0	482	0	335	168	172	396	3535
1915	71	23	127	128	29	225	55	107	632	77	37	190	1701
1916	320	655	135	105	20	55	210	87	773	1151	201	337	4049
1917	315	190	108	35	182	102	15	33	271	109	619	209	2188
1918	1100	335	56	196	12	36	544	57	100	19	108	33	2596
1919	6	1683	134	148	296	28	33	72	55	128	225	998	3806
1920	764	108	115	108	35	33	115	107	95	511	154	956	3101
1921	170	1021	167	396	126	237	137	49	53	170	289	809	3624
1922	764	256	53	46	73	268	1913	234	347	166	72	142	4334
1923	93	21	0	31	33	222	136	13	826	114	162	552	2203
1924	315	303	202	204	70	60	97	29	60	68	352	886	2646
1925	464	231	158	0	2601	480	209	0	0	153	145	10	4451

YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
1926	223	0	302	342	133	246	67	38	181	36	0	218	1786
1927	342	49	213	427	211	0	0	20	20	369	160	40	1851
1928	200	925	977	19	20	832	62	0	43	35	10	116	3239
1929	32	1696	153	293	48	23	24	535	119	266	583	99	3871
1930	0	189	151	20	438	220	80	61	50	519	11	223	1962
1931	113	35	213	361	365	78	41	8	82	176	217	87	1776
1932	7	165	343	216	253	3	267	374	466	286	499	169	3048
1933	290	21	123	110	204	668	206	96	241	342	500	452	3253
1934	1992	1143	80	606	130	387	858	472	1124	150	327	342	6611
1935	215	851	83	862	0	151	3	22	185	365	226	109	3062
1936	329	339	864	201	23	491	53	162	29	75	31	1093	3690
1937	236	115	429	8	30	468	12	82	112	283	62	468	2305
1938	382	176	16	21	36	16	17	618	150	295	294	37	2058
1939	326	235	360	493	183	88	37	662	4	90	151	35	2664
1940	166	59	24	533	60	39	18	33	370	9	99	248	1658
1941	505	96	225	107	46	31	31	21	144	77	161	68	1512

BEMOKA RAINFALL STATISTICS.

YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
1942	42	334	578	30	89	81	65	7	56	751	702	4	2739
1943	296	98	35	92	394	55	5	386	125	381	216	254	2337
1944	178	0	56	165	1730	2	54	89	9	167	44	95	2589
1945	405	237	104	1129	113	711	79	39	89	248	200	200	3554
1946	185	383	325	130	90	721	0	69	18	64	393	125	2503
1947	53	816	183	526	0	115	5	138	50	54	385	565	2890
1948	330	360	54	120	665	270	4	2	40	335	137	408	2725
1949	336	183	647	42	449	746	235	9	396	206	402	111	3762
1950	464	1104	1341	593	269	335	261	282	66	851	424	200	6190
1951	391	1250	18	41	45	790	44	374	626	290	114	192	4075
1952	72	102	351	1632	226	1933	254	276	0	838	471	453	6608
1953	342	97	65	0	1414	21	0	145	44	184	70	169	2551
1954	278	730	7	36	2	238	14	0	50	220	461	90	2126
1955	166	549	258	74	1027	89	46	25	89	321	44	559	3247
1956	379	1579	871	145	893	1050	353	5	155	206	120	111	5867
1957	42	228	185	14	16	262	796	765	90	140	80	259	2877

BEMOKA RAINFALL STATISTICS

YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
1958	400	639	167	40	68	457	102	88	205	74	170	230	2640
1959	308	167	567	174	7	403	628	36	188	1260	581	408	4727
1960	386	146	375	42	154	53	1066	121	377	216	267	753	3956
1961	309	213	1043	117	7	308	631	266	559	217	1501	658	5829
1962	493	478	163	169	137	0	164	92	793	207	157	846	3699
1963	452	373	384	942	728	457	438	223	191	134	314	780	5416
1964	15	316	126	1125	123	225	41	775	56	303	245	138	3488

YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
1901	151	91	133	140	11	78	176	970	197	229	144	111	2431
1902	504	55	250	82	10	334	967	33	109	303	83	860	3590
1903	47	49	137	74	190	171	337	118	300	112	170	563	2268
1904	332	222	89	182	116	2	229	119	13	101	48	88	1541
1905	221	87	186	290	236	89	77	86	55	452	103	256	2138
1906	35	132	805	35	99	15	36	376	180	155	98	180	2146
1907	514	92	255	88	101	428	0	98	0	42	138	378	2134
1908	186	301	57	229	153	47	26	509	232	85	90	31	1946
1909	317	408	79	17	15	463	151	26	44	111	0	201	1832
1910	530	13	255	0	8	109	150	10	189	132	135	164	1695
1911	902	181	590	54	191	127	100	114	231	128	288	170	3076
1912	41	108	387	22	102	194	783	21	51	38	328	244	2319
1913	148	100	515	304	804	965	48	4	234	420	94	58	3694
1914	67	27	1548	604	28	6	457	0	406	127	158	264	3692
1915	43	76	230	204	29	99	42	130	450	146	34	167	1650
1916	214	461	95	128	28	88	116	68	378	469	218	681	2944
1917	480	142	158	156	296	133	28	64	283	143	518	274	2675
1918	819	290	52	134	31	58	529	156	57	101	159	58	2444

KAMERUKA ESTATE  
RAINFALL STATISTICS

KAMERUKA ESTATE  
RAINFALL STATISTICS.

YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
1919	3	1310	157	156	345	14	33	93	106	78	267	916	3478
1920	667	58	155	84	15	42	148	164	144	493	245	597	2812
1921	161	472	236	362	169	167	47	20	40	222	232	627	2755
1922	431	240	54	58	162	254	1227	239	386	198	46	135	3430
1923	105	51	6	7	16	195	109	39	579	144	190	389	1830
1924	252	268	376	226	82	108	127	59	90	64	333	909	2894
1925	407	177	132	43	2030	353	159	32	19	198	88	93	3731
1926	368	12	344	114	95	234	58	77	145	83	5	146	1681
1927	240	35	138	308	164	5	102	5	73	316	135	43	1564
1928	199	718	861	57	50	675	22	8	61	36	59	52	2798
1929	19	1091	234	256	43	24	12	422	90	228	506	151	3076
1930	26	86	111	39	376	222	112	24	81	486	55	225	1843
1931	178	79	258	155	272	105	75	4	142	116	90	98	1572
1932	9	138	287	229	133	9	252	268	249	209	347	310	2440
1933	328	12	232	114	159	453	167	189	205	221	351	608	3039
1934	1189	652	49	888	175	388	596	339	82	173	254	144	4929
1935	160	644	148	632	0	80	24	12	187	265	253	186	2591
1936	176	274	439	148	45	311	178	199	31	59	161	714	2735

YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
1937	376	141	498	17	56	364	32	122	158	340	178	437	2719
1938	251	249	49	32	115	75	92	383	256	262	251	18	2033
1939	379	167	499	533	177	76	35	648	24	107	321	19	2985
1940	149	68	35	410	111	59	25	33	205	10	112	385	1602
1941	369	60	224	161	14	52	30	48	92	132	119	89	1390
1942	31	182	405	19	100	72	65	20	38	364	718	45	2059
1943	264	70	50	70	181	64	0	381	85	304	158	253	1880
1944	238	0	35	303	1095	0	0	94	9	158	51	149	2132
1945	560	214	90	567	125	503	67	14	86	228	152	174	2780
1946	226	366	186	89	59	637	26	40	25	80	368	96	2198
1947	31	383	142	594	7	74	0	136	35	89	344	574	2409
1948	333	181	0	224	432	260	0	0	48	230	127	235	2070
1949	474	222	406	40	382	575	295	0	324	193	494	96	3501
1950	419	751	1188	469	232	215	338	218	86	557	347	134	4954
1951	243	773	0	35	34	641	18	408	427	243	102	50	2974
1952	56	100	319	1007	203	1117	161	82	28	907	447	383	4810
1953	149	96	31	11	886	0	0	180	28	183	102	130	1796
1954	156	645	0	60	7	75	22	0	28	162	307	296	1758

RAINFALL STATISTICS

KAMERUKA ESTATE



YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
1955	116	509	229	22	648	67	8	0	80	275	15	398	2367
1956	374	1288	863	188	992	850	301	0	294	164	124	51	5489
1957	5	232	103	0	23	291	625	660	95	46	70	162	2312
1958	342	370	125	47	56	312	64	86	210	79	55	321	2067
1959	158	127	501	116	4	261	394	27	211	1057	511	139	3506
1960	344	0	238	0	118	61	574	86	517	243	122	523	2826
1961	150	133	1011	119	6	206	620	283	557	173	1125	636	5019
1962	398	180	151	127	80	0	120	129	465	123	88	301	2162
1963	296	279	185	442	817	550	377	224	155	278	136	441	4180
1964	0	230	70	1109	43	236	0	503	33	363	236	0	2823

RAINFALL STATISTICS.

KAMERUKA ESTATE

CANDELO RAINFALL STATISTICS.

YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
1887	NO RECORDS.		22	250	182	452	174	349	102	297	687	396	
1888	170	146	259	0	115	35	3	134	359	63	167	939	2390
1889	386	174	70	93	477	306	60	125	237	217	327	50	2522
1890	191	532	1310	72	266	496	125	98	319	148	131	146	3834
1891	355	211	63	327	32	2606	486	312	324	197	270	460	5643
1892	65	15	730	180	115	5	170	180	889	1175	709	15	4248
1893	330	65	1080	430	15	260.	610	10	165	460	400	545	4370
1894	315	160	930	360	5	400	0	10	135	290	35	260	2900
1895	657	295	130	40	150	140	0	322	245	5	0	95	2079
1896	222	404	103	10	570	685	3	265	130	166	161	202	2921
1897	407	459	110	66	24	378	140	69	108	230	23	303	2317
1898	2	2601	0	10	89	182	50	430	20	181	15	107	3687
1899	412	33	80	603	242	576	178	613	110	125	180	17	3169
1900	276	5	234	362	1921	84	139	25	128	2	296	50	3522
1901	120	60	135	122	35	121	151	896	166	196	98	104	2204
1902	280	32	213	74	7	271	824	38	83	222	68	855	2967
1903	15	37	178	67	207	141	350	115	266	179	95	454	2104
1904	291	261	23	160	72	0	274	85	50	76	26	84	1402

CANDELO RAINFALL STATISTICS.

YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
1905	236	167	275	299	232	40	35	190	71	652	0	117	2314
1906	118	85	988	22	76	41	48	322	251	88	128	150	2317
1907	457	102	334	96	78	384	0	118	0	53	150	357	2129
1908	152	303	63	200	160	68	40	535	201	114	130	32	1998
1909	366	373	67	29	17	460	210	34	47	93	13	208	1917
1910	531	20	239	0	7	125	161	112	227	144	179	193	1838
1911	981	224	613	24	164	162	105	131	226	214	204	177	3225
1912	27	106	435	33	103	214	830	24	70	36	416	244	2538
1913	84	144	521	339	723	957	65	3	237	415	114	20	3622
1914	77	30	1486	629	36	2	393	0	501	119	171	316	3760
1915	103	15	156	210	41	121	71	118	527	182	50	189	1783
1916	232	484	174	132	29	90	152	63	463	461	184	243	2707
1917	566	178	149	173	257	128	39	92	270	130	529	231	2742
1918	784	254	53	133	52	53	495	172	59	104	160	92	2411
1919	22	2264	152	180	358	34	22	121	90	88	366	952	4649
1920	825	54	150	114	11	31	135	149	179	355	184	537	2724
1921	178	483	234	343	205	148	30	49	49	179	232	532	2662
1922	389	278	37	41	187	193	1087	240	368	150	66	172	3208

YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
1923	124	50	20	33	11	198	99	23	624	137	193	395	1907
1924	252	242	463	193	93	96	117	72	112	61	340	880	2921
1925	402	224	146	62	1657	265	190	44	23	191	90	84	3378
1926	393	12	394	133	105	236	89	75	228	87	26	165	1943
1927	286	40	105	384	185	0	142	8	97	371	152	105	1875
1928	204	735	965	44	73	708	27	22	59	54	35	80	3006
1929	11	1062	228	263	73	42	16	462	79	261	551	159	3207
1930	45	118	99	37	403	309	119	21	95	548	54	266	2114
1931	198	103	258	199	248	115	100	15	140	125	91	108	1700
1932	3	156	267	287	154	20	259	228	262	196	308	327	2467
1933	393	6	232	111	178	352	182	155	232	228	291	654	3014
1934	1416	878	76	944	171	492	726	376	112	219	310	153	5873
1935	190	797	119	729	45	100	42	22	194	321	257	253	3069
1936	386	420	501	262	65	347	202	203	35	31	168	765	3385
1937	338	132	595	12	54	383	28	129	180	423	157	542	2973
1938	313	217	147	37	112	72	99	447	221	285	290	32	2272
1939	366	200	644	552	138	96	42	697	5	126	292	20	3178
1940	195	103	33	441	104	79	17	31	208	11	147	464	1833

CANDELO RAINFALL STATISTICS.

YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
1941	411	78	286	151	23	74	34	65	116	149	87	130	1604
1942	26	274	461	40	126	82	74	15	68	363	789	76	2394
1943	270	71	47	87	176	85	0	413	104	339	153	215	1960
1944	160	3	53	389	1025	22	72	116	0	166	61	149	2216
1945	635	133	115	595	131	585	66	65	39	284	185	190	3023
1946	223	477	257	89	75	672	30	63	37	125	502	124	2674
1947	61	396	155	611	0	109	6	142	66	71	410	645	2672
1948	338	310	22	343	465	326	9	0	34	291	198	253	2589
1949	467	220	239	65	415	708	294	18	323	258	572	84	3663
1950	368	838	774	385	219	213	289	206	78	661	343	129	4503
1951	286	698	3	103	35	794	52	465	416	214	182	120	3368
1952	70	91	330	905	216	1178	182	94	56	688	461	397	4668
1953	410	140	49	26	765	22	1	179	36	199	172	166	2165
1954	132	625	2	60	7	127	46	9	40	129	444	161	1782
1955	108	425	219	17	613	68	42	15	94	323	101	442	2467
1956	331	1278	871	123	903	857	323	30	213	357	155	49	5490
1957	29	236	188	4	41	287	636	628	94	61	70	215	2489
1958	276	346	94	49	70	387	69	98	276	106	78	480	2329

CANDELO RAINFALL STATISTICS.

YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
1959	189	149	547	175	15	322	444	44	290	1041	509	197	3922
1960	353	41	237	38	221	107	624	118	666	386	230	601	3622
1961	199	184	952	151	28	184	703	276	709	221	1234	691	5532
1962	390	228	156	136	145	8	92	156	560	173	117	585	2746
1963	354	326	259	466	846	733	391	267	155	211	297	559	4864
1964	23	263	156	1155	90	197	20	495	33	321	250	171	3174

YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
1887					NO RECORDS						172	712	
1888	240	67	144	16	113	0	0	159	287	0	76	838	1940
1889	283	140	0	138	789	159	46	108	206	230	373	100	2572
1890	186	615	1266	83	293	750	424	74	27	122	213	118	4171
1891	493	203	3	523	32	2734	206	205	521	635	495	24	6074
1895	937	264	8	58	177	84	0	397	101	37	0	80	2143
1896	239	750	109	0	754	741	22	228	79	173	263	403	3761
1897	348	643	37	255	102	456	183	187	100	104	4	257	2676
1898	83	2570	15	0	289	423	5	638	65	214	8	0	4310
1899	276	29	43	562	166	571	219	722	130	183	204	90	3195
1900	197	188	218	271	2050	267	394	11	379	23	350	104	4452
1901	34	64	159	233	49	162	207	1419	301	354	123	18	3123
1902	314	42	253	54	20	118	955	240	135	422	118	1527	4198
1905	108	170	391	254	152	159	68	63	130	514	289	362	2660
1907	502	74	291	285	159	466	0	65	0	44	94	150	2130
1908		NO RECORDS			224	63	N.R.	763	387	N.R.	126	N.R.	
1909	301	116	56	0	0	780	341	35	1	179	70	165	2044
1910	1055	0	418	22	4	142	294	0	141	186	183	142	2587

COBARGO RAINFALL STATISTICS.

COBARGO RAINFALL STATISTICS.

YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
1911	1451	148	703	0	150	158	134	205	140	88	119	190	3486
1912	113	246	512	99	211	336	1057	23	39	60	262	201	3159
1913	146	60	853	372	1072	1240	116	11	249	402	100	153	4774
1914	129	76	1505	609	82	19	684	16	687	355	365	389	4916
1915	367	40	103	348	42	237	55	146	664	120	33	228	2383
1916	279	472	252	240	39	111	149	133	787	1270	437	765	4934
1917	491	270	466	339	259	232	8	51	157	131	759	209	3372
1918	827	317	116	170	19	28	767	63	88	35	250	62	2742
1919	43	1568	118	163	430	45	79	112	107	132	523	625	3945
1920	915	105	179	64	37	45	168	117	182	162	171	710	2855
1921	140	920	143	394	221	210	48	51	25	269	100	549	3070
1922	695	386	33	40	96	166	1687	265	475	151	36	193	4223
1923	94	73	15	34	20	208	187	43	625	288	212	542	2341
1924	312	244	195	334	84	88	285	66	77	109	379	833	3006
1925	415	208	209	69	2212	450	128	20	0	120	139	30	4000
1926	191	13	336	149	165	279	73	42	340	128	4	217	1937
1927	225	61	142	497	212	29	84	10	184	305	280	18	2047
1928	408	655	926	75	84	687	76	30	29	80	34	33	3117



COBARGO RAINFALL STATISTICS.

YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
1929	66	1632	193	380	124	33	40	562	85	220	515	189	4039
1930	48	61	255	43	526	457	95	37	39	441	138	322	2462
1931	157	93	195	311	517	133	107	2	189	168	181	75	2128
1932	33	138	338	244	240	25	288	316	394	322	385	266	2989
1933	565	11	263	365	179	464	276	96	233	260	390	412	3514
1934	1923	1252	100	993	240	615	840	575	170	198	335	114	7355
1935	305	489	91	955	16	148	80	10	302	340	323	363	3422
1936	446	302	1084	186	77	412	221	129	81	63	243	827	4071
1937	473	222	671	43	32	559	59	186	156	327	138	432	3298
1938	316	340	157	68	168	79	100	488	232	388	286	2	2624
1939	401	245	553	641	111	33	74	577	32	118	222	66	3073
1940	219	68	29	635	140	17	29	34	392	32	127	425	2147
1941	410	163	287	210	67	74	51	80	113	115	199	52	1821
1942	30	217	427	61	192	88	80	2	75	608	1278	67	3125
1943	272	89	82	113	519	96	0	353	125	450	318	202	2619
1944	35	7	152	255	1307	8	78	120	0	125	60	59	2206

COBARGO RAINFALL STATISTICS

YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
1945	625	232	85	1044	117	465	66	31	16	244	90	216	3231
1946	235	303	182	153	106	756	0	52	57	60	539	72	2515
1947	78	873	74	628	25	161	0	162	41	91	565	901	3599
1948	795	285	48	259	715	510	0	9	64	257	193	283	3418
1949	264	356	520	58	492	786	217	2	431	128	641	193	4088
1950	612	889	1317	790	522	475	454	271	142	758	377	142	6749
1951	475	1276	16	42	77	1135	41	345	690	407	97	72	4673
1952	119	102	659	1784	223	1679	366	451	18	1391	842	530	8164
1953	176	114	104	26	1454	21	9	222	66	316	96	276	2880
1954	97	1128	26	17	15	257	43	27	50	252	534	168	2614
1955	225	702	177	158	903	98	52	36	158	407	126	541	3583
1956	245	2599	1142	369	1224	1474	512	23	174	453	183	152	8550
1957	93	387	104	15	14	329	978	705	82	67	100	216	3090

COBARGO RAINFALL STATISTICS

YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
1958	529	647	170	39	59	374	134	141	132	94	34	203	2556
1959	291	225	934	139	13	491	566	86	190	1356	371	307	4969
1960	264	88	421	55	209	101	624	162	851	267	278	877	4197
1961	543	291	1189	141	56	430	724	455	961	358	1692	719	7559
1962	451	516	216	84	147	0	199	276	927	167	239	758	3980
1963	371	336	365	732	928	684	490	286	326	216	296	581	5611
1964	33	304	289	1177	161	246	66	549	81	345	258	252	3761

YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
1906	0	0	673	555	221	344	78	136	179	87	70	421	2764
1924	444	300	258	380	104	192	250	109	119	64	46	789	3055
1925	511	285	214	101	3022				NO RECORD				
1927	429	137	131	519	393	19	341	51	287	409	266	114	3096
1928	697	1108	1027	219	161	966	119	50	127	92	53	108	4727
1929	85	2561	346	832	254	93	24	604	120	550	703	267	6439
1930	87	337	257	73	439	608	136	60	99	1037	130	683	3946
1931	272	113	571	321	449	183	133	34	232	196	379	107	2990
1932	45	451	486	185	417	47	507	391	533	267	625	266	4220
1933	702	29	297	169	369	526	373	161	428	358	558	827	4797
1934	1865	1375	166	1000	225	539	880	553	140	352	463	322	7880
1935	326	835	161	803	60	131	82	49	444	434	248	283	3856
1936	455	379	591	334	67	478	291	215	75	73	144	932	4034
1937	328	232	936	65	90	603	76	226	205	482	116	551	3910
1938	625	565	247	90	156	104	166	1006	378	302	322	35	3996
1939	573	349	540	874	162	76	80	1030	51	194	311	63	4303

MOUNT DARRAGH RAINFALL STATISTICS

MOUNT DARRAGH RAINFALL STATISTICS.

YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
1940	293	125	32	679	188	41	47	73	429	67	253	529	2756
1941	680	115	359	312	31	149	68	149	219	130	177	112	2501
1942	57	371	799	107	179	140	146	46	89	789	1017	112	3852
1943	417	74	139	128	540	99	2	533	180	399	258	415	3184
1944	224	16	150	284	1912	30	132	138	41	275	52	104	3358
1945	884	230	121	840	128	959	129	65	79	317	321	129	4202
1946	409	475	316	218	196	684	15	68	87	137	572	104	3281
1947	20	671	173	688	12	139	27	173	102	248	122	1053	3428
1948	527	341	27	246	862	250	4	0	12	336	131	357	3093
1949	447	370	301	104	347	855	213	5	436	383	708	128	4297
1950	342	1002	1134	753	518	483	390	131	113	879	409	215	6369
1951	483	1462	7	100	54	1329	103	664	669	333	271	80	5555
1952	63	162	421	1148	288	2179	346	230	40	1176	740	525	7318
1953	305	187	134	32	1269	76	53	174	79	60	45	118	2532
1954	306	874	5	101	22	121	24	87	4	155	444	164	2307
1955	250	685	290	30	1120	95	83	11	180	480	125	695	4044
1956	374	2159	955	268	1040	934	593	0	87	288	0	0	6698

MOUNT DARRAGH RAINFALL STATISTICS

YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
1957	0	346	173	0	68	615	1088	1285	167	114	124	359	4339
1958	366	579	125	0	40	505	45	119	457	116	244	285	2881
1959	351	208	1048	356	98	537	466	91	276	1429	537	235	5632
1960	357	54	380	98	249	148	1073	55	694	350	226	756	4440
1961	203	330	1125	139	100	416	1107	418	777	219	1827	1248	7909
1962	470	657	320	169	162	2	150	417	608	214	133	838	4140
1963	454	330	594	618	914	786	444	334	373	226	288	689	6050

PAMBULA RAINFALL STATISTICS.

YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
1909	268	610	87	16	8	888	306	32	73	133	12	195	2628
1910	931	50	482	0	0	276	345	0	207	204	200	241	2936
1911	1830	153	936	16	204	205	162	140	173	64	173	222	4278
1912	52	157	399	70	153	481	809	12	43	49	354	351	2930
1913	41	105	602	259	851	1005	92	0	385	397	85	42	3864
1914	90	17	1255	895	45	0	598	0	342	171	305	201	3919
1915	197	32	149	384	52	120	69	219	580	231	28	116	2177
1916	194	465	268	155	48	57	178	83	547	456	313	346	3110
1917	319	218	208	246	297	243	40	129	140	74	811	143	2868
1918	1233	257	57	67	96	245	620	117	70	177	208	154	3301
1919	7	1361	132	151	665	33	53	351	273	90	232	778	4126
1920	691	26	210	91	0	45	130	194	175	355	129	637	2683
1921	130	343	163	335	257	209	51	77	90	219	238	767	2879
1922	441	294	42	47	237	279	688	329	615	144	68	284	3468
1923	101	94	18	37	14	231	142	47	594	290	224	323	2115
1924	287	462	248	229	109	148	199	70	66	139	298	878	3133
1925	414	265	201	129	1265	332	160	90	16	86	150	56	3164
1926	463	3	602	213	103	182	76	214	223	143	14	235	2471
1927	364	38	76	506	261	0	177	16	195	294	207	64	2198

YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
1928	289	553	1006	147	133	937	51	28	84	118	231	119	3696
1929	50	1240	127	490	122	54	26	539	138	274	437	254	3751
1930	37	109	366	128	505	621	439	58	85	473	58	307	3186
1931	107	89	427	238	333	156	169	14	135	99	121	105	1993
1932	22	197	365	350	230	33	485	215	658	280	355	381	3571
1933	1081	0	296	127	298	283	269	286	149	218	320	526	3853
1934	1237	732	172	1554	199	763	442	511	103	320	259	102	6394
1935	284	547	109	699	69	149	48	25	179	229	253	236	2827
1936	271	252	439	249	157	214	333	569	62	18	213	1030	3807
1937	646	176	589	0	59	612	42	217	237	500	38	691	3807
1938	487	536	259	51	160	278	218	240	220	439	420	20	3328
1939	681	121	515	563	190	156	67	876	16	154	427	37	3803
1940	152	69	50	497	128	49	0	45	327	37	269	480	2103
1941	497	91	331	329	21	138	22	115	292	121	109	146	2212
1942	28	292	463	58	129	128	76	17	75	703	1346	11	3326
1943	348	64	42	85	318	207	0	594	83	292	132	200	2365
1944	56	6	178	313	1037	27	110	148	24	282	14	102	2297
1945	477	117	112	817	147	545	135	41	87	199	224	132	3033
1946	317	436	251	135	100	879	63	157	145	118	697	141	3439



PAMBULA RAINFALL STATISTICS.

YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
1947	51	495	143	583	50	246	59	190	125	192	364	700	3198
1948	609	211	28	548	666	346	29	6	42	395	129	231	3240
1949	444	381	498	30	499	831	302	26	401	271	786	57	4526
1950	492	1188	1436	858	473	324	577	377	124	565	263	151	6828
1951	260	493	33	92	100	1180	112	699	654	373	165	95	4256
1952	81	124	733	818	287	1274	201	213	43	1085	734	394	5987
1953	495	62	82	88	1150	53	18	320	53	264	217	182	2984
1954	320	728	0	95	31	191	85	82	80	210	504	101	2427
1955	155	505	231	41	455	65	161	18	130	357	122	374	2614
1956	331	1291	1380	167	1537	978	416	62	224	330	176	137	7029
1957	12	518	123	29	56	200	545	888	109	105	113	184	2882
1958	343	407	181	48	69	328	100	197	348	191	47	496	2755
1959	158	137	813	104	130	399	439	92	307	719	401	265	3964
1960	169	50	319	30	239	196	656	53	863	302	412	906	4195
1961	233	276	1240	139	57	161	720	302	755	161	950	724	5759
1962	517	389	315	138	154	19	63	418	438	97	198	856	3602
1963	466	217	377	402	947	852	464	261	357	188	421	550	5502
1964	11	279	61	1460	121	297	18	658	40	244	250	205	3644

YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
1894			NO RECORD			426	43	168	45	213	4	236	
1895	254	117	113	77	61	313	44	221	69	33	5	127	1434
1896	204	269	72	79	431	711	101	257	261	73	268	110	2836
1897	576	442	224	124	171	287	80	290	274	130	41	337	2976
1898	14	1004	81	32	232	198	249	342	145	314	63	70	2744
1899	143	81	157	780	193	408	506	589	96	144	91	26	3214
1900	190	120	216	321	835	291	496	111	204	20	189	115	3108
1901	178	63	231	257	0	110	181	766	145	348	142	20	2441
1902	277	11	334	63	25	213	874	65	99	217	76	357	2611
1903	0	187	129	198	180	165	215	66	342	356	142	460	2440
1904	417	252	96	198	182	136	518	204	81	189	60	78	2411
1905	283	186	164	186	108	205	211	91	62	535	0	125	2156
1906	53	30	724	75	99	42	42	259	214	208	299	110	2155
1907	330	55	151	129	107	377	45	50	30	88	212	381	1955
1908	182	206	90	72	60	109	45	472	516	237	202	79	2270
1909	300	567	77	0	33	611	304	55	109	145	17	141	2359
1910	693	14	149	3	10	119	319	8	309	149	165	360	2298
1911	913	254	561	0	244	232	237	126	216	174	33	346	3336

NIMTABEL RAINFALL STATISTICS.

NIMMITABEL RAINFALL STATISTICS.

YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
1912	80	145	156	84	95	143	748	27	87	157	183	282	2187
1913	270	176	675	136	828	888	125	68	295	264	181	128	4034
1914	175	5	740	107	127	68	506	0	211	82	180	461	2662
1915	351	5	35	48	71	278	135	175	547	146	72	428	2291
1916	172	398	168	123	52	159	207	142	586	602	345	408	3362
1917	689	200	95	117	54	86	96	101	155	268	284	411	2556
1918	385	186	223	94	62	58	317	162	134	82	62	71	1836
1919	1	568	58	145	330	48	63	330	95	158	112	605	2513
1920	890	111	344	170	44	101	112	208	219	238	257	755	3449
1921	288	495	333	265	161	216	52	47	117	242	241	485	2942
1922	437	268	52	77	90	166	1617	285	288	182	39	204	3705
1923	157	2	2	9	35	211	170	45	366	230	230	371	1828
1924	310	283	112	185	136	122	110	160	226	107	440	634	2825
1925	368	164	130	163	1271	242	293	199	60	257	235	31	3413
1926	228	1	259	210	149	209	138	201	121	121	54	251	1942
1927	203	46	85	538	374	40	269	101	292	464	236	143	2791
1928	141	603	731	231	217	708	113	30	178	121	108	119	3300
1929	9	839	108	256	228	195	103	234	165	183	449	320	3089

NIMMITABEL RAINFALL STATISTICS.

YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
1930	28	202	24	44	170	456	111	130	88	286	106	348	1993
1931	109	69	158	215	419	382	141	75	130	241	298	72	2309
1932	5	160	641	205	337	75	464	464	328	261	183	283	3407
1933	175	13	32	133	235	400	261	64	227	198	424	456	2618
1934	1087	356	76	455	82	458	749	410	78	369	376	158	4654
1935	271	570	98	747	46	60	76	55	224	379	146	315	2987
1936	300	313	223	308	87	578	177	177	129	64	85	439	2880
1937	355	129	264	100	106	488	86	239	259	477	191	759	3453
1938	346	137	159	140	68	69	160	527	215	119	154	39	2133
1939	206	204	502	288	113	122	101	496	87	194	232	33	2578
1940	328	70	5	515	248	127	33	103	348	47	166	254	2244
1941	911	146	114	214	96	159	113	126	177	134	188	95	2473
1942	17	189	554	10	153	197	164	34	109	425	700	95	2647
1943	300	77	49	130	354	82	26	297	181	340	197	294	2327
1944	112	4	104	366	932	26	84	95	33	188	72	171	2187
1945	367	192	138	767	176	323	72	84	82	296	273	138	2908
1946	381	335	182	229	193	695	59	65	76	90	239	253	2797
1947	33	432	338	169	17	97	75	125	48	72	355	517	2278

NIMMITAEE L. RAINFALL STATISTICS.

YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
1948	666	352	46	385	281	153	24	40	139	436	264	342	3128
1949	435	230	302	49	328	615	153	45	169	269	335	205	3135
1950	398	610	815	293	432	257	265	137	116	761	433	231	4748
1951	214	493	5	161	59	603	126	431	506	297	223	315	3433
1952	75	94	401	641	173	1031	185	231	54	426	487	643	4441
1953	156	116	80	76	916	87	92	316	118	229	154	193	2533
1954	475	387	3	55	85	364	123	78	86	354	439	37	2486
1955	114	319	239	37	254	144	78	85	96	343	81	592	2382
1956	343	517	817	288	719	801	258	112	129	192	174	154	4504
1957	28	193	120	29	46	260	488	398	88	122	168	275	2215
1958	311	286	69	51	90	265	169	87	309	111	115	462	2325
1959	147	392	378	236	42	448	488	161	399	773	302	206	3972
1960	307	83	347	52	215	173	609	98	525	204	180	529	3322
1961	301	167	827	199	134	204	424	297	592	172	423	563	4303
1962	343	305	55	124	231	24	162	170	482	225	118	808	3047
1963	497	199	170	389	445	239	420	146	245	174	184	286	3394
1964	16	137	107	575	175	295	132	439	145	413	182	193	2809

STATISTICAL RAINFALL DATA  
(Points)

Station	Rainfall Statistic	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Bega (Period 80 Years)	Minimum	6	9	0	0	2	0	0	0	0	3	0	8	1579
	10%	39	38	29	14	18	26	6	10	43	49	32	43	2146
	30%	147	108	113	55	64	103	55	44	87	130	121	138	2658
	50%	244	182	222	159	139	221	118	129	126	198	176	217	3188
	70%	408	328	371	302	283	433	263	275	210	274	279	407	3817
	90%	773	897	963	618	885	844	629	564	610	576	525	802	5402
	Maximum	1700	2877	2637	1612	2504	2714	1397	1286	944	1039	1066	1173	7219
Bemboka (Period 74 years)	Minimum	0	0	0	0	0	0	0	0	0	9	0	4	1512
	10%	40	37	28	8	10	15	5	1	21	45	30	44	1819
	30%	182	112	119	42	46	64	32	33	63	131	104	112	2593
	50%	295	200	175	138	113	224	80	88	135	183	161	211	3069
	70%	364	365	347	278	183	344	225	201	223	285	285	387	3692
	90%	579	1063	960	621	811	734	630	577	513	515	500	767	5248
	Maximum	1992	2465	1938	1632	2601	2409	1913	1704	826	1260	1501	1093	6611
Kameruka Estate (Period 63 Years)	Minimum	0	0	0	0	0	0	0	0	0	10	0	0	1541
	10%	28	30	35	17	9	7	0	2	26	61	49	47	1687
	30%	149	93	105	57	43	74	33	28	58	117	102	134	2132
	50%	226	180	185	127	111	133	100	86	109	173	158	186	2444
	70%	344	278	281	228	180	285	174	177	211	243	254	367	2968
	90%	524	692	719	583	742	612	587	416	419	462	475	632	4000
	Maximum	1189	1310	1548	1109	2030	1117	1227	970	579	1057	1125	916	5489

STATISTICAL RAINFALL DATA  
(Points)

Station	Rainfall Statistic	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Candelo (Period 77 years)	Minimum	2	3	0	0	0	0	0	0	0	2	0	15	1402
	10%	27	28	36	21	14	22	5	12	35	60	33	50	1868
	30%	164	103	112	63	58	87	42	44	78	125	115	126	2317
	50%	276	200	188	133	115	162	99	116	135	191	172	193	2724
	70%	366	307	282	277	206	324	182	186	235	275	291	345	3208
	90%	538	747	883	597	635	708	613	463	471	460	503	647	4532
	Maximum	1416	2601	1486	1155	1921	2606	1087	896	889	1175	1234	952	5873
Mt. Darragh (Period 39 years)	Minimum	0	0	5	0	12	2	2	0	4	60	0	0	2307
	10%	45	54	32	32	40	41	24	11	41	73	52	80	2756
	30%	272	208	166	107	104	121	78	65	99	194	131	118	3281
	50%	357	346	301	246	196	250	133	136	179	288	258	283	4034
	70%	454	579	540	519	393	539	341	230	373	383	409	529	4440
	90%	697	1375	1027	840	1040	959	880	664	608	879	708	838	6698
	Maximum	1865	2561	1134	1148	1912	2179	1107	1285	777	1429	1827	1248	7909
Nimmitabel (Period 70 Years)	Minimum	0	1	2	0	0	24	24	0	30	20	0	20	1434
	10%	18	13	36	32	42	61	46	45	70	82	55	70	2135
	30%	161	118	95	80	88	130	102	86	109	147	125	139	2366
	50%	274	190	153	153	157	207	156	139	160	206	183	264	2703
	70%	345	299	253	230	232	308	260	233	240	281	240	368	3122
	90%	657	562	672	509	444	615	506	438	474	435	424	589	3945
	Maximum	1087	1004	827	780	1271	1031	1617	766	592	773	700	808	4748

MINIMUM RAINFALL RECORDED  
IN CONSECUTIVE MONTHS

Station	Number of Months	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Bega	1	6	9	0	0	2	0	0	0	0	3	0	8
	2	93	31	34	7	43	29	6	21	24	3	79	79
	3	111	65	51	119	140	120	60	101	118	125	131	168
	4	145	82	230	154	175	211	160	232	231	242	244	242
	5	162	334	283	289	263	403	283	315	325	484	302	299
	6	414	486	295	298	449	507	330	352	522	565	336	316
	7	573	534	304	484	584	668	367	639	663	599	353	568
	8	614	749	490	738	723	707	819	780	915	616	605	727
	9	1069	901	839	907	762	869	1168	1032	1168	868	764	768
	10	1146	1027	990	946	924	1215	1325	1204	1284	1027	805	1290
	11	1205	1166	1111	1108	1324	1458	1368	1284	1444	1068	1416	1460
	12	1579	1205	1273	1509	1513	1608	1392	1444	1569	1568	1652	1590
Candelo	1	2	3	0	0	0	0	0	0	0	2	0	15
	2	52	56	10	7	38	23	9	34	53	5	95	78
	3	194	103	64	132	115	125	43	130	148	100	126	127
	4	227	114	196	153	189	210	162	170	228	180	241	351
	5	238	312	242	249	229	346	197	250	239	483	432	399
	6	436	411	251	289	358	437	277	261	623	582	465	410
	7	535	434	291	418	548	586	288	638	774	615	476	608
	8	558	791	420	699	667	681	738	816	913	626	674	707
	9	1048	935	766	827	704	853	955	938	948	824	773	730
	10	1177	1027	850	855	978	1039	1077	973	1069	923	796	1214
	11	1318	1111	1086	1129	1345	1161	1112	1094	1220	946	1383	1242
	12	1402	1219	1253	1505	1479	1196	1233	1245	1314	1525	1515	1389



MINIMUM RAINFALL RECORDED IN CONSECUTIVE MONTHS

Station	Number of Months	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Nimmitabel	1	0	1	2	0	0	24	24	0	30	20	0	20
	2	83	4	11	13	106	84	64	80	102	38	117	72
	3	161	13	46	132	182	191	125	168	107	165	134	208
	4	170	48	257	258	237	238	213	326	234	216	208	365
	5	205	259	376	454	362	417	372	455	350	565	404	374
	6	416	429	472	531	434	498	499	512	667	586	413	409
	7	586	474	704	603	746	669	678	880	779	595	448	620
	8	631	840	931	823	873	887	972	1000	858	630	659	790
	9	997	1032	936	950	949	1198	1044	1079	918	841	829	835
	10	1227	1053	1063	1043	1294	1357	1123	1177	1129	1011	874	1201
	11	1307	1180	1266	1423	1418	1436	1416	1414	1299	1056	1240	1431
	12	1434	1384	1536	1495	1497	1793	1525	1525	1344	1422	1470	1661

BROGO RIVER AT NORTH BROGO.

LOCATION: Latitude 36° 32' Longitude 149° 50'

PERIOD OF ESTABLISHMENT: May 1954 to Date.

COMPLETE YEARS OF COMPUTED RECORDS: 11

ZERO OF GAUGE: R.L. 73.26 Assumed Datum.

CATCHMENT AREA: 152 Square Miles.

CONTROL: Rock bar.

EQUIPMENT: Automatic Recorder (pressure type) installed November, 1961.  
Staff Gauge, range 0 to 30 feet.  
Standard 8" Rain gauge installed October 1965.

CURRENT METER OBSERVATIONS:

- (a) Number obtained : 78
- (b) Maximum observation in cusecs : 10,439
- (c) Minimum observation in cusecs : 3

MAXIMUM ESTIMATED DISCHARGE DURING PERIOD OF RECORD: 75,200 cusecs.

MEAN DAILY DISCHARGE DURING PERIOD OF RECORDS: 263 cusecs.

MEAN ANNUAL DISCHARGE FOR 11 YEARS: 201,500 acre feet.

REMARKS: Periods of missing records computed by correlation with Bemboka River and Tantawanglo Creek.

BROGO RIVER AT NORTH BROGO.

Year 1954

Year 1955

Month	Discharge in Cusecs			Discharge for Month Acre-Feet	Month	Discharge in Cusecs			Discharge for Month Acre-Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.					Jan.	50	0	7	408
Feb.	Established				Feb.	499	8	81	4,558
Mar.	May 1954.				Mar.	182	58	96	5,968
Apr.					Apr.	58	11	23	1,406
May					May	15900	67	1007	62,408
June	No records			1,500 <sup>+</sup>	June	182	35	85	5,094
July	"	"		850 <sup>+</sup>	July	47	32	41	2,524
Aug.	"	"		820 <sup>+</sup>	Aug.	32	17	25	1,530
Sept.	"	"		650 <sup>+</sup>	Sept.	27	9	17	1,012
Oct.	71	3	12	718	Oct.	59	12	25	1,552
Nov.	351	7	64	3,868	Nov.	17	2	7	412
Dec.	32	4	11	706	Dec.	229	2	40	2,470
Totals	..	..	..	..	Totals	..	..	..	89,342

Year 1956

Year 1957

Jan.	167	12	49	3,046	Jan.	16	6	11	710
Feb.	39000	12	3505	203,296	Feb.	38	3	15	866
Mar.	4580	475	1491	92,442	Mar.	38	13	18	1,136
Apr.	603	118	288	17,280	Apr.	13	7	10	616
May	39000	127	1693	104,974	May	No records			920 <sup>+</sup>
June	45800	197	3606	216,334	June	"	"		1,350 <sup>+</sup>
July	8412	177	1310	81,218	July	11000	81	464	28,800
Aug.	193	83	132	8,172	Aug.	No records			28,500 <sup>+</sup>
Sept.	138	47	79	4,768	Sept.	"	"		2,350 <sup>+</sup>
Oct.	1212	55	208	12,868	Oct.	"	"		1,600 <sup>+</sup>
Nov.	60	24	39	2,340	Nov.	8	6	6	386
Dec.	40	16	27	1,670	Dec.	25	3	5	338
Totals	..	..	..	748,408	Totals	..	..	..	67,572 <sup>+</sup>

+ Estimated.

BROGO RIVER AT NORTH BROGO

Year 1958

Year 1959

Month	Discharge in Cusecs			Discharge for Month Acre-Feet	Month	Discharge in Cusecs			Discharge for Month Acre-Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	No records			1,000 +	Jan.	No records			930 +
Feb.	"	"		2,250 +	Feb.	"	"		480 +
Mar.	"	"		1,350 +	Mar.	"	"		3,450 +
Apr.	"	"		960 +	Apr.	"	"		2,550 +
May	"	"		890 +	May	30	12.2	19	1,153
June	"	"		2,250 +	June	3695	12.2	274	16,437
July	"	"		2,200 +	July	23300	43	1179	73,084
Aug.	"	"		1,100 +	Aug.	250	48	99	6,122
Sept.	"	"		1,150 +	Sept.	63	33	43	2,570
Oct.	"	"		1,000 +	Oct.	75200	38	2639	163,642
Nov.	"	"		750 +	Nov.	4640	126	553	33,172
Dec.	"	"		960 +	Dec.	297	97	186	11,548
Totals	..	..	..	15,860 +	Totals	..	..	..	315,138 +

Year 1960

Year 1961

Jan.	177	43	100	6,176	Jan.	No records.			1,950 +
Feb.	58	21	34	1,952	Feb.	"	"		1,450 +
Mar.	345	18	80	4,936	Mar.	"	"		18,800 +
Apr.	53	18	27	1,642	Apr.	"	"		2,750 +
May	33	15	25	1,524	May	"	"		2,050 +
June	58	15	26	1,558	June	"	"		1,950 +
July	23300	25	1134	70,290	July	"	"		28,200 +
Aug.	97	48	68	4,218	Aug.	"	"		11,500 +
Sept.	No records			16,200 +	Sept.	"	"		35,700 +
Oct.	"	"		3,250 +	Oct.	"	"		13,400 +
Nov.	"	"		2,200 +	Nov.	"	"		115,000 +
Dec.	"	"		13,000 +	Dec.	24600	180	1103	68,362
Totals	..	..	..	126,946 +	Totals	..	..	..	301,112 +

+ Estimated.

BROGO RIVER AT NORTH BROGO.

Year 1962

Year 1963

Month	Discharge in Cusecs			Discharge for Month Acre-Feet	Month	Discharge in Cusecs			Discharge for Month Acre-Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	640	175	355	22,014	Jan.	420	40	93	5,782
Feb.	14660	235	866	48,500	Feb.	575	57	107	6,006
Mar.	340	62	138	8,574	Mar.	1060	40	214	13,290
Apr.	105	55	65	3,876	Apr.	36500	20	787	47,214
May	55	40	50	3,104	May	15980	0	671	41,582
June	40	24	34	2,036	June	1550	162	513	30,782
July	105	16	29	1,774	July	3050	85	432	26,774
Aug.	105	9	36	2,240	Aug.	130	95	102	6,330
Sept.	15980	20	860	51,570	Sept.	2040	63	128	7,658
Oct.	100	40	65	4,028	Oct.	530	70	148	9,198
Nov.	57	24	41	2,450	Nov.	1035	70	134	8,064
Dec.	3050	28	269	16,658	Dec.	5000	56	584	36,200
Totals	..	..	..	166,824	Totals	..	..	..	238,880

Year 1964

Year 1965

Jan.	105	43	64	3,986	Jan.	24	7	12	712
Feb.	85	24	45	2,518	Feb.	7.	3	5	280
Mar.	95	28	42	2,600	Mar.	3	3	3	186
Apr.	28200	28	908	54,462	Apr.	20	3	10	624
May	205	55	93	5,790	May	17	7	10	606
June	1940	55	260	15,600	June	9	5	6	372
July	85	40	59	3,650	July	9	3	7	412
Aug.	9500	34	435	26,950	Aug.	235	5	28	1,752
Sept.	300	62	114	6,858	Sept.	89	9	21	1,270
Oct.	85	40	62	3,868	Oct.	420	5	46	2,860
Nov.	85	34	57	3,522	Nov.	24	1	14	858
Dec.	34	24	26	1,624	Dec.	920	7	73	4,526
Totals	..	..	..	131,428	Totals	..	..	..	14,458

RUTHERFORD CREEK AT SOLID CUTTING

LOCATION: Latitude 36°36' Longitude 149°27'.

PERIOD OF ESTABLISHMENT: April, 1924 to August, 1931.  
May, 1948 to date.

COMPLETE YEARS OF COMPUTED RECORDS: 23.

ZERO OF GAUGE: R.L. 2716.02 Barometric Datum.

CATCHMENT AREA: 6 Square Miles.

CONTROL: Rock and gravel. Subject to alteration.

EQUIPMENT: Automatic Recorder (Float type) installed August, 1954.  
Staff gauge, range 0 to 15 feet.

CURRENT METER OBSERVATIONS:

(a) Number obtained	:	132
(b) Maximum observation in cusecs	:	166
(c) Minimum observation in cusecs	:	0.93

MAXIMUM ESTIMATED DISCHARGE DURING PERIOD OF RECORDS: 760 cusecs.

MEAN DAILY DISCHARGE DURING PERIOD OF RECORDS: 12.0 cusecs.

MEAN ANNUAL DISCHARGE FOR 23 YEARS: 9,200 acre feet.

REMARKS: Periods of missing records computed by correlation with Bemboka River and rainfall relationships.

RUTHERFORD CREEK AT SOLID CUTTING.

Year 1924

Year 1925.

Month	Discharge in Cusecs			Discharge for Month Acre-Feet	Month	Discharge in Cusecs			Discharge for Month Acre-Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	..	..	..	..	Jan.	87	4	27	1,714
Feb.	..	..	..	..	Feb.	160	1.5	37	2,284
Mar.	..	..	..	..	Mar.	6	1.5	2.3	141
Apr.	4	1.5	2.3	138	Apr.	3	1.5	2.1	127
May	2	1.5	1.5	96	May	No records			2,400*
June	3	1.5	1.8	105	June	" "			700*
July	2.5	1.5	1.7	104	July	87	11	31	1,924
Aug.	2.5	1.5	1.7	104	Aug.	54	5	17	1,060
Sept.	2.5	1	1.3	79	Sept.	54	2.5	14	836
Oct.	3	1	2	125	Oct.	5	3.5	4.6	286
Nov.	5.5	1	1.7	106	Nov.	5	2.5	4.0	251
Dec.	143	2	21	1,294	Dec.	4	2.5	3.3	202
Totals	..	..	..	..	Totals	..	..	..	11,925*

Year 1926

Year 1927

Jan.	7.5	2	3.4	211	Jan.	3	2	2.3	145
Feb.	3	1.5	2	110	Feb.	3	1.2	1.9	105
Mar.	4.5	0.5	1.7	107	Mar.	3	1	2	127
Apr.	4	2	3	188	Apr.	24	1	6.5	403
May	5	2	3.2	197	May	11	3	6.4	397
June	51	2	6	416	June	3	1.5	2.2	131
July	3.5	1.5	2.4	146	July	5	1.5	3	185
Aug.	3	2	2.1	134	Aug.	3.5	2	2.4	149
Sept.	2.5	2	2.2	133	Sept.	2.7	1	1.5	94
Oct.	3	2	2.2	136	Oct.	4.5	1	2.3	140
Nov.	2.2	1.2	2	123	Nov.	3	1	2	129
Dec.	2.7	0	1	64	Dec.	2.5	1.7	2.2	138
Totals	..	..	..	1,965	Totals	..	..	..	2,143

\* Estimated.

RUTHERFORD CREEK AT SOLID CUTTING.

Year 1928

Year 1929.

Month	Discharge in Cusecs			Discharge for Month Acre-Feet	Month	Discharge in Cusecs			Discharge for Month Acre-Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	2	1	1.5	91	Jan.	1	0	0.6	40
Feb.	30	1	9.5	552	Feb.	234	0.5	97	5,410
Mar.	65	5	25	1,577	Mar.	80	3	15	906
Apr.	16	3	6.5	390	Apr.	11	3	4.7	285
May	6	4	4.7	295	May	8	3	5	298
June	58	3	15	919	June	5	3	4	262
July	6	4	4.7	295	July	5	2	3	198
Aug.	8	3	6	348	Aug.	16	3	6	376
Sept.	7.5	4	5	330	Sept.	16	5	8	501
Oct.	6	3	4.5	279	Oct.	6	3	4	258
Nov.	5	2	3.7	223	Nov.	65	3	23	1,394
Dec.	2	1	1.5	95	Dec.	11	5	7	441
Totals	..	..	..	5,394	Totals	..	..	..	10,369

Year 1930

Year 1931

Jan.	8	5	6	352	Jan.	3	2	2.4	148
Feb.	5	3	4	203	Feb.	2.5	1.5	2	114
Mar.	3	2	2	118	Mar.	3.5	1.5	2.2	137
Apr.	2	2	2	107	Apr.	58	2	26	1,561
May	11	2	3	209	May	51	3	15	941
June	13	3	7	439	June	30	2	9.8	588
July	5	3	3	211	July	5.5	2	3.4	211
Aug.	6	3	4	225	Aug.	6	2.5	3.6	225
Sept.	4.5	2	3.5	203	Sept.	No further records until June, 1948			
Oct.	5	2	3	195	Oct.	..	..	..	..
Nov.	3	2	2.4	140	Nov.	..	..	..	..
Dec.	4	2	2.2	160	Dec.	..	..	..	..
Totals	..	..	..	2,562	Totals	..	..	..	..



RUTHERFORD CREEK AT SOLID CUTTING.

Year 1948

Year 1949

Month	Discharge in Cusecs			Discharge for Month Acre Feet	Month	Discharge in Cusecs			Discharge per Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	..	..	..	..	Jan.	No records			440*
Feb.	..	..	..	..	Feb.	8	0	2	106
Mar.	..	..	..	..	Mar.	69	1.7	10	645
Apr.	..	..	..	..	Apr.	2.5	0.6	1	70
May	..	..	..	..	May	32	0.6	6	370
June	17	8	10	604	June	32	2.5	15	920
July	10	4	6	346	July	47	4	12	766
Aug.	6	2	4	246	Aug.	12	3	7	440
Sept.	7	0.8	3	172	Sept.	37	8	13	774
Oct.	20	1.5	4	240	Oct.	11	6	8	486
Nov.	8	1.7	3.5	210	Nov.	37	6	11	642
Dec.	No records			120*	Dec.	12	5	7	448
Totals	..	..	..	..	Totals	..	..	..	6,108*

Year 1950

Year 1951

Jan.	45	4.5	7	444	Jan.	17	4.5	8	517
Feb.	235	6	35	1,944	Feb.	166	5	38	2,140
Mar.	455	12	66	4,078	Mar.	32	10	16	946
Apr.	205	61	119	7,158	Apr.	10	8	9	554
May	104	37	62	3,848	May	9	6	7	414
June	200	39	84	5,022	June	255	5	27	1,612
July	100	48	65	4,080	July	19	9	13	790
Aug.	61	34	47	2,894	Aug.	16	8	10	632
Sept.	32	7	18	1,074	Sept.	127	6	16	948
Oct.	335	6	21	1,318	Oct.	118	10	18	1,124
Nov.	28	8	11	642	Nov.	12	6	8	506
Dec.	9	5	6	378	Dec.	9	5	6	348
Totals	..	..	..	32,880	Totals	..	..	..	10,531

\* Estimated.

RUTHERFORD CREEK AT SOLID CUTTING

Year 1952				Year 1953					
Month	Discharge in Cusecs			Discharge for Month Acre Feet	Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	4	1.7	3	204	Jan.	No Records			1,000*
Feb.	6	2.5	4	232	Feb.	12.5	8	9.9	552
Mar.	39	2.5	4	270	Mar.	11	5	7	460
Apr.	492	2.5	26	1,556	Apr.	5	3	4	258
May	95	10	17	1,036	May	No Records			3,450*
June	No Records			11,600*	June	9	7	7	446
July	"			1,600*	July	6	5	5	322
Aug.	"			2,650*	Aug.	No Records			1,850*
Sept.	"			620*	Sept.	"			260*
Oct.	"			2,400*	Oct.	"			240*
Nov.	"			1,300*	Nov.	4.25	0.4	1.6	93
Dec.	"			1,800*	Dec.	No Records			110*
Totals	..	..	..	25,268*	Totals	..	..	..	9,041*

Year 1954				Year 1955					
Jan.	No Records			140*	Jan.	6.8	0.5	1	60
Feb.	336	0.7	12.0	673	Feb.	54	0.8	5	280
Mar.	No Records			220*	Mar.	19.5	3.5	5.6	345
Apr.	"			130*	Apr.	271	2.6	5.7	344
May	"			120*	May	502	9.2	33	2,007
June	"			580*	June	14	6.5	8.8	528
July	"			130*	July	6.9	4.5	5.4	332
Aug.	"			120*	Aug.	4.3	3	3.6	221
Sept.	4	1.7	2.2	133	Sept.	3.6	2	2.5	150
Oct.	9.2	2.3	3.4	213	Oct.	9.5	1.9	2.8	175
Nov.	29	1.8	4.8	289	Nov.	2.3	1.2	1.6	95
Dec.	2.7	0.6	1.3	81	Dec.	17	0.6	2.3	144
Totals	..	..	..	2,829*	Totals	..	..	..	4,681

\* Estimated.

RUTHERFORD CREEK AT SOLID CUTTING.

Year 1956				Year 1957					
Month	Discharge in Cusecs			Discharge for Month Acre Feet	Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	18	0.45	1.8	112	Jan.	4.7	2.2	3.1	193
Feb.	422	0.9	42	2,424	Feb.	No records			190*
Mar.	192	23	48	2,974	Mar.	7.3	2	2.7	167
Apr.	51	11	17	1,042	Apr.	2	1.2	1.5	88
May	399	11	33	2,048	May	2.2	0.7	1.2	73
June	409	13.4	40	2,387	June	31	1.2	2.4	143
July	145	20	32	1,976	July	177	1.3	10.8	671
Aug.	21	9.5	14	853	Aug.	359	2.2	23	1,446
Sept.	No Records			460*	Sept.	No Records			575*
Oct.	"	"		720*	Oct.	"	"		300*
Nov.	"	"		310*	Nov.	"	"		210*
Dec.	17.6	3.4	4.7	293	Dec.	"	"		145*
Totals	..	..	..	15,599*	Totals	..	..	..	4,201*

Year 1958				Year 1959					
Jan.	No Records			182 *	Jan.	19	1.4	2.8	173
Feb.	127	2.8	12.1	678	Feb.	3.2	1.3	1.5	86
Mar.	22	3.5	5.5	341.	Mar.	111	1.8	7.4	461
Apr.	5.1	2.9	3.3	196	Apr.	86	3.2	6.8	408
May	6	2.5	2.9	179	May	3.2	2.5	2.8	174
June	133	2.2	5.5	328	June	215	2.5	11.1	664
July	No Records			366*	July	610	4	23	1,454
Aug.	"	"		205 *	Aug.	20	7.3	9.8	608
Sept.	7.1	2.2	2.9	176	Sept.	66	5.7	9.3	556
Oct.	4.9	1.4	2	125	Oct.	362	7.3	49	3,020
Nov.	8.6	1.3	1.7	100	Nov.	78	13	25	1,512
Dec.	5.6	1.3	1.7	107	Dec.	29	8.1	12.2	754
Totals	..	..	..	2,983*	Totals	..	..	..	9,870

\* Estimated.

RUTHERFORD CREEK AT SOLID CUTTING

Year 1960					Year 1961				
Month	Discharge in Cusecs			Discharge for Month Acre Feet	Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	4.2	6.3	10	624	Jan.	11	3.1	4.4	272
Feb.	10	4.9	5.7	332	Feb.	10.7	1.5	2.3	129
Mar.	29	3.7	5.7	352	Mar.	176	3.2	12.6	782
Apr.	5.4	3	3.6	214	Apr.	7.8	4.4	5.6	334
May	7.3	2.8	3.6	226	May	7.3	3.6	4.6	286
June	9.3	3	3.8	236	June	64	3.5	8.7	522
July	760	3.8	39	2,422	July	369	9.6	24	1,497
Aug.	12.7	5.9	8.9	552	Aug.	97	6.4	11.7	726
Sept.	71	5	13.7	826	Sept.	274	11.3	27	1,598
Oct.	32	5	7.3	452	Oct.	39	7.8	10	618
Nov.	6.4	3.8	4.8	286	Nov.	528	5	45	2,685
Dec.	98	3.8	11.6	720	Dec.	126	22	35	2,200
Totals	..	..	..	7,242	Totals	..	..	..	11,649
Year 1962					Year 1963				
Jan.	72	15	24	1,532	Jan.	30	8.0	9.2	573
Feb.	432	13.5	30	1,666	Feb.	37.8	7.0	10.0	615
Mar.	36	11	16	1,014	Mar.	109	6.0	16.8	1,043
Apr.	14.2	7.6	9.4	562	Apr.	772	7.4	26.2	1,575
May	13	5.6	7	431	May	439	20.5	43.8	2,718
June	5.6	4.5	5.1	306	June	342	16.6	36.5	2,188
July	55	4	19	472	July	68	12.9	22.2	1,376
Aug.	14	3.7	5.6	346	Aug.	63	8.8	12.2	759
Sept.	376	3.7	28	1,682	Sept.	70	7.7	11.6	698
Oct.	12.6	7	8.9	554	Oct.	67	6.7	10.4	643
Nov.	18	5.6	7.1	428	Nov.	103	6.4	10.0	600
Dec.	432	5.2	22	1,366	Dec.	304	6.0	26.6	1,650
Totals	..	..	..	10,359	Totals	..	..	..	14,438

RUTHERFORD CREEK AT SOLID CUTTING

Year 1964				Year 1965					
Month	Discharge in Cusecs			Discharge for Month Acre Feet	Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	11.3	6.4	8.3	517	Jan.	4.0	2.7	3.2	199
Feb.	10.3	5.2	6.1	351	Feb.	2.7	2.3	2.5	141
Mar.	20.0	4.0	5.2	323	Mar.	2.2	1.7	2.0	126
Apr.	21.9	4.0	17.3	1,037	Apr.	8.6	1.7	2.3	125
May	10.0	5.8	7.3	452	May	3.7	1.8	1.9	120
June	11.4	5.8	13.0	781	June	2.4	1.7	1.9	111
July	7.2	5.2	6.0	373	July	2.4	1.7	1.9	119
Aug.	43.9	4.9	21.7	1,344	Aug.	39.0	2.0	4.0	250
Sept.	19.0	6.9	9.7	584	Sept.	10.0	1.7	2.9	172
Oct.	15.8	5.5	7.0	436	Oct.	39.0	1.6	6.1	377
Nov.	25.5	4.5	5.8	346	Nov.	6.1	2.1	3.0	178
Dec.	4.8	3.9	4.2	262	Dec.	25.0	1.6	3.8	238
Totals	..	..	..	6,806	Totals	..	..	..	2,156

BEMBOKA RIVER AT MORAN'S CROSSING

LOCATION: Latitude 36° 40' Longitude 149° 39'

PERIOD OF ESTABLISHMENT: April 1943 to Date.

COMPLETE YEARS OF COMPUTED RECORDS: 22.

ZERO OF GAUGE: 64.97 Assumed Datum.

CATCHMENT AREA: 149 Square Miles.

CONTROL: Rock and gravel.

EQUIPMENT: Automatic Recorder (pressure type) installed, September, 1957.  
Staff gauge, range 0 to 25 feet.

CURRENT METER OBSERVATIONS:

(a) Number obtained	:	90
(b) Maximum observation in cusecs	:	3,107
(c) Minimum observation in cusecs		16

MAXIMUM ESTIMATED DISCHARGE DURING PERIOD OF RECORDS: 38,500 cusecs.

MEAN DAILY DISCHARGE DURING PERIOD OF RECORDS: 198 cusecs.

MEAN ANNUAL DISCHARGE FOR 22 YEARS: 147,300 acre feet.

REMARKS: Periods of missing records computed by correlation with Rutherford Creek and Tantawanglo Creek.

BEMBOKA RIVER AT MORANS CROSSING

Year 1943

Year 1944

Month	Discharge in Cusecs			Discharge for Month Acres-Feet	Month	Discharge in Cusecs			Discharge for Month Acres-Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	Records commenced				Jan.	89	27	54	3,342
Feb.	May 1943				Feb.	27	18	22	1,300
Mar.					Mar.	11	6	9	570
Apr.					Apr.	11	9.5	10	646
May	1220	7	92	5,696	May	1830	6	482	29,900
June	60	27	34	2,028	June	1220	11	274	17,000
July	27	22	25	1,540	July	11	4	10	616
Aug.	111	22	50	3,118	Aug.	4	2	3	166
Sept.	100	38	63	3,794	Sept.	4	2	3	160
Oct.	159	32	87	5,364	Oct.	3	2	10	664
Nov.	111	45	59	3,538	Nov.	32	27	28	1,680
Dec.	111	32	60	3,724	Dec.	No record			1,200 +
Totals	..	..	..	..	Totals	..	..	..	57,244 +

Year 1945

Year 1946

Jan.	No record			3,450 +	Jan.	45	11	14	1,062
Feb.	"	"		2,550 +	Feb.	45	11	25	1,374
Mar.	22	12	16	982	Mar.	197	18	31	1,920
Apr.	100	18	64	3,810	Apr.	38	18	23	1,374
May	95	0	19	1,188	May	42	18	23	1,434
June	5,020	0	581	34,848	June	3840	22	227	13,596
July	125	69	95	5,902	July	125	35	58	3,580
Aug.	74	52	60	3,744	Aug.	38	22	30	1,856
Sept.	52	41	46	2,746	Sept.	31	18	23	1,382
Oct.	295	30	54	3,366	Oct.	23	14	18	1,124
Nov.	45	27	37	2,234	Nov.	197	14	56	3,370
Dec.	52	18	26	1,630	Dec.	18	13	16	986
Totals	..	..	..	66,450 +	Totals	..	..	..	33,058

+ Estimated.

BEMBOKA RIVER AT MORAN'S CROSSING

Year 1947

Year 1948

Month	Discharge in Cusecs			Discharge for Month Acre-Feet	Month	Discharge in cusecs			Discharge for Month Acre-Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	18	14	17	1,080	Jan.	620	52	155	9,596
Feb.	5,900	18	275	15,386	Feb.	111	60	79	4,606
Mar.	159	18	48	3,006	Mar.	78	32	54	3,372
Apr.	515	4	114	6,868	Apr.	78	22	38	2,280
May	111	38	58	3,470	May	11,850	38	967	59,958
June	515	52	123	7,360	June	2,060	69	222	13,334
July	18	14	16	988	July	159	60	81	5,022
Aug.	32	14	16	1,012	Aug.	52	52	52	3,224
Sept.	22	18	20	1,216	Sept.	45	32	40	2,414
Oct.	27	18	19	1,198	Oct.	177	32	82	4,914
Nov.	60	18	25	1,520	Nov.	35	29	32	1,920
Dec.	980	48	253	15,656	Dec.	197	0	27	1,696
Totals	..	..	..	58,760	Totals	..	..	..	112,336

Year 1949

Year 1950

Jan.	211	38	104	6,434	Jan.	860	45	96	5,926
Feb.	89	38	41	2,292	Feb.	7380	60	1078	60,344
Mar.	1900	32	261	16,176	Mar.	No Record			75,700 +
Apr.	45	22	29	1,768	Apr.	5900	280	1888	113,266
May	593	45	97	6,040	May	565	207	290	17,990
June	2300	32	721	43,272	June	1620	141	404	24,262
July	141	111	121	7,486	July	390	217	275	17,046
Aug.	141	78	100	6,226	Aug.	1160	141	228	14,142
Sept.	1340	73	161	9,648	Sept.	159	95	116	6,950
Oct.	111	60	79	4,904	Oct.	7780	87	468	29,028
Nov.	390	52	97	5,842	Nov.	565	111	185	11,110
Dec.	159	45	78	4,856	Dec.	177	83	100	6,220
Totals	..	..	..	114,944	Totals	..	..	..	381,984 +

+ Estimated.



BEMBOKA RIVER AT MORAN'S CROSSING.

Year 1951				Year 1952					
Month	Discharge in Cusecs			Discharge for Month Acre Feet	Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	800	69	169	10,474	Jan.	76	43	55	3,428
Feb.	9610	78	1030	57,686	Feb.	84	38	47	2,710
Mar.	No records.			78,500*	Mar.	980	38	96	5,948
Apr.	111	78	97	5,988	Apr.	6380	48	602	37,298
May	100	78	90	5,560	May	740	114	197	12,242
June	3230	75	455	27,282	June	38500	94	2748	170,368
July	229	103	143	8,834	July	1540	187	385	23,882
Aug.	860	89	169	10,462	Aug.	1160	240	626	38,840
Sept.	3840	89	496	29,776	Sept.	217	111	147	9,144
Oct.	No records.			16,800*	Oct.	20000	97	810	50,190
Nov.	133	78	97	5,802	Nov.	1950	159	317	19,004
Dec.	100	60	70	4,320	Dec.	1950	111	433	26,858
Totals	..	..	..	261,484*	Totals	..	..	..	399,912

Year 1953				Year 1954					
Jan.	640	133	244	15,110	Jan.	69	22	32	2,010
Feb.	265	106	160	8,942	Feb.	11830c	32	323	18,108
Mar.	177	89	108	6,704	Mar.	89	35	53	3,286
Apr.	94	65	75	4,518	Apr.	35	32	33	1,974
May	29020	65	815	50,530	May	32	27	28	1,742
June	150	100	114	6,858	June	1950	27	143	8,578
July	94	76	83	5,168	July	35	27	32	1,956
Aug.	No records.			27,000*	Aug.	30	27	29	1,799
Sept.	74	56	62	3,844	Sept.	25	20	22	1,307
Oct.	100	48	57	3,508	Oct.	111	14	26	1,642
Nov.	74	38	48	2,904	Nov.	217	35	62	3,732
Dec.	32	20	26	1,634	Dec.	60	14	27	1,678
Totals	..	..	..	136,720*	Totals	..	..	..	47,812

\* Estimated.

BEMBOKA RIVER AT MORAN'S CROSSING.

Year 1955				Year 1956					
Month	Discharge in Cusecs			Discharge for Month Acre Feet	Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	52	8	14	882	Jan.	No records.			3,550*
Feb.	No records.			2,200*	Feb.	33060	27	2056	119,274
Mar.	"	"		9,200*	Mar.	2800	295	927	57,466
Apr.	"	"		1,800*	Apr.	680	141	260	15,600
May	"	"		21,300*	May	No records.			59,100*
June	"	"		4,550*	June	"	"		83,400*
July	"	"		3,300*	July	"	"		37,700*
Aug.	"	"		2,600*	Aug.	"	"		15,600*
Sept.	48	32	38	2,287	Sept.	"	"		6,800*
Oct.	240	27	48	2,988	Oct.	"	"		10,600*
Nov.	27	20	23	1,396	Nov.	87	69	76	4,554
Dec.	No records.			2,600*	Dec.	No records.			5,100*
Totals	..	..	..	55,103*	Totals	..	..	..	418,744*

Year 1957				Year 1958					
Jan.	No records			3,150*	Jan.	No records.			4,200*
Feb.	"	"		2,850*	Feb.	"	"		9,200*
Mar.	38	22	29	1,798	Mar.	"	"		5,600*
Apr.	No records			2,750*	Apr.	"	"		3,950*
May	"	"		2,600*	May	"	"		3,700*
June	"	"		3,800*	June	1640	29	69	4,122
July	"	"		14,200*	July	No records.			4,500*
Aug.	"	"		25,700*	Aug.	"	"		2,550*
Sept.	"	"		6,600*	Sept.	"	"		3,050*
Oct.	295	56	119	7,388	Oct.	35	18	25	1,528
Nov.	78	30	49	2,952	Nov.	69	8	18	1,056
Dec.	30	22	27	1,692	Dec.	69	14	25	1,572
Totals	..	..	..	75,480*	Totals	..	..	..	45,028*

\* Estimated.

BEMBOKA RIVER AT MORAN'S CROSSING

Year 1959

Year 1960

Month	Discharge in Cusecs			Discharge for Month Acre Feet	Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	60	16	27	1,672	Jan.	No record			9,300*
Feb.	32	14	23	1,276	Feb.	"	"		4,950*
Mar.	730	41	82	5,068	Mar.	"	"		4,750*
Apr.	457	38	57	3,406	Apr.	65	52	57	3,448
May	38	38	38	2,356	May	89	45	56	3,480
June	1190	38	99	5,922	June	65	42	52	3,106
July	13780	60	430	26,680	July	No record			36,900*
Aug.	203	62	96	5,942	Aug.	"	"		8,300*
Sept.	227	60	78	4,662	Sept.	"	"		11,600*
Oct.	13780	100	775	48,022	Oct.	"	"		6,800*
Nov.	No record			22,800*	Nov.	"	"		4,050*
Dec.	"	"		12,100*	Dec.	"	"		11,100*
Totals	..	..	..	139,906*	Totals	..	..	..	107,784*

Year 1961

Year 1962

Jan.	No record			5,500*	Jan.	No record			21,300*
Feb.	"	"		2,300*	Feb.	"	"		25,900*
Mar.	"	"		21,700*	Mar.	"	"		13,700*
Apr.	"	"		5,250*	Apr.	"	"		7,500*
May	"	"		4,350*	May	"	"		6,100*
June	1040	78	141	8,432	June	"	"		4,300*
July	5300	118	446	27,646	July	206	44	69	4,264
Aug.	1655	94	180	11,162	Aug.	No record			4,100*
Sept.	No record			31,200*	Sept.	5160	27	347	20,804
Oct.	"	"		8,100*	Oct.	No record			7,000*
Nov.	16610	84	979	58,764	Nov.	"	"		5,300*
Dec.	No record			37,500*	Dec.	5450	55	342	21,200
Totals	..	..	..	221,904*	Totals	..	..	..	141,468*

\* Estimated.

BEMBOKA RIVER AT MORAN'S CROSSING.

Year 1963					Year 1964				
Month	Discharge in Cusecs			Discharge for Month Acre Feet	Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	950	76	118	7,362	Jan.	No record			6,700*
Feb.	362	99	134	7,524	Feb.	"	"		4,300*
Mar.	No record			12,800*	Mar.	"	"		4,600*
Apr.	23400	53	488	29,298	Apr.	11550	53	427	25,622
May	13340	211	951	58,940	May	163	96	121	7,522
June	4,770	250	497	29,816	June	1,020	89	175	10,484
July	4,350	198	372	22,526	July	132	82	109	6,752
Aug.	1,070	108	164	10,072	Aug.	5,365	42	329	20,400
Sept.	1,000	96	144	8,660	Sept.	No record			10,800*
Oct.	263	96	155	9,638	Oct.	125	38	76	4,688
Nov.	790	102	144	8,664	Nov.	125	28	60	3,596
Dec.	4,855	108	426	26,398	Dec.	103	28	52	3,226
Totals	..	..	..	231,698*	Totals	..	..	..	108,690*

Year 1965				
Jan.	64	18	39	2,400
Feb.	42	7	30	1,656
Mar.	76	12	32	1,972
Apr.	35	10	23	1,410
May	76	10	45	2,798
June	28	4	23	1,410
July	76	14	32	1,976
Aug.	163	10	37	2,314
Sept.	64	7	23	1,402
Oct.	224	7	36	2,300
Nov.	44	13	29	1,718
Dec.	235	8	32	1,984
Totals	..	..	..	23,340

\* Estimated.

TANTAWANGLO CREEK AT TANTAWANGLO SCHOOL

LOCATION: Latitude 36° 46' Longitude 149° 38'.

PERIOD OF ESTABLISHMENT: April, 1943 to date.

COMPLETE YEARS OF COMPUTED RECORDS: 22.

ZERO OF GAUGE: Approximately 290 feet above mean sea level.

CATCHMENT AREA: 65 square miles.

CONTROL: Rock and gravel.

EQUIPMENT: Staff gauge, range 0 to 15 feet.

CURRENT METER OBSERVATIONS:

(a) Number obtained	:	96
(b) Maximum observation in cusecs.	:	620
(c) Minimum observation in cusecs	:	5.7

MAXIMUM ESTIMATED DISCHARGE DURING PERIOD OF RECORDS: 16,200 cusecs.

MEAN DAILY DISCHARGE DURING PERIOD OF RECORDS: 78 cusecs.

MEAN ANNUAL DISCHARGE FOR 22 YEARS: 58,700 acre feet.

REMARKS: Periods of missing records computed by correlation with Tantawanglo Creek at Tantawanglo Dam Site and Bemboka River.

TANTAWANGLO CREEK AT TANTAWANGLO SCHOOL

Year 1943					Year 1944				
Month	Discharge in Cusecs			Discharge for Month Acre Feet	Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	..	..	..	..	Jan.	14	7	10	594
Feb.	..	..	..	..	Feb.	8	3	4	254
Mar.	..	..	..	..	Mar.	2	3	2.5	152
Apr.	..	..	..	..	Apr.	19	2	6	382
May	42	3	10	598	May	4950	5	238	14,780
June	9	7	8	472	June	85	29	44	2,626
July	7	5	6	364	July	42	24	27	1,690
Aug.	35	4	18	1,072	Aug.	29	19	21	1,304
Sept.	27	9	15	838	Sept.	17	14	15	928
Oct.	50	9	19	1,216	Oct.	22	12	14	875
Nov.	19	9	12	737	Nov.	12	8	10	594
Dec.	50	9	20	1,232	Dec.	12	5	8	470
Totals	..	..	..	..	Totals	..	..	..	24,649

Year 1945					Year 1946				
Jan.	154	5	22	1,368	Jan.	35	4	8	509
Feb.	272	10	18	1,018	Feb.	32	5	12	662
Mar.	12	7	9	576	Mar.	24	7	10	637
Apr.	1420	10	42	2,540	Apr.	12	7	8	506
May	29	14	16	998	May	27	7	9	558
June	1666	12	114	6,804	June	736	8	55	3,240
July	35	24	27	1,680	July	39	14	20	1,237
Aug.	24	15	20	1,262	Aug.	15	9	12	731
Sept.	15	13	15	882	Sept.	14	8	10	574
Oct.	35	10	15	910	Oct.	12	7	8	508
Nov.	24	9	13	794	Nov.	218	6	35	2,074
Dec.	15	7	10	624	Dec.	19	9	14	853
Totals	..	..	..	19,456	Totals	..	..	..	12,089

TANTAWANGLO CREEK AT TANTAWANGLO SCHOOL.

Year 1947

Year 1948

Month	Discharge in Cusecs			Discharge for Month Acre-Feet	Month	Discharge in Cusecs			Discharge for Month Acre-Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	9	5	7	454	Jan.	80	24	41	2,532
Feb.	102	5	16	913	Feb.	112	24	44	2,574
Mar.	35	9	13	794	Mar.	39	19	25	1,524
Apr.	154	8	27	1,642	Apr.	55	19	25	1,508
May	19	10	13	829	May	6040	24	203	12,604
June	21	9	11	657	June	356	35	66	3,984
July	9	7	8	524	July	45	35	40	2,454
Aug.	15	7	9	543	Aug.	35	27	30	1,850
Sept.	9	5	7	406	Sept.	32	19	24	1,432
Oct.	9	3	5	326	Oct.	46	17	23	1,427
Nov.	112	5	13	800	Nov.	24	15	18	1,100
Dec.	321	13	77	4,750	Dec.	42	9	14	882
Totals	..	..	..	12,638	Totals	..	..	..	33,871

Year 1949

Year 1950

Jan.	No records			1,280 <sup>+</sup>	Jan.	174	37	49	3,024
Feb.	134	11	20	1,134	Feb.	3276	44	301	16,854
Mar.	898	14	68	4,214	Mar.	3234	84	358	22,204
Apr.	25	17	21	1,260	Apr.	9550	134	459	27,540
May	164	17	34	2,136	May	304	104	124	7,680
June	2944	25	222	13,326	June	448	84	133	8,012
July	410	62	107	6,608	July	174	96	106	6,600
Aug.	90	49	65	4,010	Aug.	242	84	103	6,402
Sept.	338	44	73	4,358	Sept.	84	62	70	4,212
Oct.	96	40	50	3,130	Oct.	448	53	101	6,276
Nov.	1060	40	108	6,462	Nov.	338	62	90	5,394
Dec.	84	44	62	3,832	Dec.	62	53	56	3,502
Totals	..	..	..	51,750 <sup>+</sup>	Totals	..	..	..	117,700

<sup>+</sup> Estimated.

TANTAWANGLO CREEK AT TANTAWANGLO SCHOOL.

Year 1951

Year 1952

Month	Discharge in Cusecs			Discharge for Month Acre-Feet	Month	Discharge in Cusecs			Discharge for Month Acre-Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	84	44	52	3,234	Jan.	53	30	37	2,284
Feb.	4750	37	450	25,198	Feb.	154	30	35	2,034
Mar.	218	84	110	6,820	Mar.	108	25	34	2,100
Apr.	73	62	67	4,050	Apr.	1798	95	198	11,898
May	62	53	55	3,394	May	118	53	71	4,374
June	1060	44	156	9,354	June	12330	53	973	58,392
July	118	62	87	5,394	July	338	134	185	11,492
Aug.	448	62	107	6,646	Aug.	338	100	172	10,712
Sept.	844	62	129	7,718	Sept.	100	70	78	4,684
Oct.	242	73	107	6,654	Oct.	7360	50	446	27,348
Nov.	73	53	65	3,916	Nov.	1798	118	219	13,156
Dec.	62	44	47	2,944	Dec.	684	118	191	11,870
Totals	..	..	..	85,322	Totals	..	..	..	160,344

Year 1953

Year 1954

Jan.	134	84	111	6,880	Jan.	43	15	21	1,300
Feb.	116	70	92	5,176	Feb.	4180	18	158	8,844
Mar.	70	59	60	3,724	Mar.	31	18	23	1,414
Apr.	59	37	47	2,844	Apr.	18	18	18	1,080
May	3234	37	258	16,026	May	18	15	17	1,038
June	70	50	62	3,710	June	59	15	20	1,208
July	50	43	48	2,946	July	18	15	15	948
Aug.	59	37	51	3,154	Aug.	15	12	15	906
Sept.	37	31	34	2,064	Sept.	12	12	12	720
Oct.	No record			1,400 <sup>+</sup>	Oct.	18	9	12	714
Nov.	31	22	26	1,550	Nov.	59	15	19	1,112
Dec.	No record			647 <sup>+</sup>	Dec.	26	9	13	796
Totals	..	..	..	50,121 <sup>+</sup>	Totals	..	..	..	20,080

<sup>+</sup> Estimated.



TANTAWANGLO CREEK AT TANTAWANGLO SCHOOL.

Year 1955

Year 1956

Month	Discharge in Cusecs			Discharge for Month Acre-Feet	Month	Discharge in Cusecs			Discharge for Month Acre-Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	9	5	6	354	Jan.	70	12	23	1,404
Feb.	84	5	16	880	Feb.	16200	15	758	43,980
Mar.	18	12	14	882	Mar.	850	140	403	24,980
Apr.	15	12	13	750	Apr.	300	87	132	7,932
May	2212	18	136	8,432	May	3910	87	377	23,390
June	37	26	30	1,812	June	7360	91	424	25,438
July	26	18	21	1,308	July	1798	134	241	14,948
Aug.	18	15	17	1,038	Aug.	134	87	100	6,182
Sept.	15	12	14	828	Sept.	87	64	77	4,594
Oct.	22	12	16	1,016	Oct.	338	54	88	5,430
Nov.	15	9	12	726	Nov.	54	45	47	2,808
Dec.	50	9	17	1,030	Dec.	36	28	33	2,024
Totals	..	..	..	19,056	Totals	..	..	..	163,110

Year 1957

Year 1958

Jan.	28	20	20	1,256	Jan.	64	8	18	1,136
Feb.	20	20	20	1,120	Feb.	174	20	44	2,472
Mar.	20	20	20	1,240	Mar.	54	20	24	1,518
Apr.	20	16	18	1,080	Apr.	20	16	18	1,064
May	20	16	17	1,024	May	16	16	16	992
June	87	16	25	1,496	June	736	16	41	2,476
July	1300	16	91	5,612	July	194	20	39	2,418
Aug.	2210	16	164	10,164	Aug.	20	16	19	1,200
Sept.	No records			2,600 <sup>+</sup>	Sept.	28	16	21	1,264
Oct.	36	20	29	1,768	Oct.	28	16	18	1,128
Nov.	20	16	18	1,080	Nov.	16	12	14	832
Dec.	36	16	17	1,080	Dec.	36	16	17	1,064
Totals	..	..	..	29,520 <sup>+</sup>	Totals	..	..	..	17,564

<sup>+</sup> Estimated.

TANTAWANGLO CREEK AT TANTAWANGLO SCHOOL.

Year 1959

Year 1960

Month	Discharge in Cusecs			Discharge for Month Acre-Feet	Month	Discharge in Cusecs			Discharge for Month Acre-Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	45	12	17	1,034	Jan.	91	36	65	4,006
Feb.	16	8	10	536	Feb.	28	20	24	1,384
Mar.	736	20	61	3,808	Mar.	87	28	46	2,824
Apr.	174	20	47	2,842	Apr.	36	28	32	1,920
May	20	18	19	1,212	May	118	28	34	2,110
June	272	16	34	2,052	June	75	28	32	1,908
July	898	28	92	5,690	July	4550	28	227	14,090
Aug.	75	28	41	2,564	Aug.	64	45	52	3,228
Sept.	118	28	46	2,732	Sept.	194	54	97	5,792
Oct.	8770	45	638	39,572	Oct.	87	45	58	3,602
Nov.	580	118	197	11,792	Nov.	45	36	41	2,448
Dec.	134	87	109	6,776	Dec.	338	36	75	4,646
Totals	..	..	..	80,610	Totals	..	..	..	47,958

Year 1961

Year 1962

Jan.	45	28	35	2,142	Jan.	180	103	153	9,464
Feb.	36	28	29	1,616	Feb.	370	103	147	8,238
Mar.	790	28	109	6,726	Mar.	120	74	100	6,194
Apr.	75	36	51	3,066	Apr.	74	62	70	4,176
May	45	36	37	2,286	May	74	52	61	3,768
June	45	28	36	2,152	June	52	44	49	2,912
July	1420	28	162	10,072	July	62	37	46	2,834
Aug.	194	50	66	4,114	Aug.	103	37	42	2,602
Sept.	1480	75	212	12,738	Sept.	1666	31	125	7,514
Oct.	101	64	77	4,780	Oct.	56	37	42	2,576
Nov.	7470	54	685	41,076	Nov.	56	26	35	2,086
Dec.	6783	158	516	31,964	Dec.	145	26	61	3,794
Totals	..	..	..	122,732	Totals	..	..	..	56,158

TANTAWANGLO CREEK AT TANTAWANGLO SCHOOL.

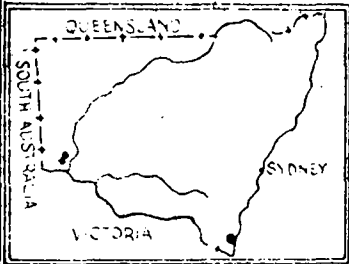
Year 1963

Year 1964

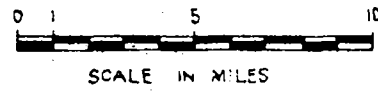
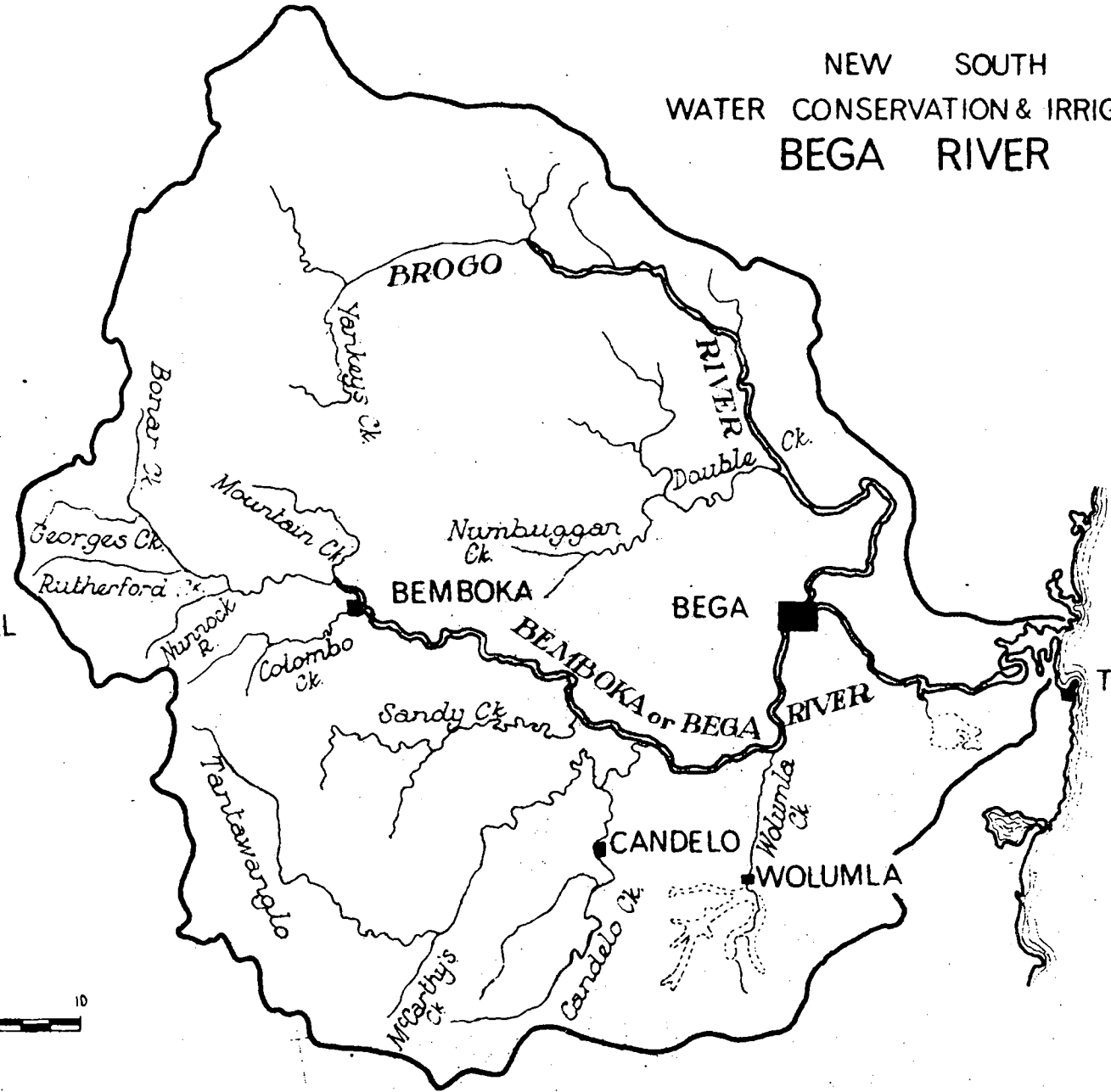
Month	Discharge in Cusecs			Discharge for Month Acre-Feet	Month	Discharge in Cusecs			Discharge for Month Acre-Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	93	37	43	2,678	Jan.	56	37	48	2,946
Feb.	93	37	56	3,112	Feb.	37	30	35	2,020
Mar.	191	31	51	3,182	Mar.	37	30	32	1,986
Apr.	1420	31	98	5,902	Apr.	8530	30	398	23,864
May	1360	93	250	15,522	May	93	56	70	4,346
June	2665	125	415	24,886	June	109	46	69	4,118
July	580	109	170	10,534	July	67	46	51	3,180
Aug.	109	67	85	5,284	Aug.	3910	30	178	11,038
Sept.	109	56	77	4,630	Sept.	109	56	71	4,274
Oct.	67	56	60	3,736	Oct.	56	37	44	2,716
Nov.	191	46	64	3,854	Nov.	56	37	44	2,628
Dec.	736	46	100	6,218	Dec.	37	24	31	1,932
Totals	..	..	..	89,538	Totals	..	..	..	65,048

Year 1965

Jan.	30	18	22	1,356
Feb.	18	13	17	928
Mar.	13	8	12	766
Apr.	18	8	11	670
May	13	13	13	806
June	18	8	11	650
July	13	8	12	746
Aug.	109	13	22	1,368
Sept.	30	8	13	808
Oct.	30	8	13	840
Nov.	24	8	13	782
Dec.	448	13	42	2,594
Totals	..	..	..	12,314



NEW SOUTH WALES  
WATER CONSERVATION & IRRIGATION COMMISSION  
BEGA RIVER BASIN



SCALE IN MILES

FIGURE 1

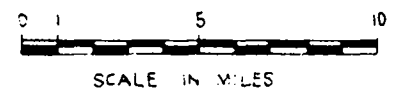
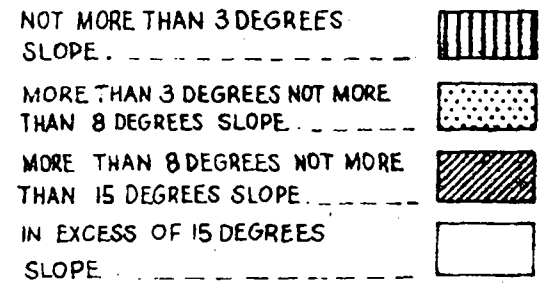
NEW SOUTH WALES  
 WATER CONSERVATION & IRRIGATION COMMISSION  
**BEGA RIVER BASIN**  
**LAND SLOPES**

36° 40'

149° 30'

150°

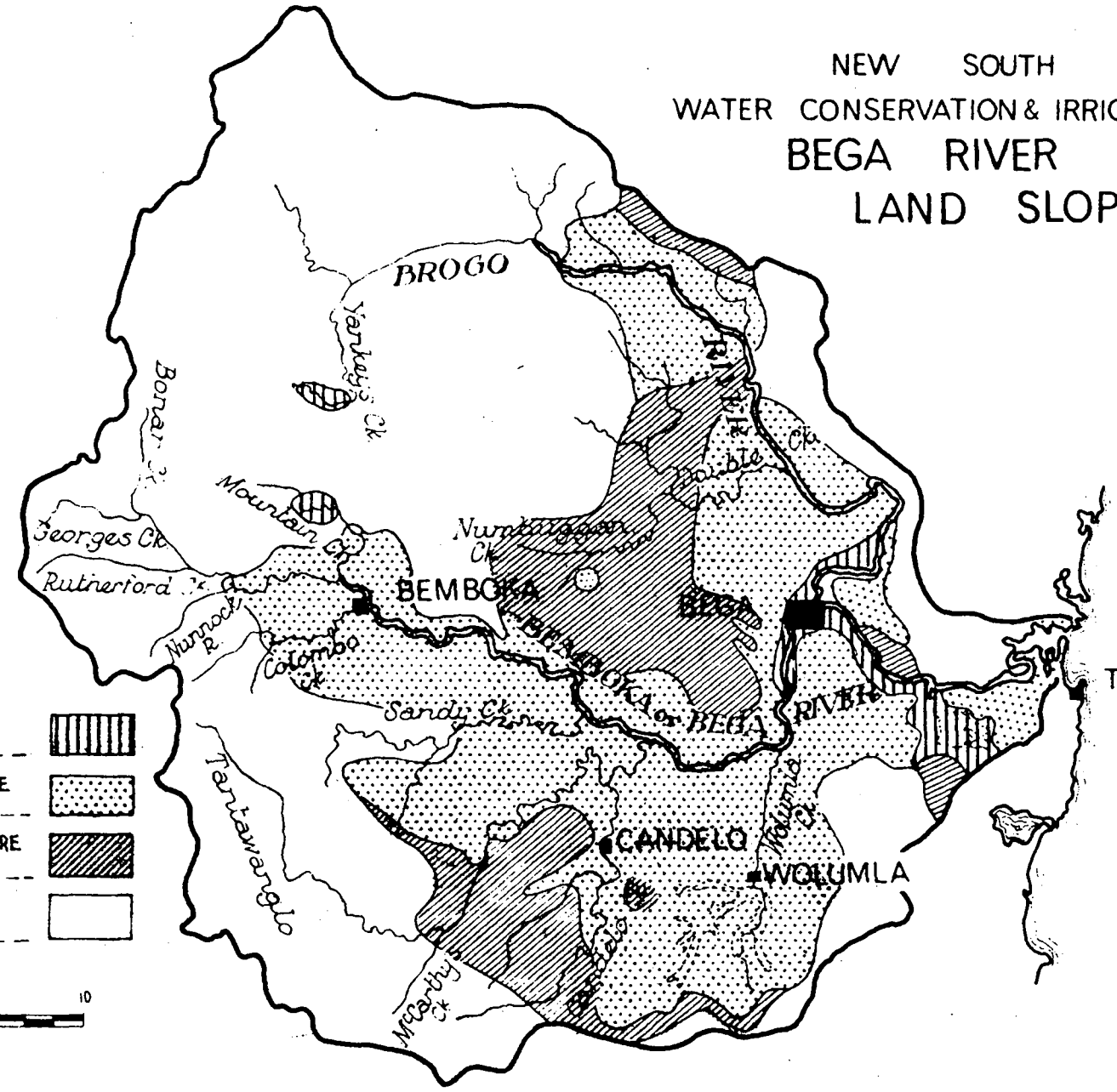
36° 50'



36° 50'

149° 30'

150°



PACIFIC OCEAN

FIGURE 2

36° 50'

NEW SOUTH WALES  
 WATER CONSERVATION & IRRIGATION COMMISSION  
**BEGA RIVER BASIN**  
**GEOLOGICAL FORMATIONS**

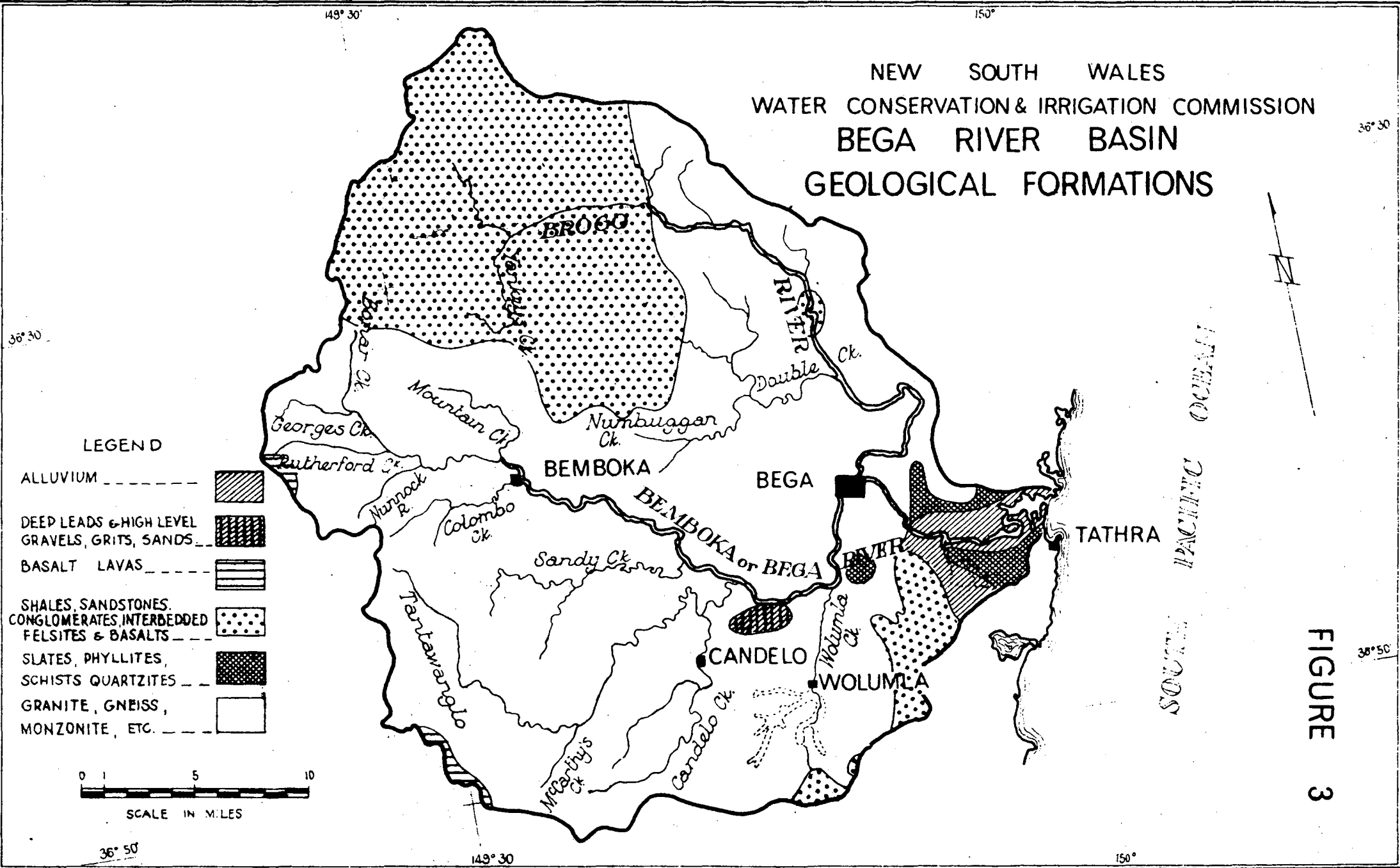


FIGURE 3

# BEGA RIVER BASIN JANUARY MEDIAN RAINFALL

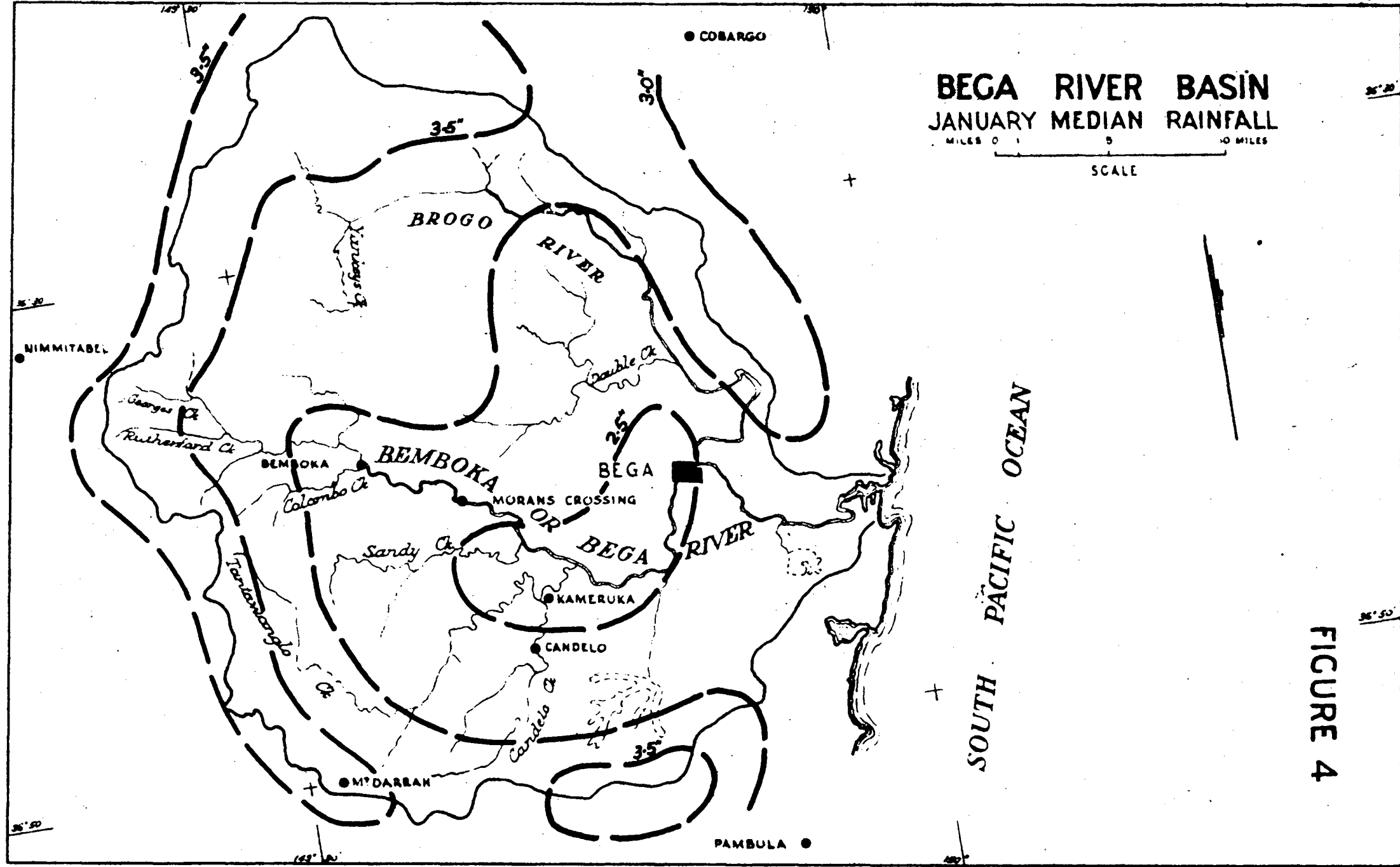
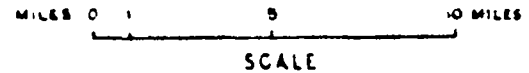


FIGURE 4

# BEGA RIVER BASIN FEBRUARY MEDIAN RAINFALL

MILES 0 5 10 MILES

SCALE

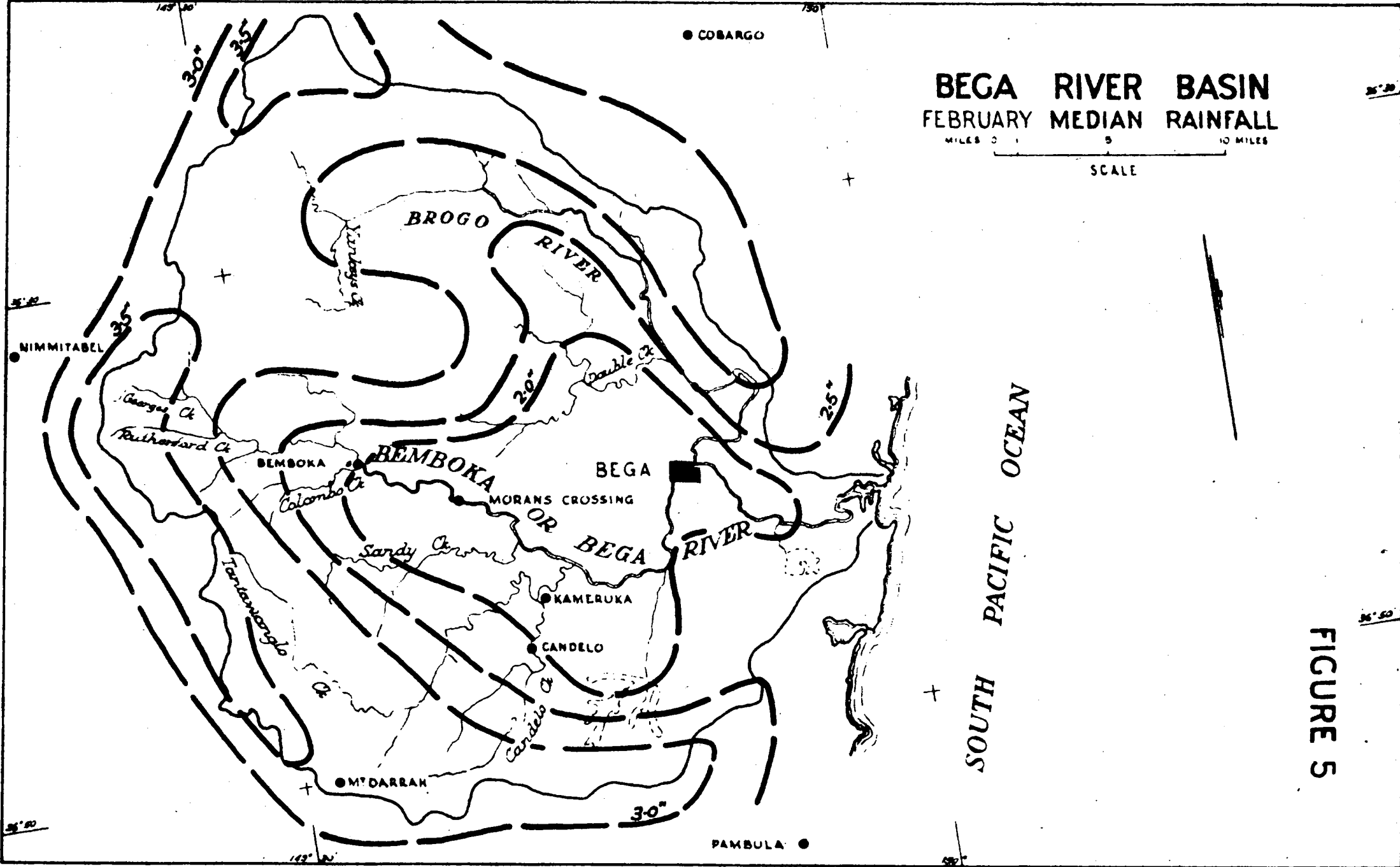


FIGURE 5



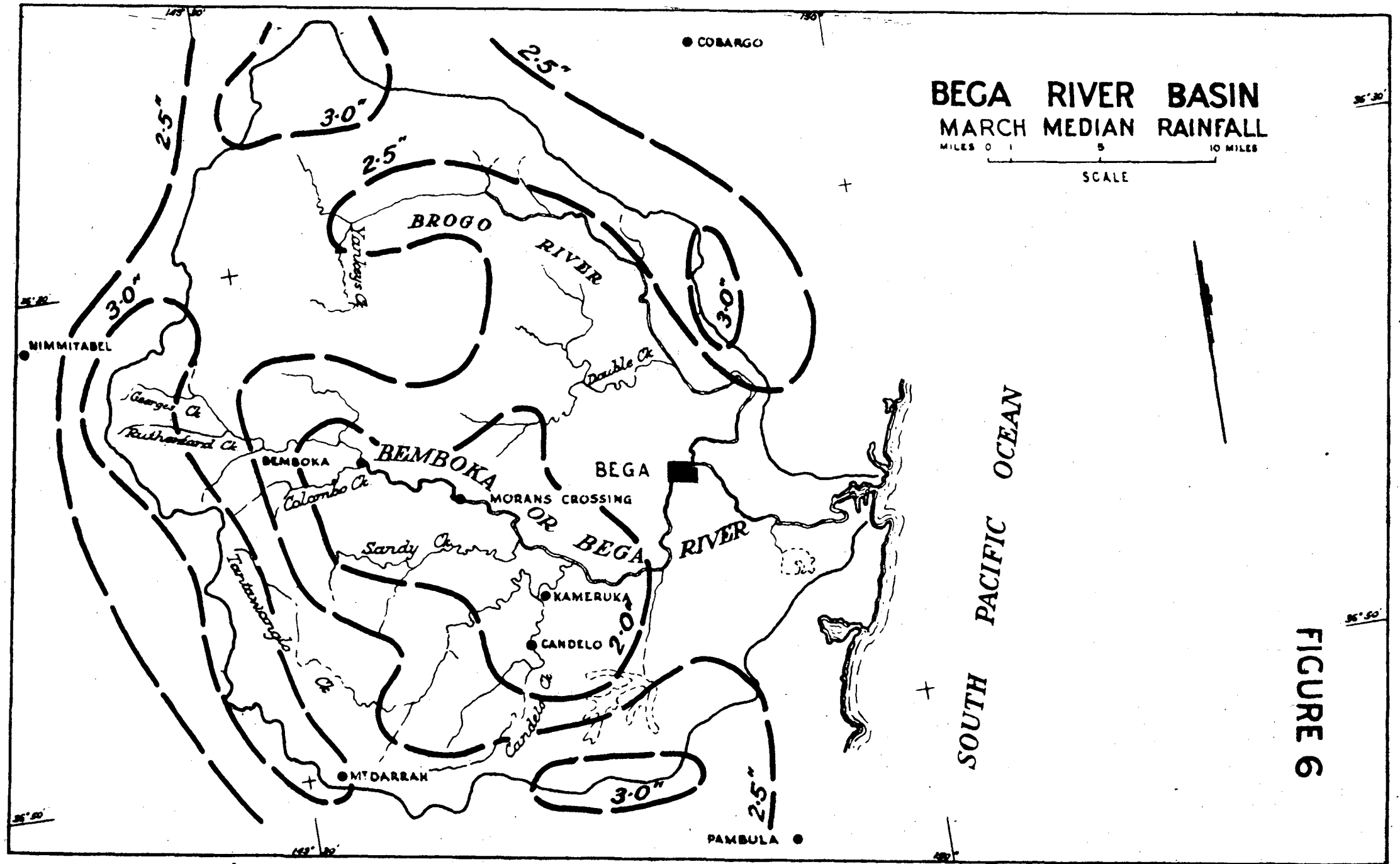


FIGURE 6

# BEGA RIVER BASIN APRIL MEDIAN RAINFALL

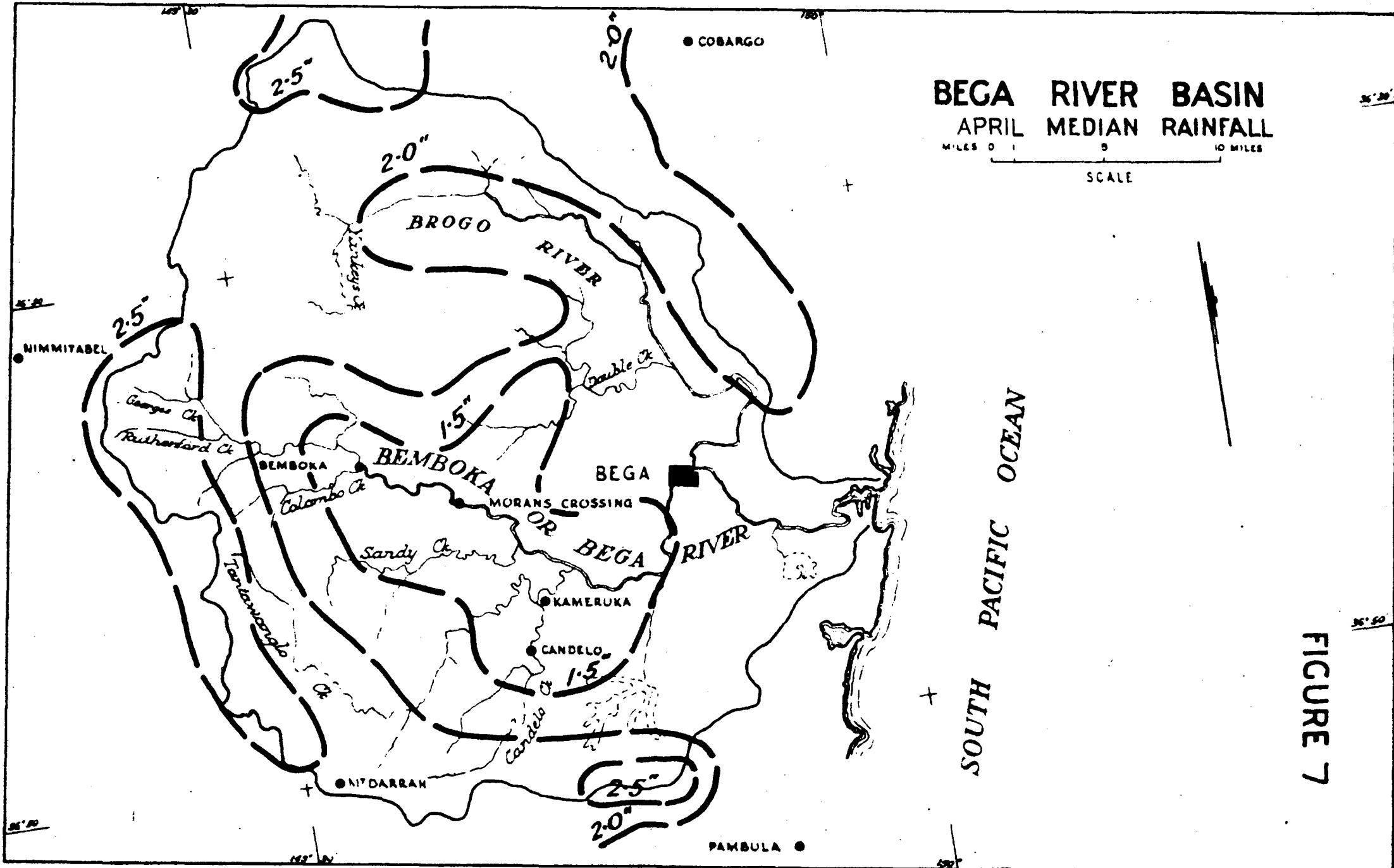
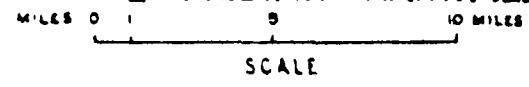


FIGURE 7

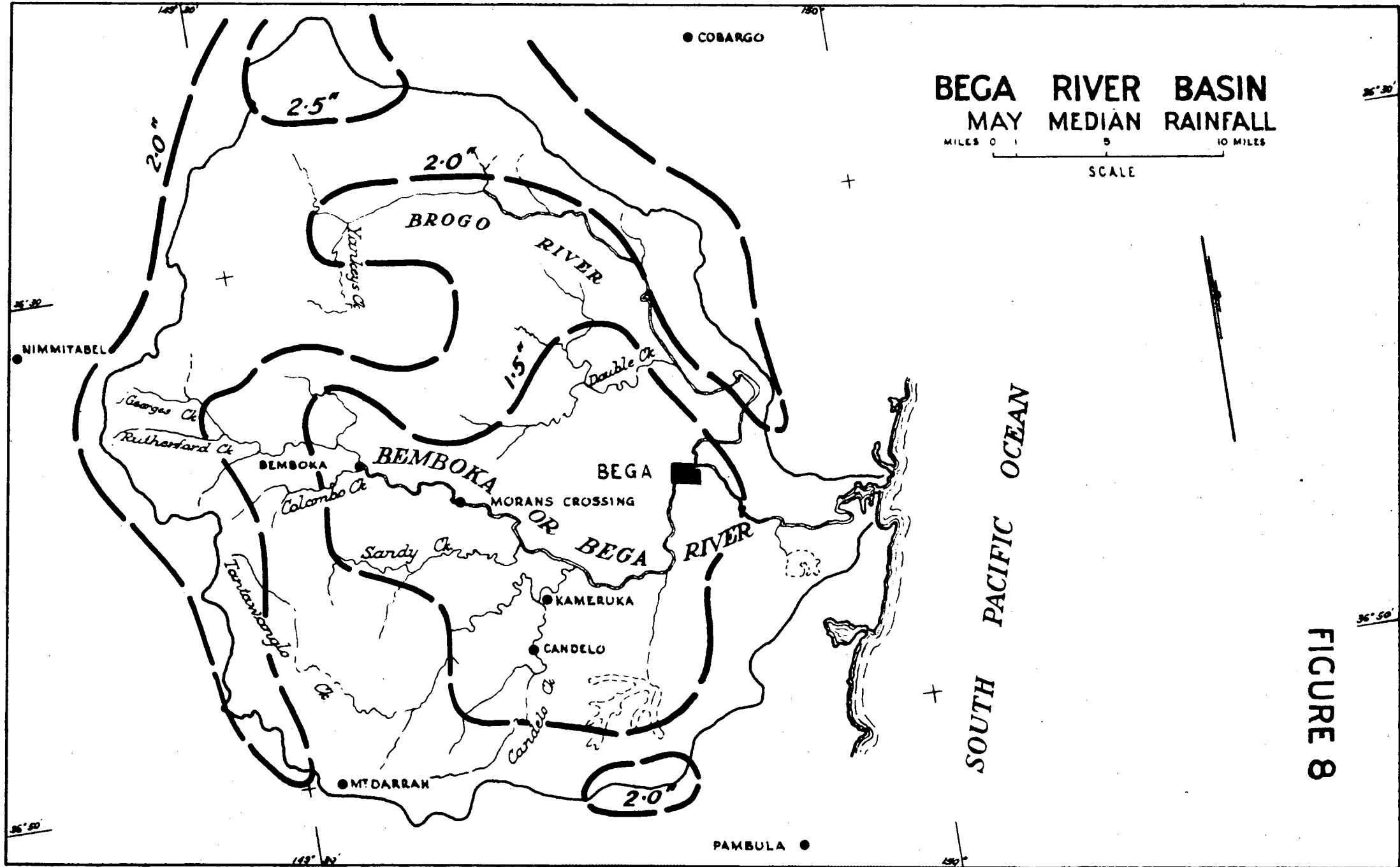


FIGURE 8

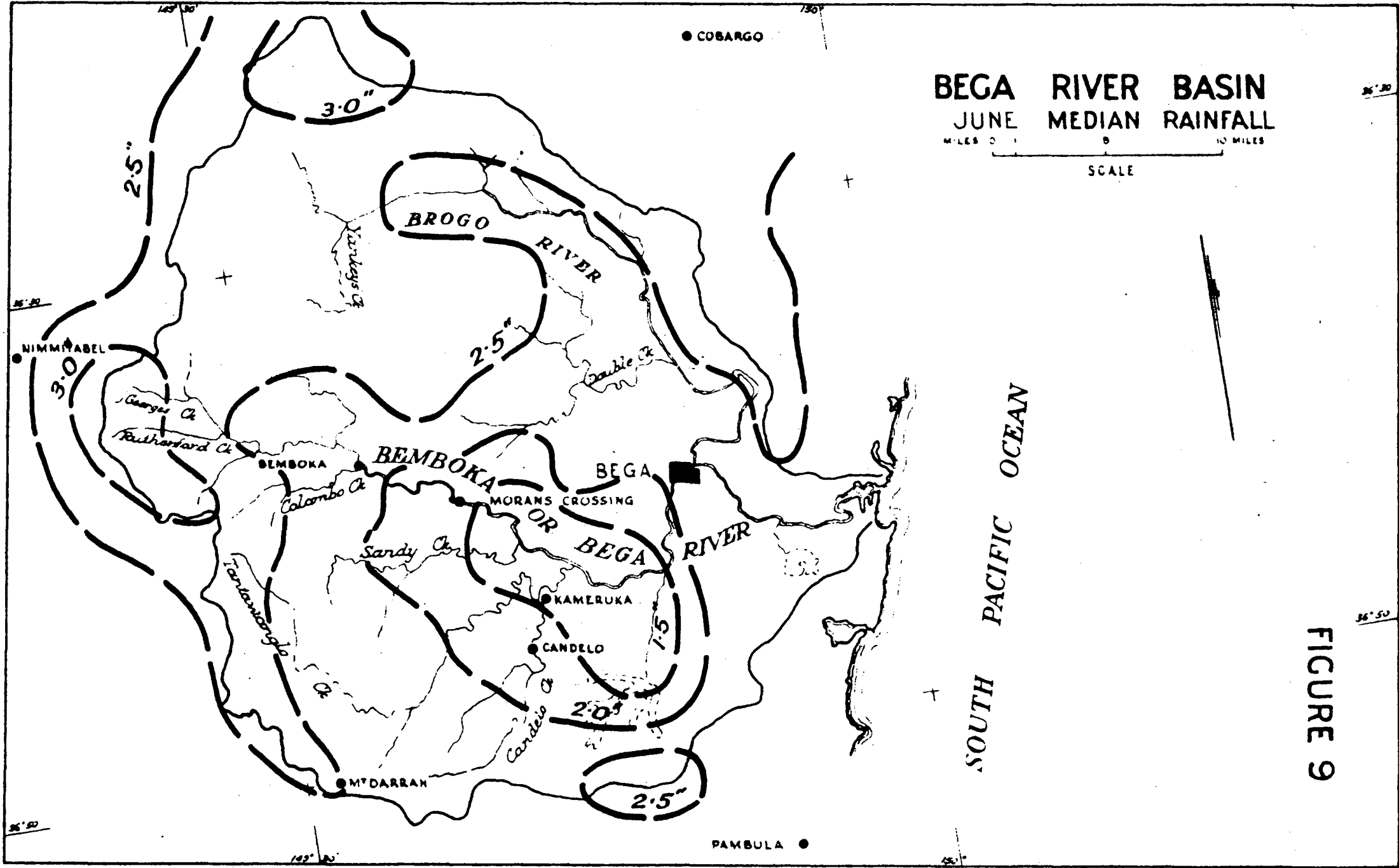


FIGURE 9

# BEGA RIVER BASIN JULY MEDIAN RAINFALL

MILES 0 1 5 10 MILES

SCALE

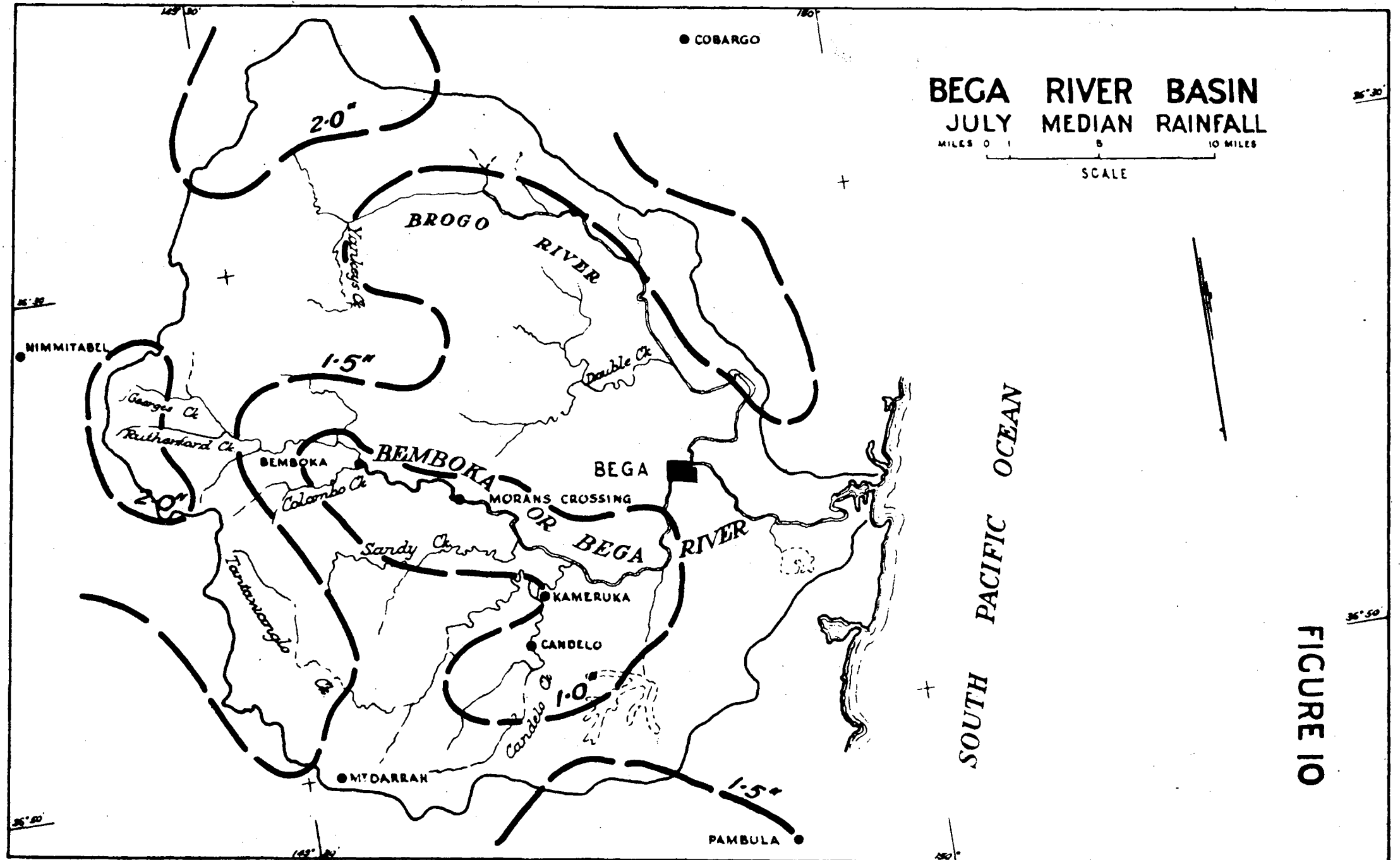


FIGURE 10

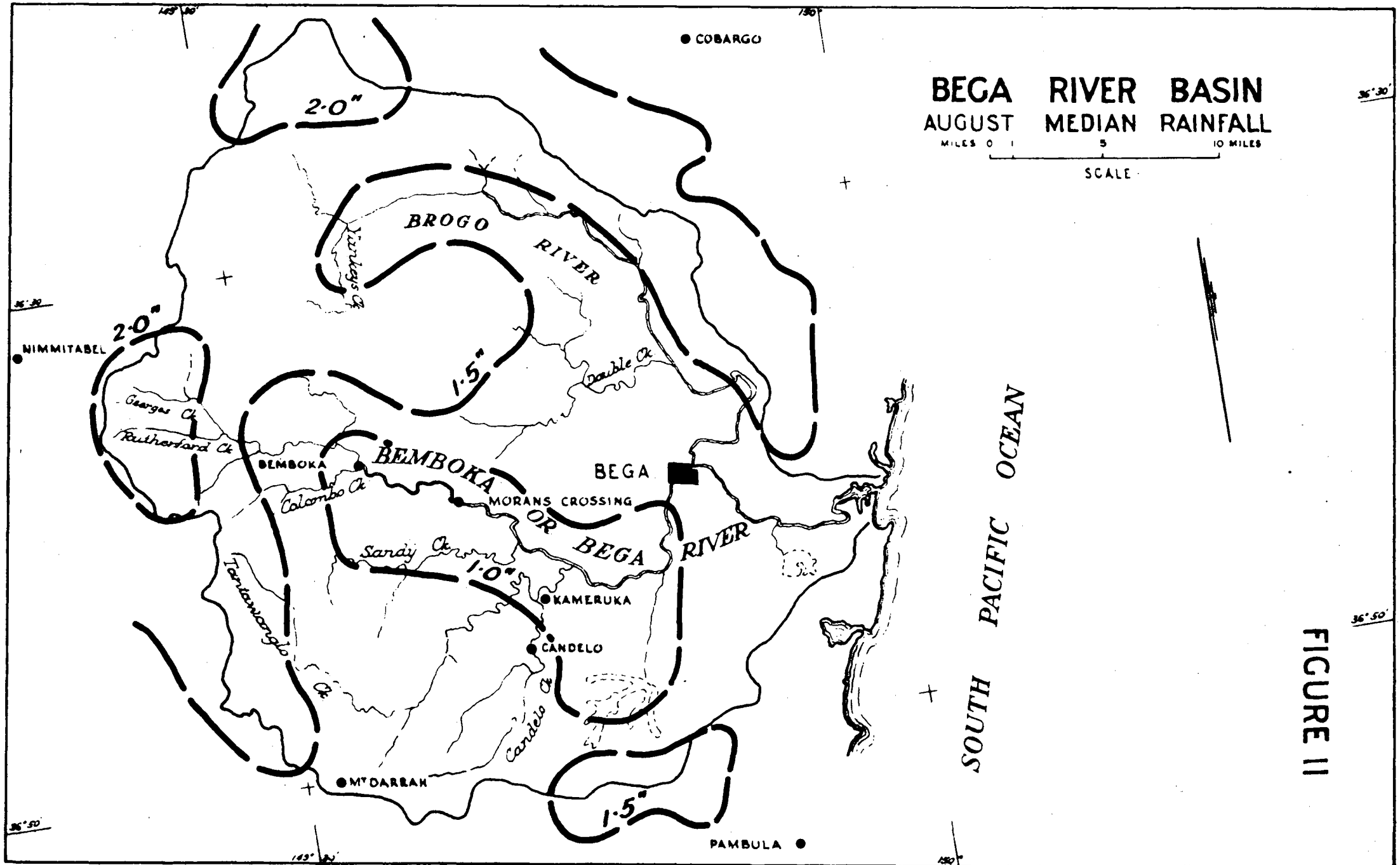


FIGURE II

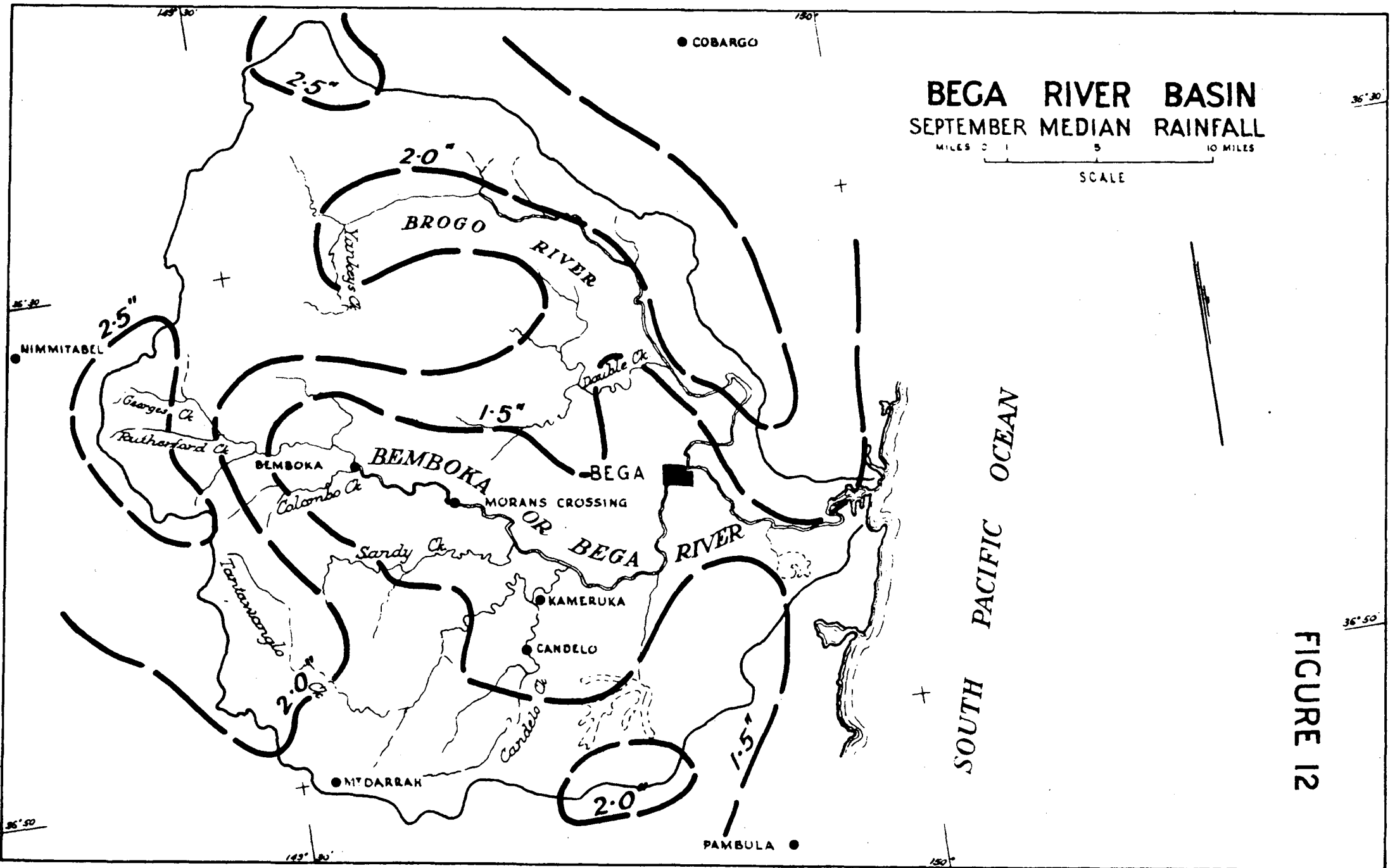


FIGURE 12

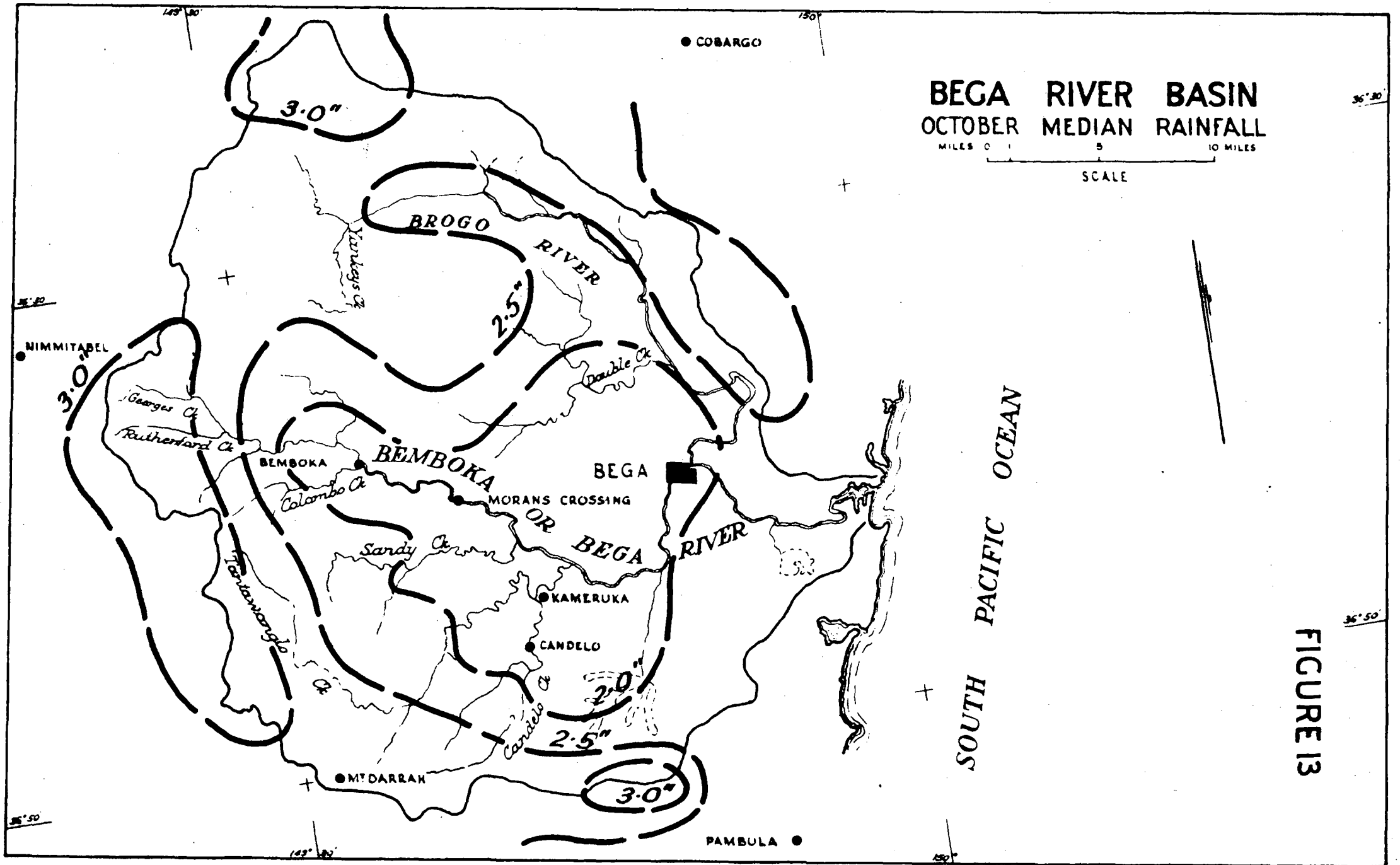


FIGURE 13



# BEGA RIVER BASIN NOVEMBER MEDIAN RAINFALL

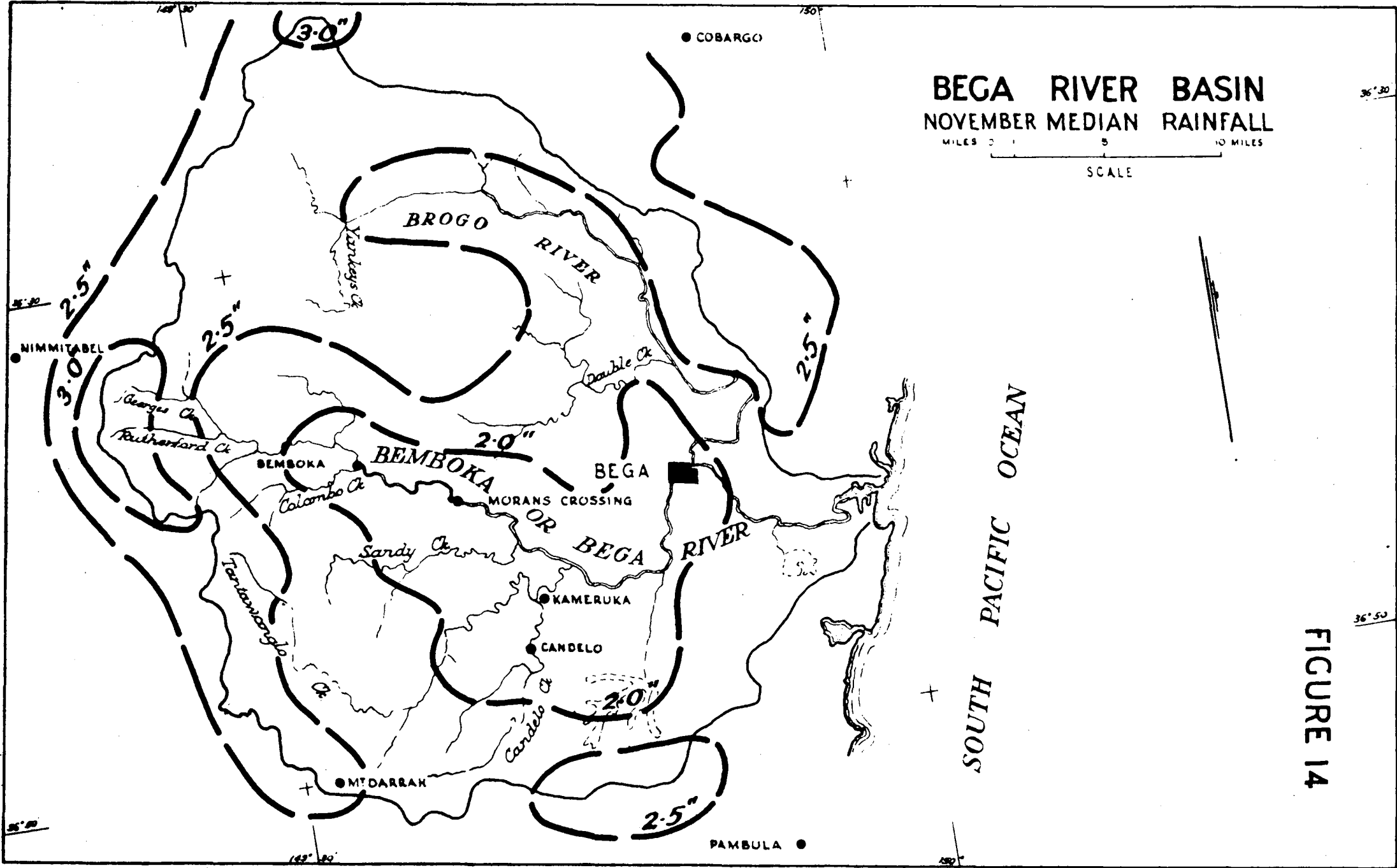
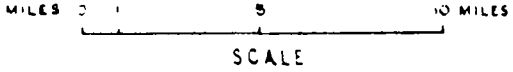


FIGURE 14

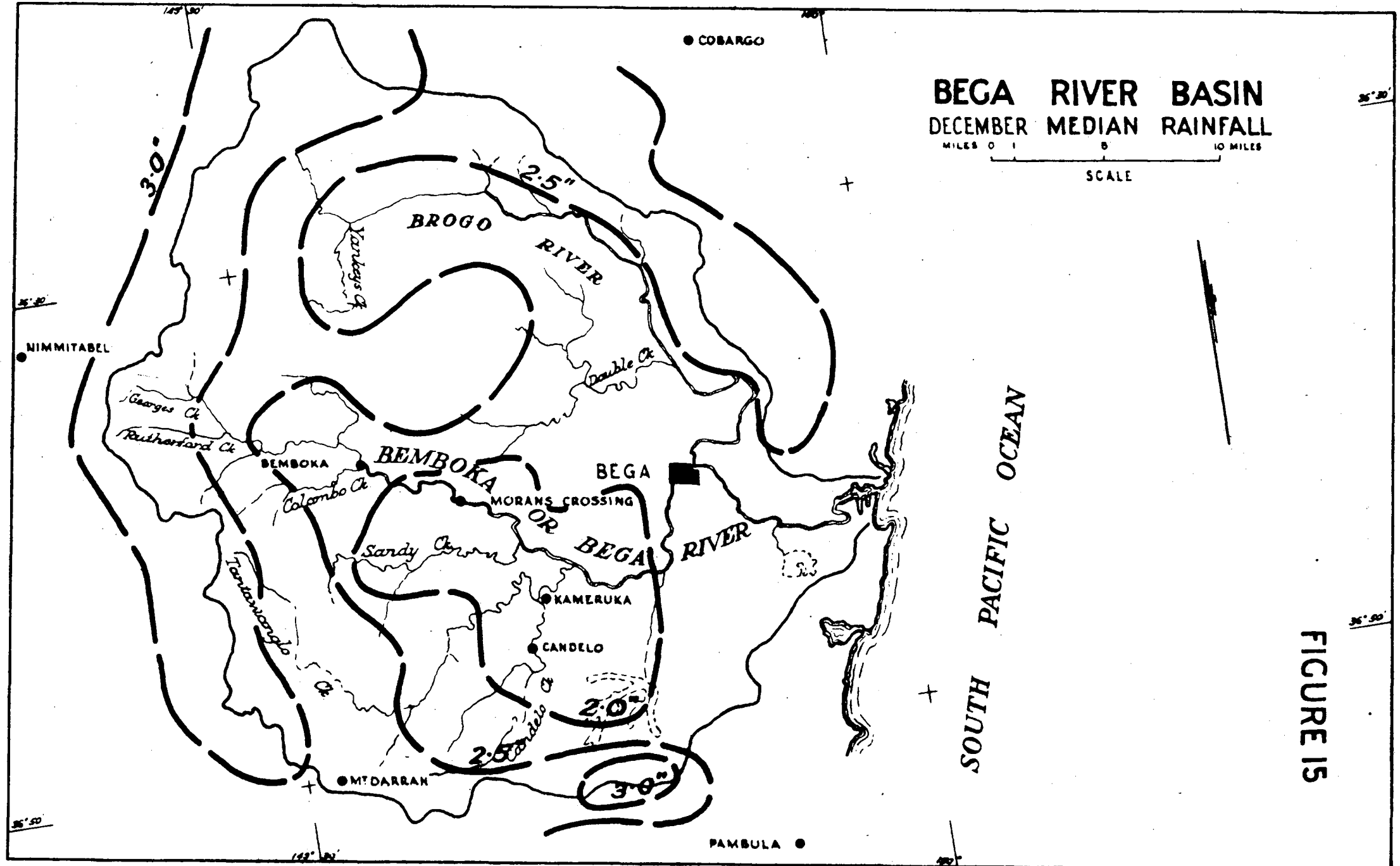
# BEGA RIVER BASIN DECEMBER MEDIAN RAINFALL

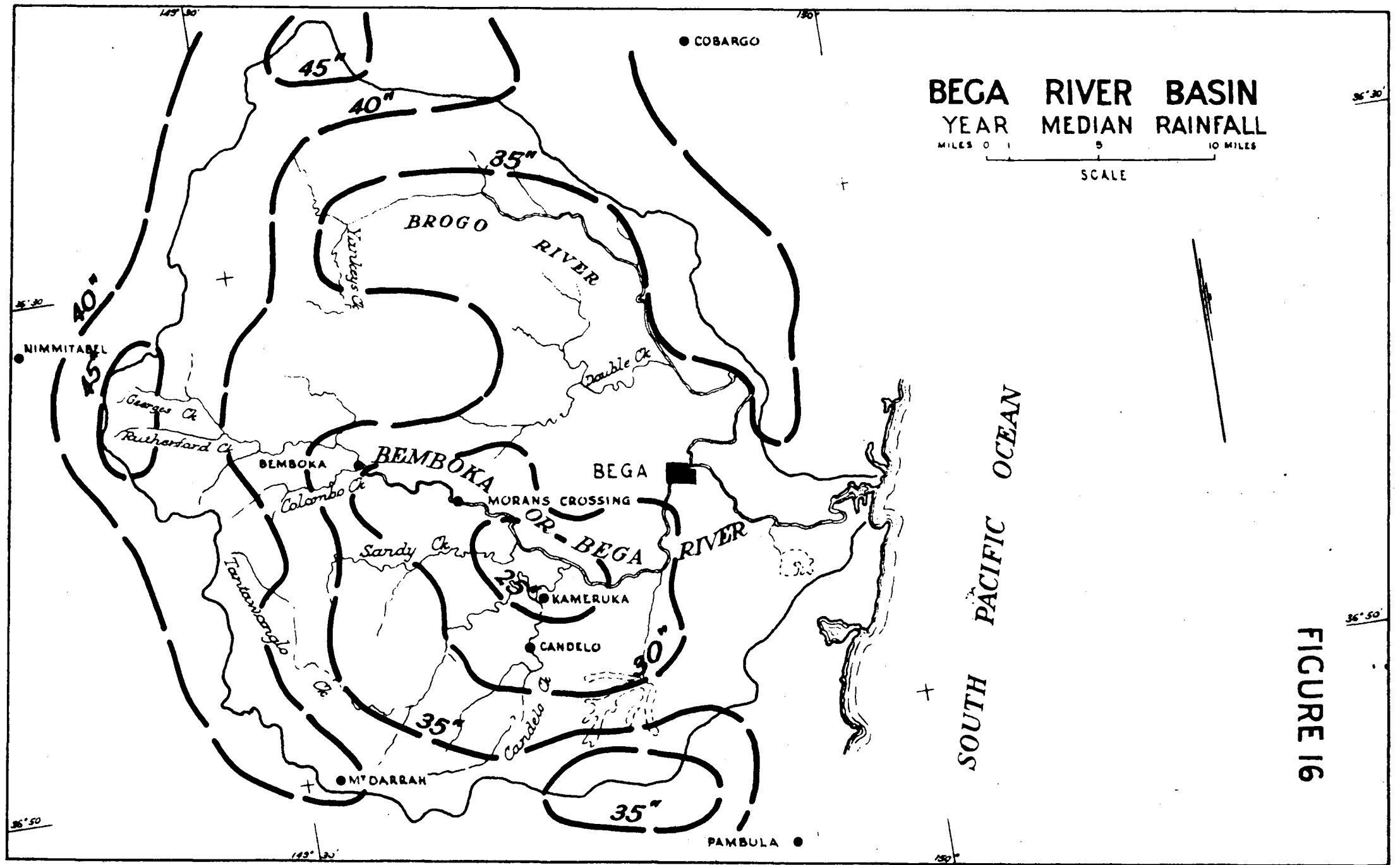
MILES 0 1 5 10 MILES

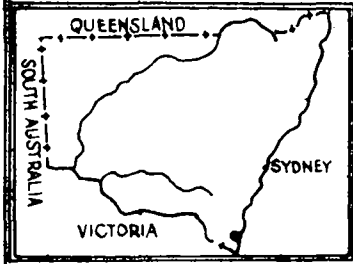
SCALE

SOUTH PACIFIC OCEAN

FIGURE 15





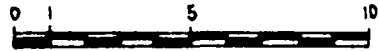
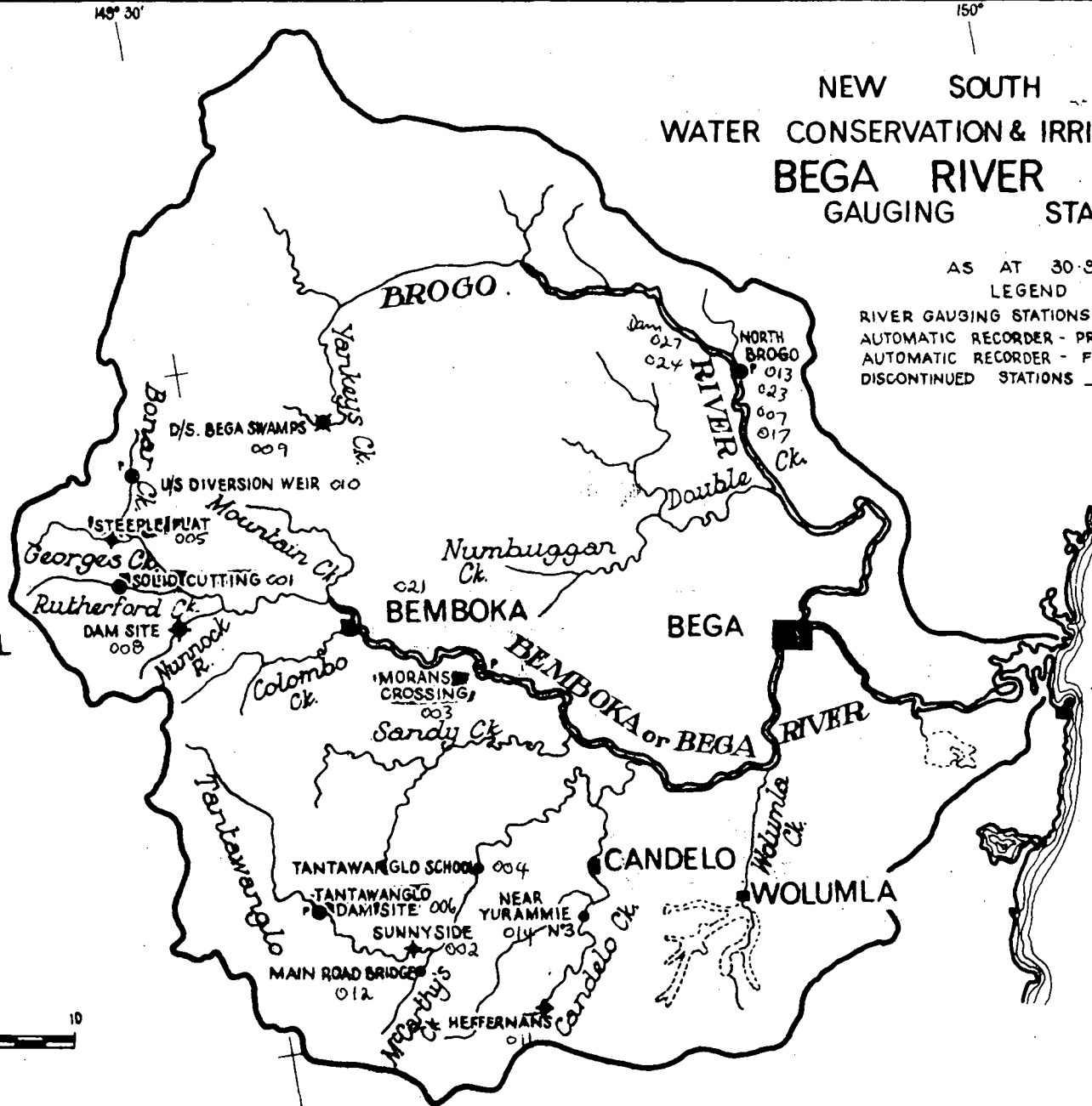


NEW SOUTH WALES  
 WATER CONSERVATION & IRRIGATION COMMISSION  
**BEGA RIVER BASIN**  
 GAUGING STATIONS

AS AT 30.9.65

LEGEND

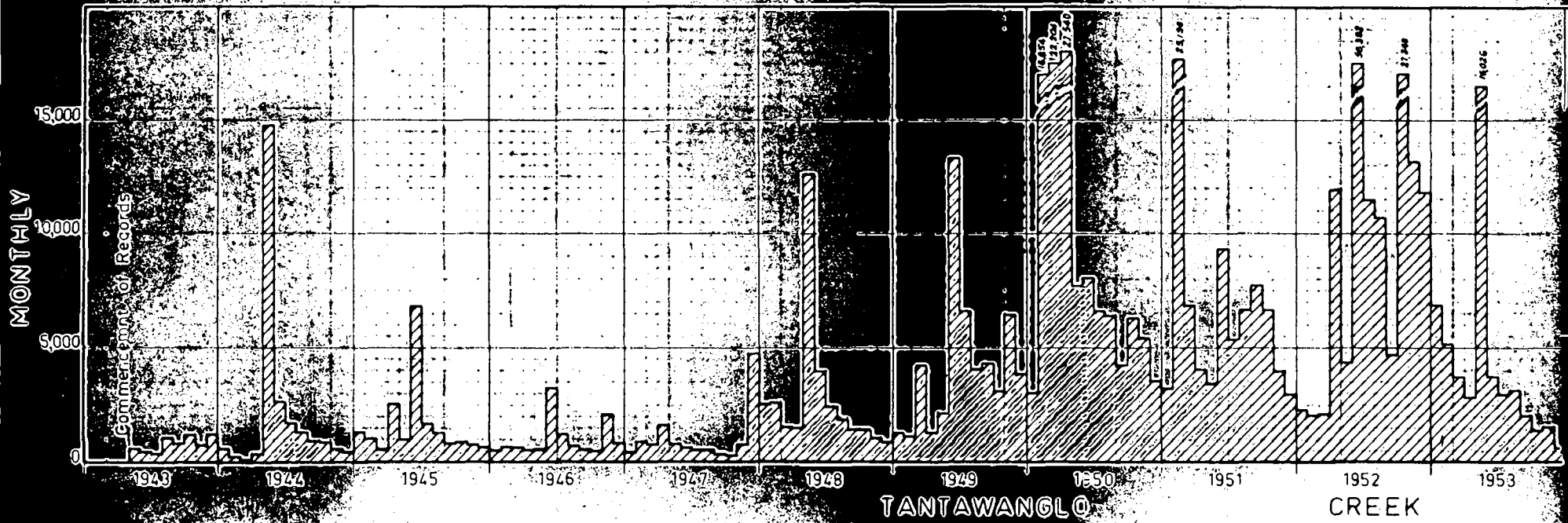
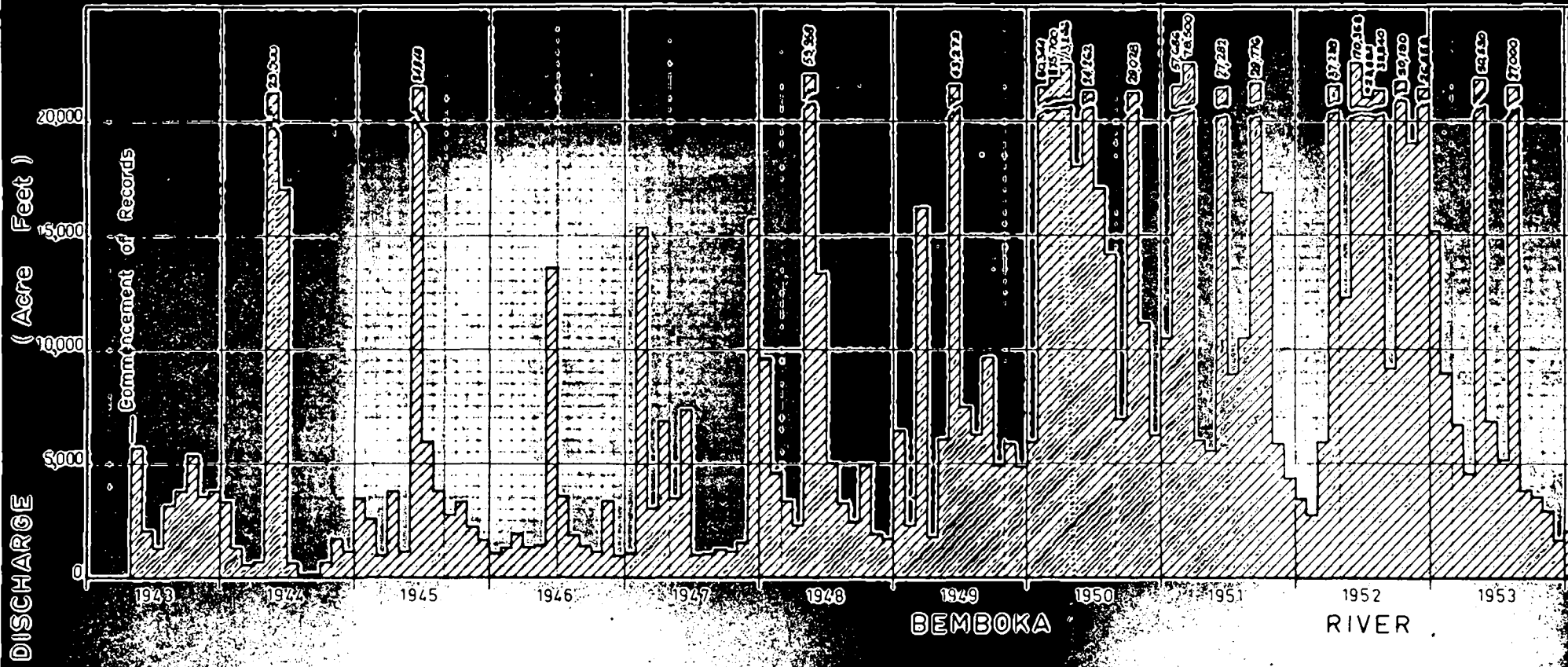
- RIVER GAUGING STATIONS - STAFF GAUGES
- AUTOMATIC RECORDER - PRESSURE TYPE
- AUTOMATIC RECORDER - FLOAT TYPE
- DISCONTINUED STATIONS



SCALE IN MILES

SOUTH PACIFIC OCEAN

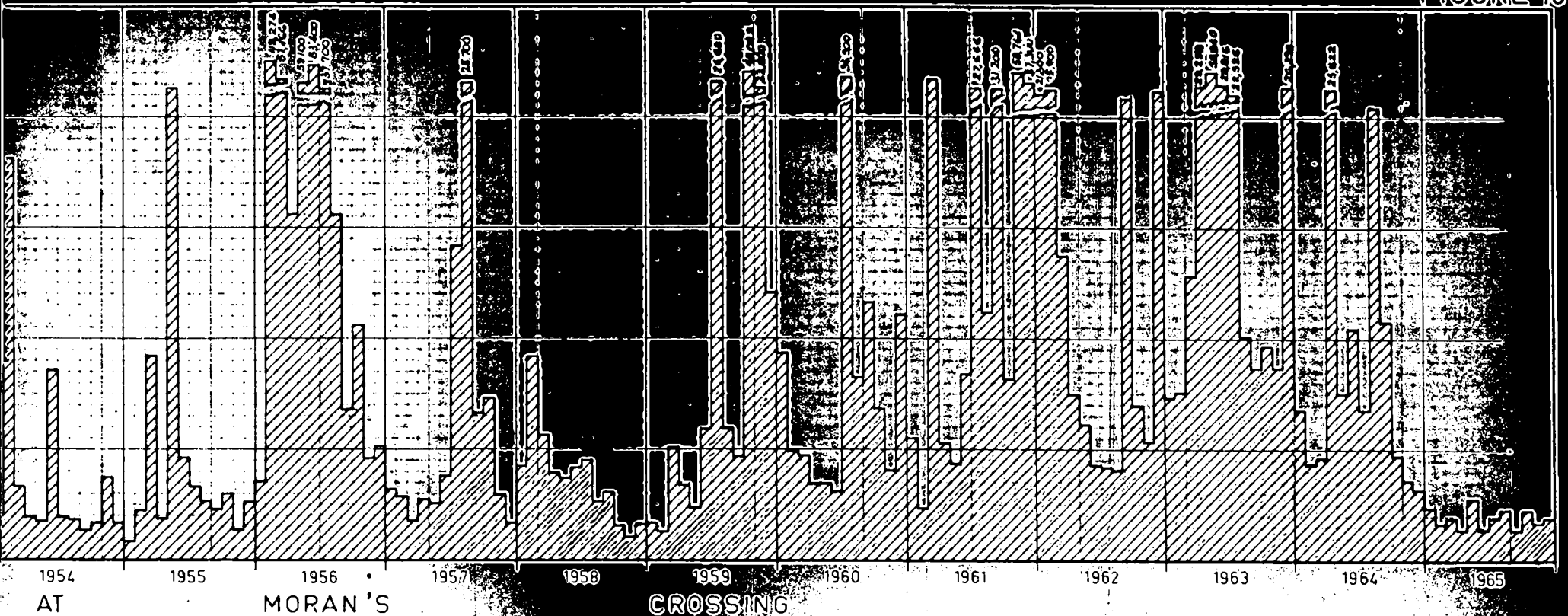
FIGURE 17



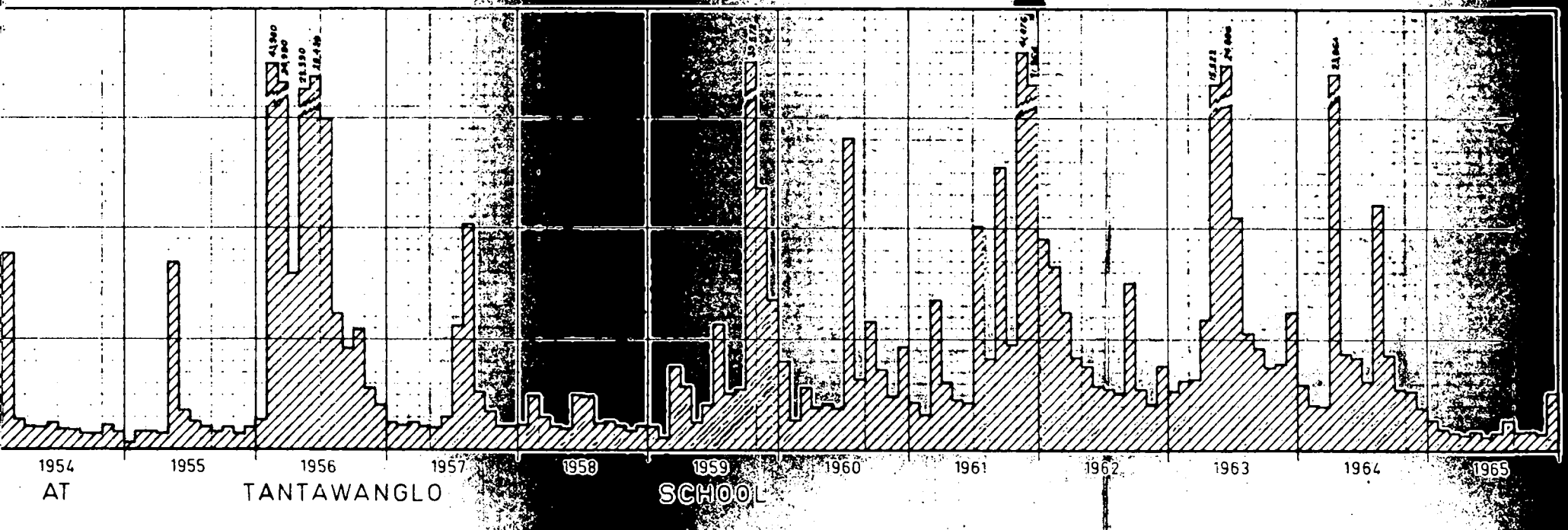
HYDROGRAPHS OF MONTHLY DISCHARGE  
FOR  
BEGA RIVER TRIBUTARIES

MONTHLY DISCHARGE  
(Acre Feet)

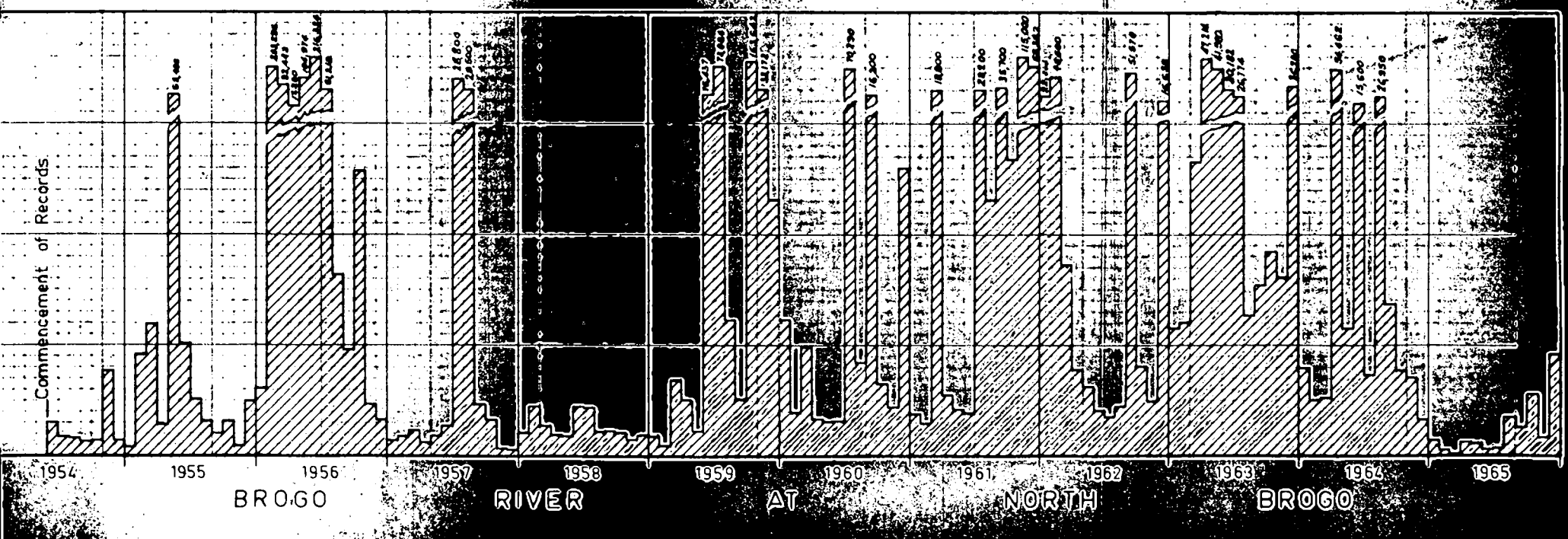
15,000  
10,000  
5,000



(Acre Feet)

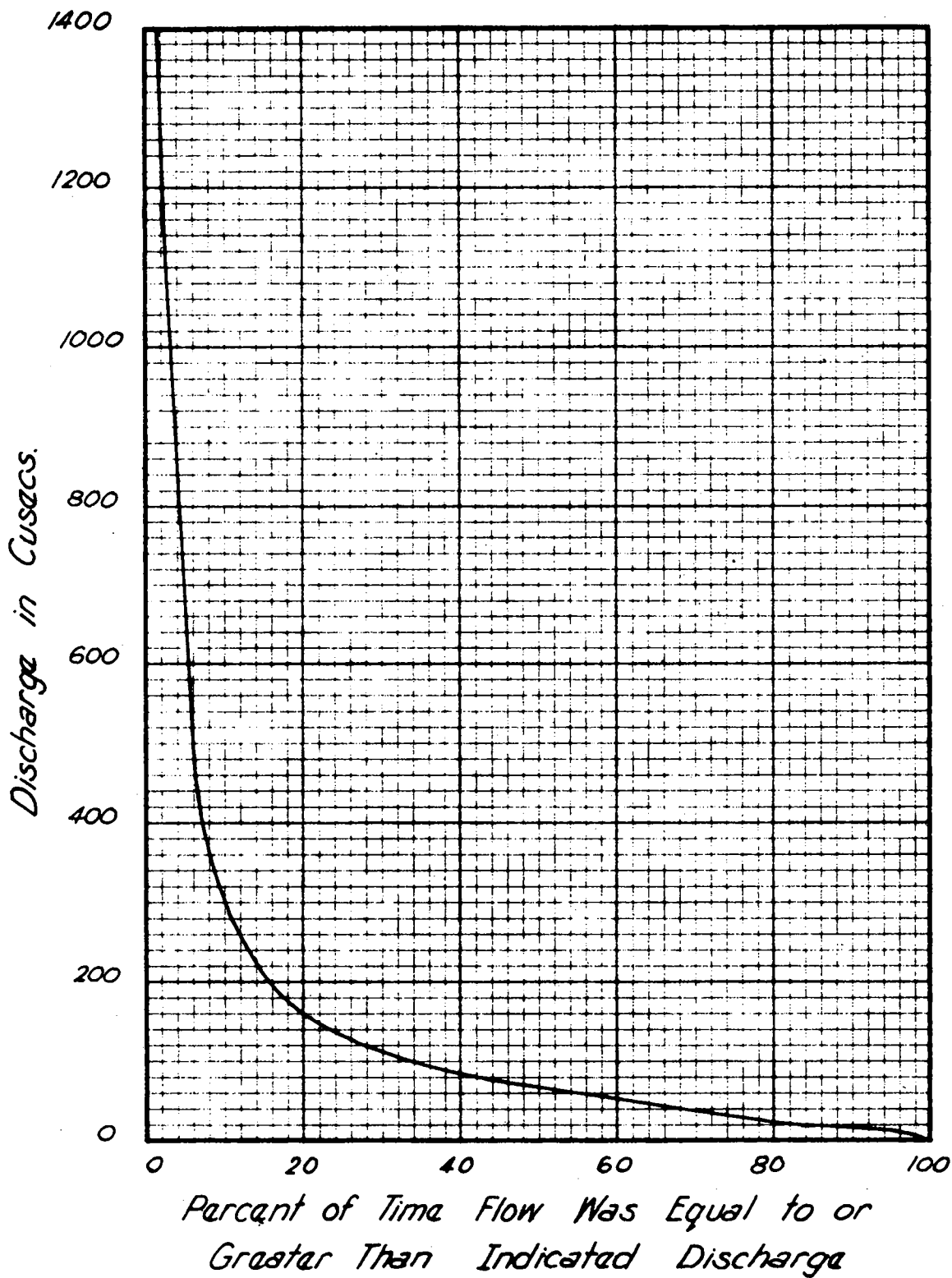


DISCHARGE

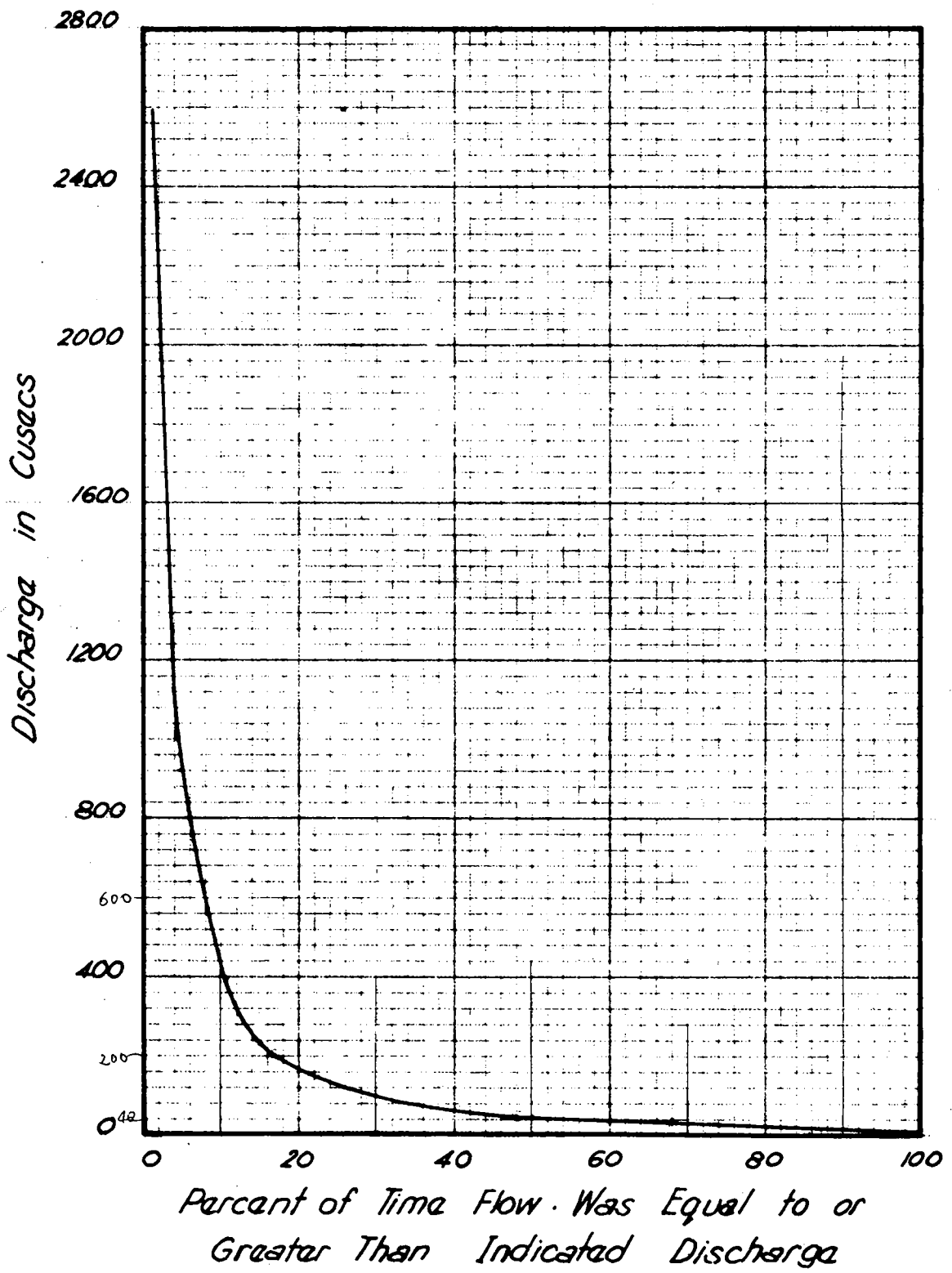


MONTHLY

Commencement of Records

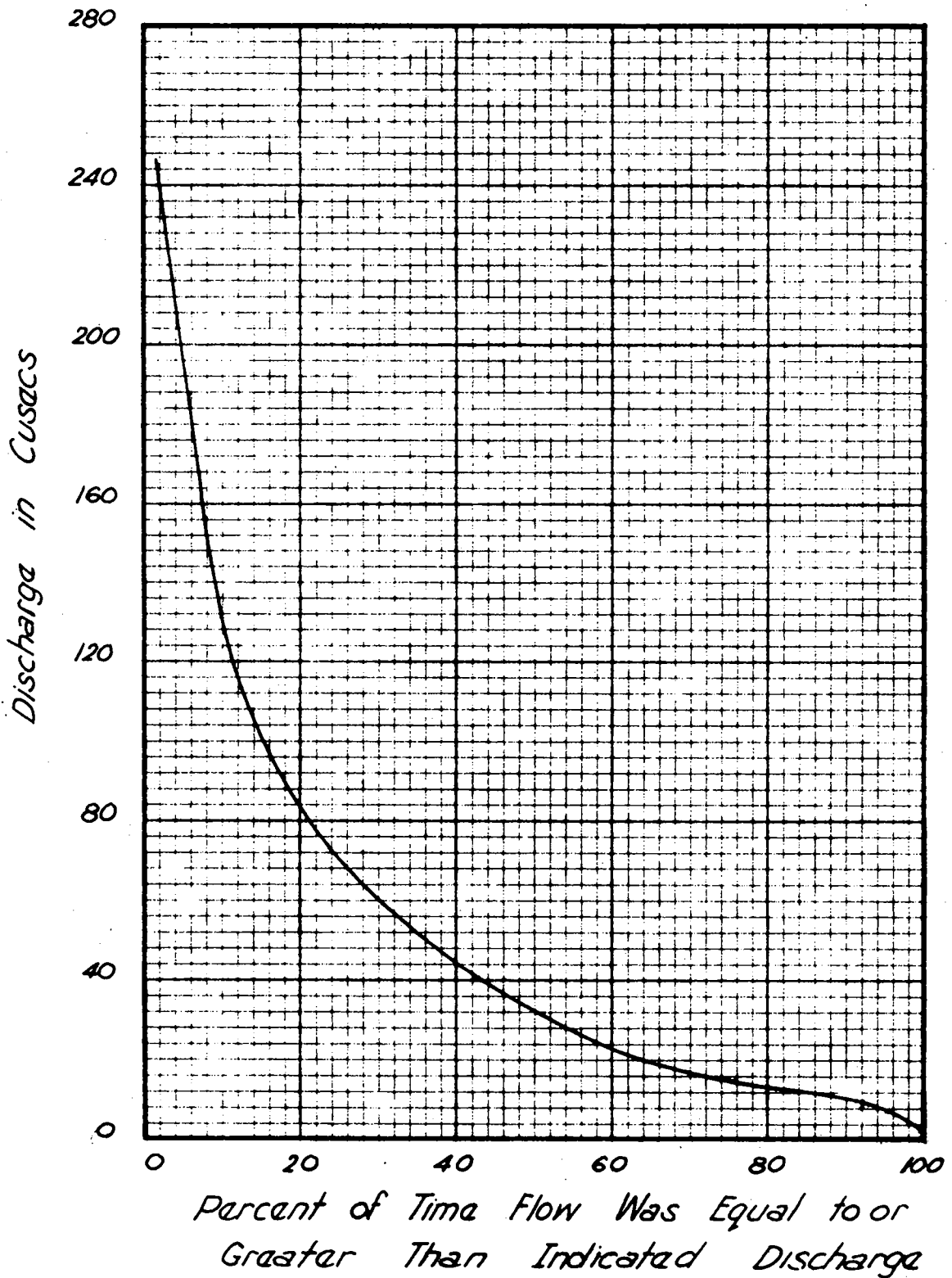


**FLOW DURATION CURVE  
FOR BEMBOKA RIVER  
AT MORANS CROSSING**



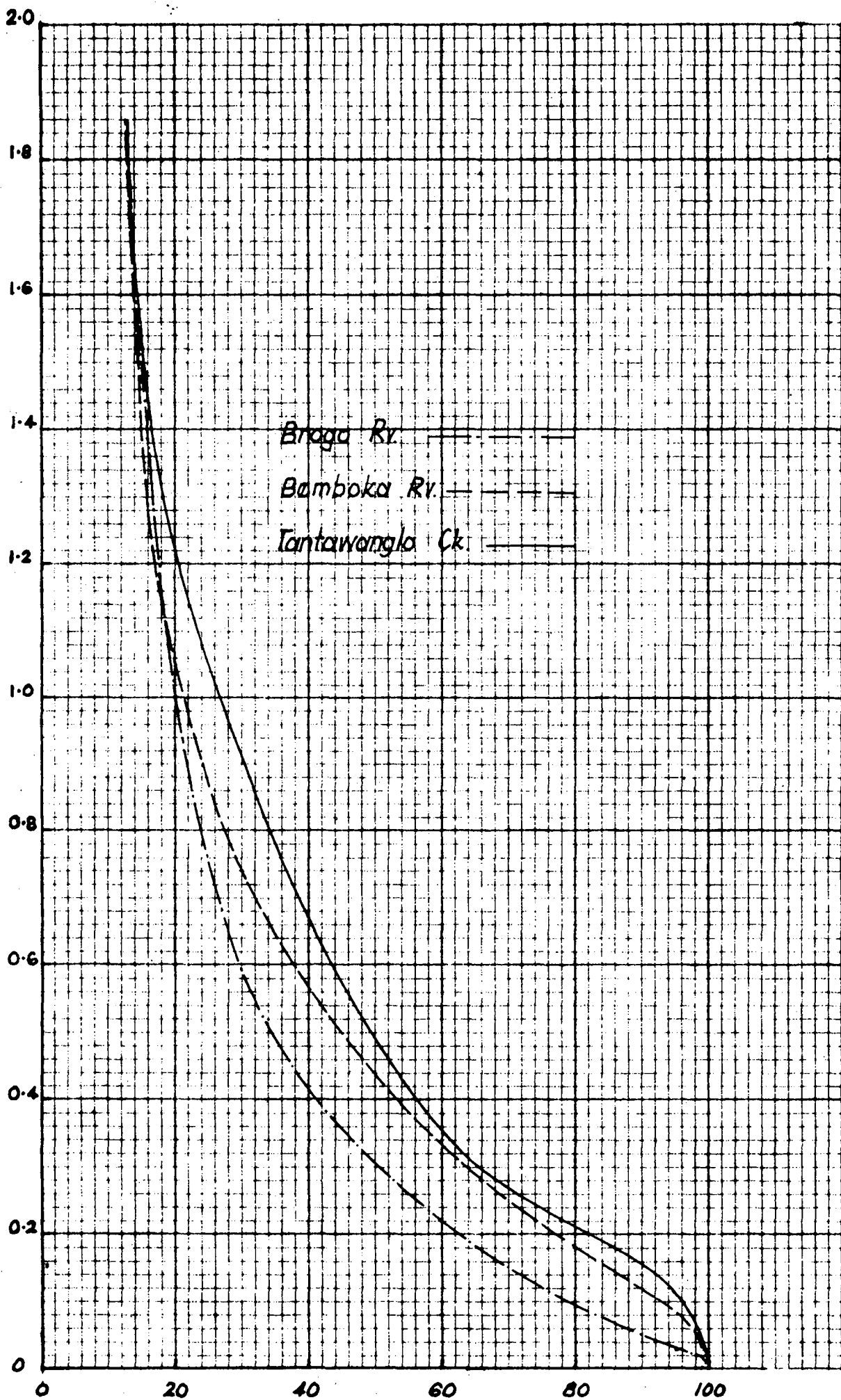
**FLOW DURATION CURVE  
FOR BROGO RIVER  
AT NORTH BROGO**





**FLOW DURATION CURVE FOR  
TANTAWANGALO CREEK AT  
TANTAWANGALO SCHOOL**

DISCHARGE - Cusecs per square mile of catchment.

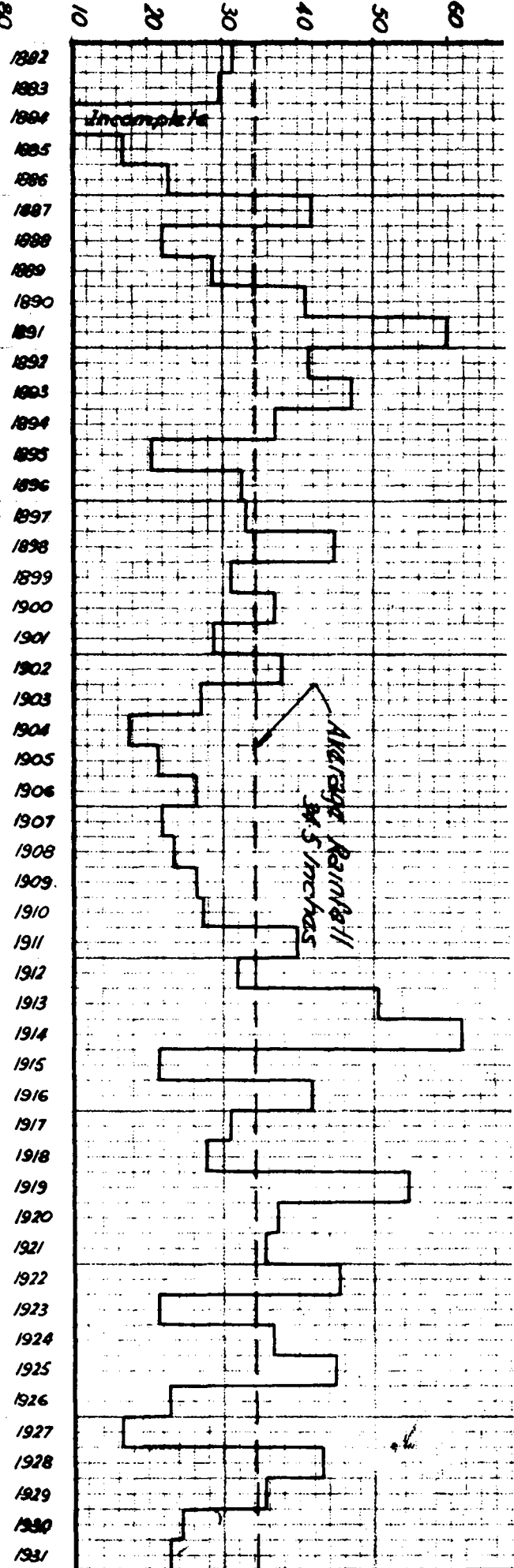
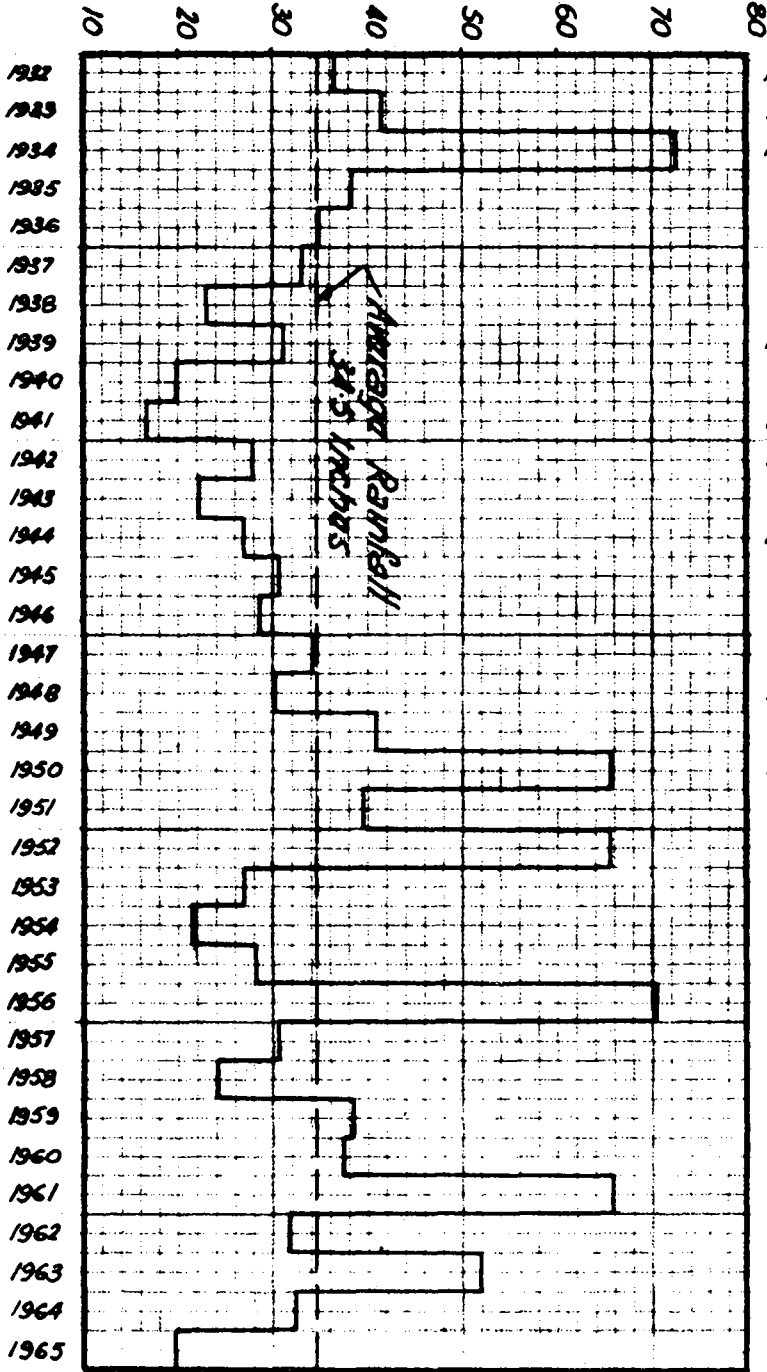


Percent of time flow was equal to or greater than indicated Discharge.

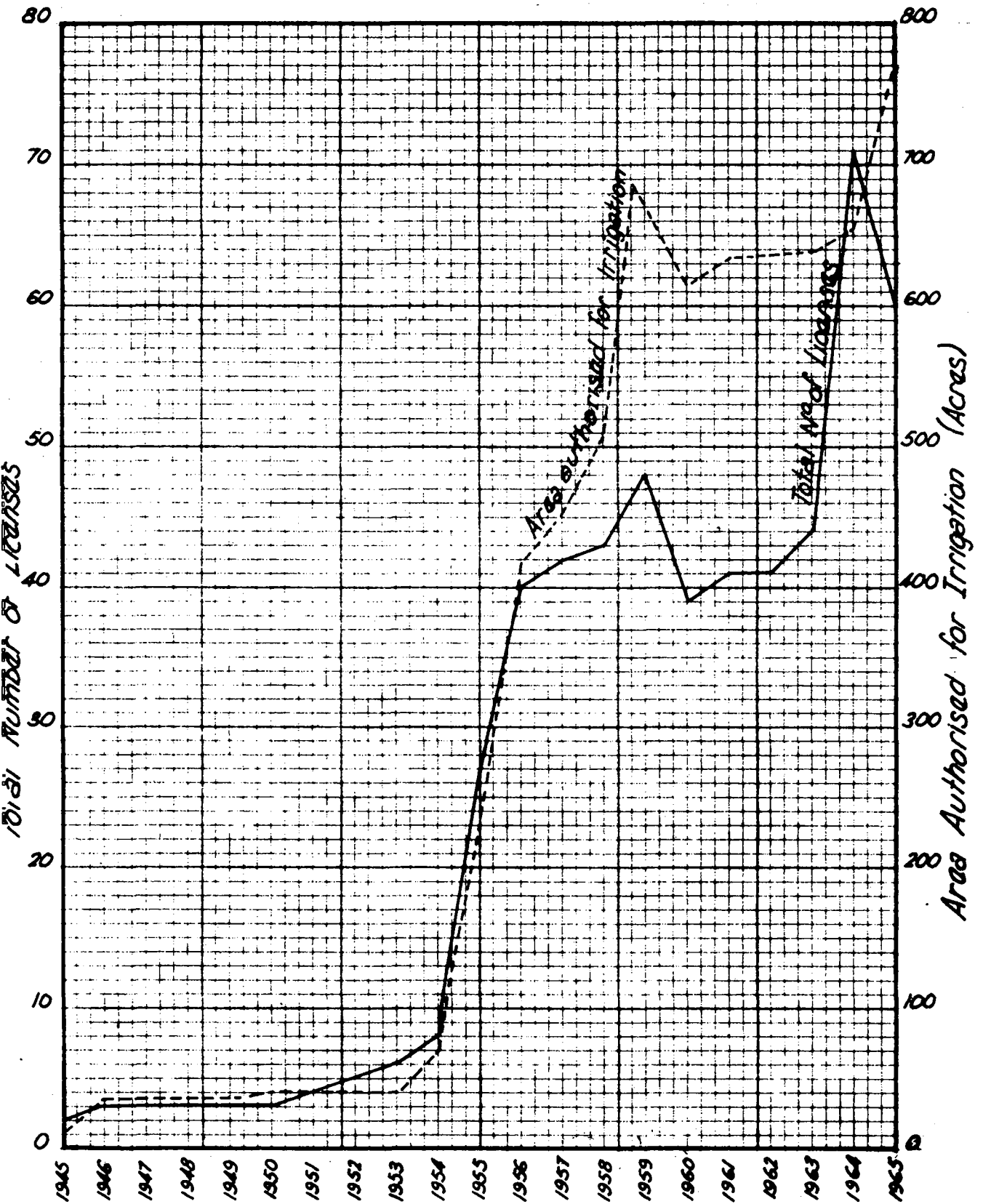
**FLOW DURATION CURVES  
FOR  
BEGA RIVER TRIBUTARIES**

Annual Rainfall (Inches)

Annual Rainfall (Inches)



DISTRIBUTION OF ANNUAL RAINFALL AT BEGA PERIOD 1892 to 1964



AREA AUTHORISED FOR IRRIGATION  
 AND TOTAL NUMBER OF LICENSES  
 CURRENT AT 30TH JUNE EACH YEAR  
 IN THE BEGA VALLEY