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UNITED STATES DEPARTMENT OF THE INTERIOR
RAY LYMAN WILBUR, Secretary

GEOLOGICAL SURVEY
W. C. MENDENHALL, Director

Water-Supply Paper 725

SURFACE WATER SUPPLY *of* HAWAII

JULY 1, 1930, *to* JUNE 30, 1931

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Prepared in cooperation with the
TERRITORY OF HAWAII

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SURFACE WATER SUPPLY OF HAWAII, JULY 1, 1930, TO JUNE 30, 1931

AUTHORITY FOR INVESTIGATIONS

This volume contains results of measurements of flow made on certain streams and ditches in the Territory of Hawaii during the year ending June 30, 1931. The data presented in this report were collected by the United States Geological Survey in cooperation with the Territory of Hawaii, under the general sanction of the organic law of the Geological Survey (20 Stat. L., p. 394), which contains the following paragraph:

> *Provided*, That this officer [the director] shall have the direction of the Geological Survey and the classification of public lands and examination of the geological structure, mineral resources, and products of the national domain.

As water is the most abundant and most valuable of the minerals, the investigation of water resources is authorized under the provision for examining mineral resources. Since the fiscal year ending June 30, 1895, successive appropriation bills passed by Congress have carried the following item:

> For gaging the streams and determining the water supply of the United States, and for the investigation of underground currents and artesian wells, and for the preparation of reports upon the best methods of utilizing the water resources.

For the fiscal years ending June 30, 1929, and thereafter the appropriation bills have carried, in addition to the above provisions, the following proviso: "*Provided*, That no part of this appropriation shall be expended in cooperation with States or municipalities except upon the basis of the State or municipality bearing all the expense incident thereto in excess of such an amount as is necessary for the Geological Survey to perform its share of general water resources investigations, such share of the Geological Survey in no case exceeding 50 per centum."

The Legislature of the Territory of Hawaii approved on March 22, 1909, "An act to promote the conservation and development of the natural resources of the Territory," which provided in substance as follows: A special tax of 2 per cent shall be levied, assessed, and collected annually on all incomes in excess of $4,000; and all amounts so collected shall constitute a special fund to be expended only for the encouragement of immigration and the conservation of natural

resources in the proportion of three-fourths for immigration and one-fourth for conservation. The conservation fund shall be used for the development, conservation, improvement, and utilization of the natural resources and shall be available for expenditure at such times and in such manner as a board of three persons appointed in accordance with section 80 of the organic act shall, with the approval of the governor, determine.

An act of April 26, 1911, amended the original act so as to extend it until December 31, 1913.

On April 4, 1913, the Governor of the Territory of Hawaii approved Act 56, for the creation and maintenance of a division of hydrography under the board of agriculture and forestry, and Act 57, appropriating the revenues from water licenses for the use of the board of commissioners of agriculture and forestry toward forest protection and hydrographic surveying.

Since June 30, 1915, the funds for the use of the division of hydrography have been supplied by successive appropriations from the general revenues of the Territory.

On March 23, 1917, an act (Act 27) by the Legislature of the Territory of Hawaii was approved transferring the control of the division of hydrography from the board of commissioners of agriculture and forestry to the commissioner of public lands.

COOPERATION

COOPERATION WITH THE TERRITORY OF HAWAII

Under the authority conferred by the Federal and Territorial legislation, the Director of the United States Geological Survey and the Governor of the Territory of Hawaii entered into a cooperative agreement, dating from July 1, 1910, for "the gaging of streams and the determination of the water supply of the Territory of Hawaii." [1]

The principal features of this agreement were:

1. The United States Geological Survey assumed the responsibility of gathering, analyzing, and publishing the data.

2. During the progress of the work all notes, maps, and data gathered as a result of field studies were at all times open to inspection by the representative of the Territory, and if they were not satisfactory the agreement could be terminated.

3. Accounts for payment of salaries, travel, and subsistence, supplies, or other expenses necessary to the completion of the work should be rendered in the manner required by the laws and regulations of the contracting parties, and vouchers should be proffered to either party for payment according as it might be convenient or according to the balance remaining in the respective allotments.

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[1] The United States Geological Survey also cooperated with the Territory of Hawaii in mapping the eight main islands.

4. The cost of publication was borne entirely by the Geological Survey.

In July, 1930, a new cooperative agreement for "the investigation of the water resources of the Territory of Hawaii during the fiscal year July 1, 1930, to June 30, 1931" was entered into, in which the amounts of money to be contributed by each party were specifically stated, these amounts to include the cost of publication; and which provided that "expenses incurred in the performance of the work herein provided shall, so far as may be practicable, be paid in the first instance by the party of the first part with appropriate reimbursement thereafter by the party of the second part, all accounts to be rendered in conformity with the laws and regulations of the party of the second part."

The provisions regarding responsibility for and supervision of the collection of the data, availability of records, etc., however, remained essentially the same.

A similar cooperative agreement was made for the fiscal year 1931–32, differing from that of 1930–31 chiefly in the amounts of money to be spent.

Unless otherwise stated, all data in this paper have been collected and are published under these later cooperative agreements with the Territory of Hawaii.

Until June 30, 1913, the Territory of Hawaii was represented in the cooperation by the board of conservation; from July 1, 1913, to March 23, 1917, by the board of commissioners of agriculture and forestry; and since this date by the commissioner of public lands.

OTHER COOPERATION

Some of the data in this paper have been obtained in cooperation with the City and County of Honolulu, the city of Hilo, and private persons and corporations, under one of the plans indicated in the following paragraphs:

1. Expense of work, equipment, and installation paid entirely or in part by the cooperating party.
2. Records collected by employees of a cooperating party but under supervision of and by methods of the Survey.
3. Assistance given in the collection of records, such as furnishing transportation, subsistence, and equipment.
4. Records furnished by a cooperating party, collected by his methods and under his supervision.

Cooperation in the collection of records for whose accuracy responsibility has not rested with the Geological Survey has been acknowledged in the descriptions of the stations. Special acknowledgment is due to the following organizations cooperating under plans 1, 2, and 3: Island of Kauai—Kekaha Sugar Co., McBryde Sugar Co., Gay

& Robinson, East Kauai Water Co., B. P. Bishop Estate, and American Factors (Ltd.); Island of Oahu—City and County of Honolulu, Board of Water Supply, B. P. Bishop Estate, and Wahiawa Water Co.; Island of Maui—Pioneer Mill Co. and East Maui Irrigation Co.; Island of Hawaii—Hilo Waterworks, and Kohala Ditch Co.

SCOPE OF WORK

Since the beginning of stream-gaging work in Hawaii in 1910, records of flow of streams and ditches have been obtained at about 425 stations for periods ranging from a few months to 22 years. In addition hundreds of miscellaneous measurements have been made, and rather extensive studies of ground water have been made in Kau, Hawaii, and in Honolulu, Oahu.

In this volume are given the records of daily flow that were obtained at the 83 stations that were operated during the year ending June 30, 1931, and the results of miscellaneous measurements of stream flow made during that year. The results of ground-water studies will be published in separate water-supply papers. (See p. 7 for a record of other water-supply papers pertaining to Hawaii.)

DEFINITION OF TERMS

The volume of water flowing in a stream—the "run-off" or "discharge"—is expressed in various terms, each of which has become associated more or less definitely with a certain class of work. These terms may be divided into two groups: (1) Those that represent a rate of flow, as "second-feet," "gallons a minute," "gallons a day," "miner's inches," and "run-off in second-feet a square mile," and (2) those that represent the actual quantity of water, as "run-off in inches," "million gallons," and "acre-feet." Those used in this report may be defined as follows:

"Second-foot" is an abbreviation for cubic foot a second and is the unit for the rate of discharge of water flowing in a stream 1 square foot in cross section at a rate of 1 foot a second. It is generally adopted as the fundamental unit in the measurement of flowing water and is the "natural" unit, as the foot and the second are the units used in making the physical determinations.

An "acre-foot" is equivalent to 43,560 cubic feet and is the quantity required to cover an acre to the depth of 1 foot. The term is commonly used in connection with storage for irrigation.

In the Territory of Hawaii the unit most commonly used in measuring water is the "million gallons." This is used with two meanings—(1) to indicate a rate of flow and (2) to express an actual quantity of water. In the former sense "million gallons a day" is inferred, 1,000,000 gallons being taken as the unit of quantity and 24 hours as the unit of time. With this meaning the term is gen-

erally used in connection with pumping and irrigation. In the latter sense "million gallons" as an absolute quantity is used in the measurement of storage capacities of reservoirs.

The following convenient approximate relations exist between second-feet, million gallons a day, and acre-feet; 1 second-foot flowing 24 hours equals about 2 acre-feet; 1,000,000 gallons equals about 3 acre-feet; and 1 second-foot equals approximately two-thirds of 1,000,000 gallons a day.

The following terms not in common use are here defined:

"Stage-discharge relation," an abbreviation for the term "relation of gage height to discharge."

"Control," a term used to designate the natural section or stretch of the channel or artificial structure below the gage which determines the stage-discharge relation at the gage.

The "point of zero flow" for a gaging station is that point on the gage—the gage height—at which water ceases to flow over the control.

EXPLANATION OF DATA

The base data collected at gaging stations consist of records of stage, measurements of discharge, and general information used to supplement the gage heights and discharge measurements in determining the daily discharge. The records of stage used in computing discharges in this paper are obtained from water-stage recorders that give continuous records of the fluctuations. Measurements of discharge are made with a current meter by the general methods outlined in standard textbooks on the measurement of river discharge. Occasionally discharge is determined from a weir or a rating flume, using standard formulas. Rating tables giving the discharge for any stage are prepared from the discharge measurements. The application of the daily gage heights to these rating tables gives the discharge from which the daily, monthly, and yearly discharges are determined.

The data presented in this report comprise, for each gaging station, a description of the station, a table showing the daily discharge of the stream, and a table of monthly and yearly discharge and run-off. All rates of flow are expressed as million gallons a day.

The description of the station gives location, drainage area, records available, discharge corresponding to maximum and minimum recorded stages, and, under "Remarks," notes on accuracy of the records, diversions that decrease the flow at the gage, and artificial regulation.

The table of daily discharge gives, in general, the discharge corresponding to the mean daily gage heights. At stations on streams subject to sudden or rapid diurnal fluctuation the discharge obtained from the rating table by applying the mean daily gage height may not be the true mean discharge for the day. At such stations the mean

daily discharge may be obtained by averaging discharges for intervals during the day.

In the table of monthly discharge the column headed "Maximum" gives the flow for the day when the total discharge was greatest. This does not correspond to the rate of flow at the crest of the flood. The maximum rate of flow is given in the station description under the heading "Extremes," and the corresponding stage is always taken from the water-stage recorder graph unless otherwise noted. Likewise, in the column headed "Minimum" the quantity given is the flow for the day when the total discharge was least. The columns headed "Mean" give the average flow in million gallons a day and cubic feet a second during the month. The "total in million gallons" is the sum of the daily flows, and the "total in acre-feet" is computed from the mean monthly discharge in million gallons a day.

ACCURACY OF FIELD DATA AND COMPUTED RESULTS

The accuracy of stream-flow data depends primarily (1) on the permanence of the stage-discharge relation, and (2) on the accuracy of observation of stage, measurements of flow, and interpretation of records.

Permanence of the stage-discharge relation will be affected by any change in the control due to growth of vegetation in the stream bed, effects of floods, or any artificial changes, and it may be affected by changes in gage datum.

Observations of stage are taken from the water-stage recorder graphs, with a scale of gage heights so chosen as to give less than 2 per cent of error. However, this accuracy may be interfered with by unsatisfactory operation of water-stage recorders or by plugged or sluggish intakes to stilling wells.

In general, measurements of flow by current meter give less than 5 per cent of error except where it is impossible to find suitable measuring conditions. Rating curves are usually well defined, except for extremely low or high stages, by current-meter measurements and are extended by the use of area and velocity curves, slope measurements, weir tables, logarithmic curves, comparison with previous curves, knowledge of the station, or any combination of these methods.

Unless otherwise noted daily discharges are ascertained by applying to the rating table mean daily gage heights obtained from the recorder graph by inspection or, for days of considerable fluctuation in stage, by averaging discharges for intervals of the day. All computations are carried to not more than three significant figures. The discharges thus obtained are plotted, usually on semi-logarithmic paper, for comparison with the flow of comparable streams, and any inconsistencies that appear are verified or corrected.

A general statement under "Remarks" gives the accuracy of records, based on the above information, the terms "excellent," "good," "fair," or "poor," indicating that the record is probably accurate within 5, 10, 15, and 20 per cent, respectively.

It should be borne in mind that the observations in each succeeding year may be expected to throw new light on data previously published.

DIVISION OF WORK

The data were collected and prepared for publication under the direction of M. H. Carson, district engineer, Honolulu, Hawaii, by W. E. Armstrong, office engineer, K. N. Valsvik, K. M. Kelley, Sam Wong, G. E. Ferguson, H. W. Palm, G. T. Hirashima, Kenichi Kawamura, John Kaheaku, P. T. P. Goo, and Miss M. A. Davidson. The manuscript has been prepared by W. E. Armstrong and Sam Wong and reviewed by M. H. Carson.

PUBLICATIONS

The following table gives by years the numbers of the papers on the surface-water supply of Hawaii containing data from 1903 to 1931, and used in conjunction with the list of stations maintained (see Water-Supply Paper 595) provides a convenient index for finding the data for any station. The data for any particular station will be found in the reports covering the years during which the station was maintained except when publication is delayed, owing to undeveloped rating curves. Occasionally data are revised and republished in later papers. Miscellaneous discharge measurements made during any year at points other than regular gaging stations are published in the paper containing that year's data.

Numbers of water-supply papers containing data on the surface-water supply of Hawaii, 1903–1931

Year	Number	Year	Number	Year	Number
1903	[a] 77	1917–18	485	1924–25	615
1909–1911 [b]	318	1918–19	515	1925–26	635
1912 [b]	336	1919–20	516	1926–27	655
1913 [b]	373	1920–21	535	1927–28	675
1913–1915	430	1921–22	555	1928–29	695
1915–16	445	1922–23	575	1929–30	710
1916–17	465	1923–24	595	1930–31	725

[a] Water resources of Molokai, by Waldemar Lindgren.
[b] Calendar years; reports subsequent to Water-Supply Paper 373 cover the year beginning July 1 and ending June 30.

GAGING-STATION RECORDS

ISLAND OF KAUAI

WAIMEA RIVER BELOW KEKAHA DITCH INTAKE, NEAR WAIMEA, KAUAI

LOCATION.—Water-stage recorder in Waimea Canyon, 500 feet below Kekaha Ditch intake and 8 miles by trail north of Waimea.

DRAINAGE AREA.—45.0 square miles.

RECORDS AVAILABLE.—July, 1921, to June, 1931.

EXTREMES.—Maximum discharge during year, 1,490 million gallons a day or 2,310 second-feet Nov. 18 (gage height, 14.0 feet); minimum, 0.06 million gallons a day or 0.9 second-foot May 24, 26–27, 31, June 6–8, 20–23.

1921–1931: Maximum discharge, 2,770 million gallons a day or 4,290 second-feet Dec. 24, 1927 (gage height, 20.40 feet); no flow several days from July to November, 1926, and from November to December, 1929.

REMARKS.—Records good for medium stages; poor for all extremely high and low stages. Kokee Ditch and Kekaha Ditch divert above the station, taking practically all the water at low and medium stages for irrigation near Waimea and Kekaha.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	70	221	112	75	5.6	3.0	26	0.4	0.4	35	0.5	0.1
2	190	10.5	133	7.0	8.6	146	25	.8	180	62	.7	.1
3	56	12.5	236	.6	.4	84	15	.5	124	39	.6	.1
4	3.7	2.2	114	.6	.4	13	17.5	.4	24	1.5	.4	.1
5	1.4	1.0	25	104	.4	1.5	19	.4	1.0	.4	.4	.2
6	1.1	7.8	6.0	117	.4	1.0	7.4	.4	.5	.4	.4	.1
7	.9	1.3	12	72	1.1	.6	32	.4	.4	.5	.4	.1
8	.9	.9	4.5	30	80	.4	.5	.4	.4	.6	.4	.1
9	.7	.9	.8	1.9	2.1	.4	.4	.3	.4	.4	.4	.1
10	.6	31	.8	6.0	.5	.4	.4	.3	.4	.4	.4	.1
11	.7	127	38	7.0	418	.4	.4	.3	.7	.4	.4	.1
12	.8	280	3.0	.7	325	.5	14.5	.3	.4	.4	.4	.1
13	8.0	24	.6	.6	144	.4	63	.3	.4	.4	.3	.1
14	.7	2.6	.5	.6	82	.4	24	.3	.3	.4	.2	.1
15	.5	2.4	2.5	.5	59	.5	1.4	.4	.3	.4	.4	.1
16	.5	1.0	1.1	.4	42	3.4	.4	.4	.2	.4	.3	.3
17	.5	1.8	6.3	.5	22	31	.4	.6	.2	.4	.2	47
18	.5	2.0	23	.8	297	43	.4	.4	.2	.5	.2	1.3
19	.6	24	2.4	.7	517	5.7	.4	.4	.3	19.5	.5	.1
20	3.8	17.5	12	.5	107	.4	.3	.5	.4	192	1.3	.1
21	.8	.8	15	.4	68	23	.3	.5	.3	4.6	.2	.1
22	2.4	1.1	5.2	.4	51	3.3	.3	13.5	.3	.4	.1	.1
23	.7	.6	35	.4	46	.4	.3	7.3	.3	.4	.1	.2
24	.6	.6	11	9.2	24	.6	.3	36	.3	.4	.1	.3
25	.6	.6	1.2	55	13	1.1	.4	62	.2	.4	.1	.2
26	.6	.6	.6	33	64	.6	.4	2.8	.3	.4	.1	1.5
27	.6	.6	.9	.5	46	5.5	.4	2.4	.4	.4	.1	.3
28	.6	.6	1.0	.4	15.5	30	.4	.4	.4	.4	.1	.2
29	.6	8.7	.5	.7	8.5	50	.4	-------	.4	.4	.1	.3
30	.6	.4	18.5	29	5.4	40	.3	-------	.9	.4	.1	.2
31	65	11	-------	1.6	-------	29	.3	-------	23	-------	.1	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	190	0.5	13.4	20.7	415	1,270
August	280	.4	25.7	39.8	797	2,440
September	236	.5	27.4	42.4	822	2,520
October	117	.4	18.0	27.9	557	1,710
November	517	.4	81.8	127	2,450	7,530
December	146	.4	16.8	26.0	520	1,600
January	63	.3	8.14	12.6	252	774
February	62	.3	4.75	7.35	133	408
March	180	.2	11.7	18.1	362	1,110
April	192	.4	12.1	18.7	363	1,110
May	1.3	.1	.32	.50	10.0	30
June	47	.1	1.79	2.77	53.8	165
The year	517	.1	18.5	28.6	6,730	20,700

KAWAIKOI STREAM NEAR WAIMEA, KAUAI

LOCATION.—Water-stage recorder 2 miles northeast of Kokee ranger station and 12½ miles northeast of Waimea.

DRAINAGE AREA.—4.1 square miles.

RECORDS AVAILABLE.—April, 1909, to June, 1931. July, 1917, to July, 1919, not published.

EXTREMES.—Maximum discharge during year, 1,210 million gallons a day or 1,870 second-feet Nov. 18 (gage height, 9.58 feet); minimum, 2.0 million gallons a day or 3.1 second-feet Oct. 22.

1909–1931: Maximum discharge, 1,670 million gallons a day or 2,580 second-feet Dec. 13, 1924 (gage height, 12.11 feet); minimum, 1.3 million gallons a day or 2.0 second-feet Sept. 15, 1921.

Highest known flood, 15.2 feet Dec. 18, 1916 (discharge not determined).

REMARKS.—Records good for ordinary stages. No diversions above station.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	118	65	15	44	4.3	8.6	6.8	10.5	7.7	8.3	10.5	3.7
2	67	15	21	8.2	3.5	174	6.3	7.6	89	50	11	3.6
3	18	19	30	8.3	3.0	44	5.9	5.8	63	15.0	8.1	3.5
4	15.5	7.7	12	10.8	2.6	18.5	5.8	5.1	16.5	7.4	9.9	3.3
5	20	7.6	5.8	19	2.8	14.5	5.8	4.6	19	5.4	9.2	3.2
6	14	5.0	4.2	17.5	4.2	12	5.9	4.4	9.6	6.9	7.1	3.0
7	18	4.6	3.8	11	47	19	5.6	4.2	6.9	9.7	14.5	3.0
8	13.5	3.6	5.1	5.6	55	23	5.6	4.2	6.1	11	12	2.9
9	7.4	3.1	4.0	5.5	9.2	12	5.6	11	16	5.4	15	2.9
10	6.8	50	3.3	5.0	5.8	9.7	5.2	19.5	17.5	4.2	53	2.8
11	30	27	3.4	5.2	93	36	16.5	8.8	9.6	3.6	24	2.8
12	35	128	3.8	3.7	42	14	60	5.6	6.6	3.3	22	2.9
13	24	14	3.2	3.1	15.5	9.6	74	5.0	5.3	3.7	11.5	2.9
14	9.0	7.6	3.0	2.7	8.6	8.3	25	4.5	4.7	3.9	19.5	2.8
15	6.9	7.2	2.8	2.5	6.9	7.4	14	4.5	4.3	3.3	15	2.8
16	5.9	6.1	2.6	2.4	6.5	6.9	10	7.6	4.0	8.3	9.0	10
17	5.2	5.8	4.5	2.5	17.5	56	16.5	7.1	3.8	5.4	7.6	39
18	4.7	18.5	19.5	3.0	232	37	28	5.1	3.8	3.7	6.8	11
19	4.7	12.5	8.4	2.8	190	13	11.5	7.4	3.8	60	29	5.4
20	5.6	6.6	6.6	2.4	27	18.5	8.8	13	11.5	164	19	3.9
21	4.6	4.7	5.6	2.2	18	46	7.9	8.7	6.1	17	9.6	3.3
22	4.1	4.2	3.8	2.0	30	15.5	7.4	14.5	8.9	11.5	7.2	3.2
23	4.0	3.8	7.5	4.6	24	20	6.9	18.5	[a]5.3	13.5	6.3	3.8
24	5.2	3.4	5.8	8.1	15.5	23	6.6	85	[b]4.8	9.2	7.1	7.7
25	4.0	3.1	3.8	21	15.5	12	6.1	40	[b]4.4	11	6.6	6.2
26	3.5	2.9	3.7	5.1	63	10	6.3	9.6	[b]4.1	29	5.5	19
27	3.3	2.9	3.4	3.6	25	8.8	5.9	6.6	[b]3.8	26	5.2	12
28	3.5	2.8	3.7	3.6	14.5	8.1	5.4	5.0	[b]3.4	18	4.7	23
29	3.8	2.6	2.9	41	10.5	25	5.2	-------	[a]3.0	9.9	4.6	8.2
30	6.9	2.6	7.3	21	9.4	10	5.1	-------	[a]12.5	9.2	4.4	5.3
31	15.5	3.1	-------	6.5	-------	7.9	8.3	-------	29	-------	4.1	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	118	3.3	15.7	24.3	488	1,490
August	128	2.6	14.5	22.4	450	1,380
September	30	2.6	6.98	10.8	210	643
October	44	2.0	9.16	14.2	284	871
November	232	2.6	33.4	51.7	1,000	3,080
December	174	6.9	23.5	36.4	728	2,240
January	74	5.1	12.7	19.6	394	1,210
February	85	4.2	11.9	18.4	333	1,020
March	89	3.0	12.7	19.6	394	1,210
April	164	3.3	17.9	27.7	537	1,650
May	53	4.1	12.2	18.9	379	1,160
June	39	2.8	6.90	10.7	207	635
The year	232	2.0	14.8	22.9	5,400	16,600

[a] Partly estimated. [b] Estimated.

KOKEE DITCH NEAR WAIMEA, KAUAI

LOCATION.—Water-stage recorder 1,000 feet west of road and 10½ miles north of Waimea.

RECORDS AVAILABLE.—September, 1926, to June, 1931.

EXTREMES.—Maximum discharge during year, 67 million gallons a day or 104 second-feet Dec. 2 (gage height, 2.67 feet); no flow occasionally when water was turned out of ditch just above weir.

1926–1931: Maximum discharge, 68 million gallons a day or 105 second-feet Dec. 24, 1927, Nov. 4, Dec. 2, 1929 (gage height, 2.70 feet); no flow occasionally when water was turned out of ditch just above weir.

REMARKS.—Records excellent except those estimated, which are fair. Kokee Ditch, at elevation 3,400 feet, diverts water from all streams tributary to Waimea River, east of and including Mohihi Stream, for irrigation near Kekaha. Regulated by head gates.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	28	50	22	38	7.7	21	12.5	12	8.8	12	12.5	5.7
2	57	21	20	14.5	6.8	50	11.5	9.3	48	40	14	5.6
3	29	25	40	10	6.0	56	11	8.3	58	23	10.5	5.2
4	23	13	27	16	5.6	35	11	7.4	30	11.5	10.5	5.1
5	25	12	13.5	22	5.4	30	11	6.9	25	8.6	10.5	5.1
6	23	9.0	10	27	7.8	26	10.5	6.6	17.5	9.0	8.8	5.1
7	24	8.3	9.2	18.5	16.5	26	10.5	6.5	12	11	13	4.8
8	24	7.1	10	10.5	43	37	10	6.3	10	14.5	12.5	4.8
9	14	5.8	9.0	9.5	15	22	9.7	9.0	11	8.4	14	4.5
10	12.5	13	7.6	9.2	9.3	20	9.3	17.5	25	6.8	41	4.5
11	29	38	7.3	9.1	50	41	18	11	14	6.0	25	4.5
12	37	49	8.1	7.4	60	24	36	7.9	10	5.7	21	4.5
13	36	24	7.1	6.6	35	18.5	51	6.8	8.3	5.8	13.5	4.5
14	16	14	6.9	6.2	20	17.5	30	6.5	7.6	6.2	17	4.4
15	13	12	6.8	5.8	16	16	16	6.3	6.9	5.6	15.5	4.4
16	11.5	11	6.5	5.8	14	15	12.5	7.4	6.6	8.8	10	8.8
17	10.5	10.5	6.5	6.3	21	39	15.5	8.4		7.6	8.6	30
18	9.5	19	19	6.6	50	43	32	6.9	6.5	5.8	8.1	11.5
19	9.5	22	15	6.6	64	22	14.5	6.8		12.5	24	6.6
20	10.5	11.5	11	6.0	47	21	11.5	12		56	24	5.2
21	9.3	9.3	10.5	5.7	31	52	10	9.2	9.5	23	11.5	4.7
22	8.4	8.3	8.1	5.2	28	25	9.5	12.5		13.5	8.4	4.5
23	8.1	8.1	10	7.0	26	23	9.3	14		15	7.7	4.7
24	9.3	7.3	10.5	10	28	32	9.0	40		11	7.9	7.1
25	8.1	6.9	7.4	24	28	20	8.4	50	7	13	7.6	5.8
26	7.4	3.0	6.9	9.7	34	17.5	8.8	18.5		28	6.9	14.5
27	7.1	1.0	6.8	7.3	27	15	8.3	11	[a] 6.6	29	6.6	10.5
28	7.3	2.7	6.9	6.9	26	13.5	7.8	9.3	6.0	22	6.5	18.5
29	7.4	6.2	6.3	25	25	30	7.4	-------	5.7	12	6.5	9.2
30	10	6.2	8.1	29	22	17.5	7.3	-------	12	11	6.2	6.0
31	12	6.9	-------	11	-------	13.5	8.3	-------	33	-------	5.8	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	57	7.1	17.3	26.8	536	1,650
August	50	1.0	14.2	22.0	441	1,350
September	40	6.3	11.5	17.8	344	1,060
October	38	5.2	12.3	19.0	382	1,170
November	64	5.4	25.8	39.9	775	2,380
December	56	13.5	27.1	41.9	839	2,580
January	51	7.3	14.1	21.8	438	1,340
February	50	6.3	11.9	18.4	334	1,020
March	58	5.7	14.2	22.0	440	1,350
April	56	5.6	14.7	22.7	442	1,350
May	41	5.8	12.8	19.8	396	1,220
June	30	4.4	7.34	11.4	220	676
The year	64	1.0	15.3	23.7	5,590	17,100

[a] Partly estimated.

WAIAHULU STREAM NEAR WAIMEA, KAUAI

LOCATION.—Water-stage recorder in Waimea Canyon, half a mile above confluence with Koaie Stream and 8¾ miles north of Waimea.

DRAINAGE AREA.—20.0 square miles.

RECORDS AVAILABLE.—February to October, 1916; October, 1917, to June, 1918; May, 1925, to June, 1931.

EXTREMES.—Maximum discharge during year, 1,420 million gallons a day or 2,200 second-feet Nov. 18 (gage height, 6.98 feet); minimum, 8.0 million gallons a day or 12.4 second-feet Aug. 30.

1916, 1917–18, 1925–1931: Maximum discharge, 2,550 million gallons a day or 3,950 second-feet Dec. 24, 1927 (gage height, 9.92 feet); minimum, 5.2 million gallons a day or 8.0 second-feet Nov. 4, 1927.

REMARKS.—Records fair for ordinary stages; poor for high stages and estimated periods. Kokee Ditch diverts water for irrigation above station.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	170	84	31	30	14	[a] 14	13.5	16	15.5	14	12.5	10.5
2	123	19.5	54	14.5	13.5	130	13		115	35	13	10.5
3	22	14.5	109	12.5	13		13	16.5	105	18	12.5	10.5
4	16	13	39	14	12.5		13		22	13	12	10.5
5	16.5	11.5	18	54	12		13		16.5	12	11.5	10.5
6	15	11	14	36	11	18	12.5	14	15	11	11.5	10.5
7	17.5	11.5	13	23	22		12.5		14	11	11.5	10
8	20	11	12.5	17	73		12.5		13	13	11.5	9.9
9	15	10.5	11.5	14.5	15		12.5		13	11	11.5	9.6
10	14.5	57	11	14	15.5		12.5		13.5	11	14	9.6
11	20	58	10.5	12.5	246	[a] 26	14	15	15	10.5	16.5	9.6
12	20	217	10.5	12.5	174		37		13	10	13	9.4
13	25	19.5	10	12	56		46		12.5	10	12.5	9.4
14	17	13.5	10.5	12	26	14	19.5		12	10	12	9.4
15	15	12.5	10.5	12	20		14.5		11	10	12	9.6
16	14.5	12	10	12	18.5			12	11	10	12.5	9.6
17	14.5	11.5	10.5	12.5	17.5	50			11	10	12	12
18	14	11.5	10.5	12.5	383				11	10	12	12
19	14	13	11	12.5	[a] 300	17			11	120	23	10
20	14	12.5	18.5	12		15		14			18.5	9.6
21	14	12	16	12		31	13		12		14	9.4
22	14.5	11	12.5	12		18		15	11.5		13	9.4
23	14.5	11	12	12		15		16.5	11	13	12	9.4
24	14.5	11	11.5	12.5	32	17.5		35	11		12	9.2
25	14	11	11	13.5		16		54	11		11.5	9.4
26	13.5	12	11	14		15		18	11		11.5	9.4
27	13	15	11	13.5		14		15.5	11	22	11.5	10.5
28	13	13.5	11	13.5		14		15	11		11	10
29	13	9.9	11	16	14	16.5	14	-------	11	12	11	10.5
30	12.5	8.7	13	29		15		-------	12	12.5	10.5	10
31	14.5	15	-------	15.5	-------	14		-------	20	-------	10.5	------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	170	12.5	24.1	37.3	748	2,290
August	217	8.7	24.3	37.6	755	2,310
September	109	10	18.2	28.2	546	1,680
October	54	12	16.6	25.7	516	1,580
November	383	11	58.0	89.7	1,740	5,340
December	-------	-------	26.3	40.7	814	2,500
January	46	-------	15.2	23.5	472	1,450
February	54	-------	16.5	25.5	462	1,420
March	115	11	19.1	29.6	594	1,820
April	-------	10	20.8	32.2	625	1,910
May	23	10.5	12.7	19.6	394	1,210
June	12	9.2	10.0	15.5	300	921
The year	383	8.7	21.8	33.7	7,970	24,400

[a] Estimated.

KOAIE STREAM AT ELEVATION 3,700 FEET, NEAR WAIMEA, KAUAI

LOCATION.—Water-stage recorder at elevation 3,700 feet, 12½ miles N. 30° E. from Waimea.

DRAINAGE AREA.—3.4 square miles.

RECORDS AVAILABLE.—July, 1919, to June, 1931.

EXTREMES.—Maximum discharge during year, 896 million gallons a day or 1,390 second-feet Nov. 18 (gage height, 2.78 feet); minimum, 0.9 million gallons a day or 1.4 second-feet June 6.

1919–1931: Maximum discharge, about 3,750 million gallons a day or 5,800 second-feet Jan. 16, 1921 (gage height, 6.70 feet); minimum, 0.6 million gallons a day or 0.9 second-foot May 21, 22, 1929.

REMARKS.—Records good except those for high stages and for estimated periods, which are poor. No diversions.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	38	80	25	38	2.9	2.7	2.3	11.5	3.2	4.5	3.9	1.2
2	82	15.5	41	6.1	2.5	48	2.1	8.0	122	35	5.4	1.2
3	30	14.5	50	7.1	2.1	36	2.1	3.2	36	11.5	2.8	1.2
4	8.6	6.5	12.5	5.7	1.9	8.9	1.9	2.3	12	3.6	2.4	1.1
5	6.5	4.5	4.9	26	1.9	7.1	2.3	1.9	9.1	2.8	1.8	1.1
6	6.1	24	3.9	28	1.9	4.8	2.5	1.8	7.0	4.5	1.8	1.0
7	6.1	5.3	5.4	9.5	18	4.5	2.3	1.6	5.3	9.7	2.0	1.0
8	5.7	3.6	6.1	4.5	26	5.2	8.1	1.6	4.9	6.1	2.6	1.0
9	4.2	[a] 3.0	3.6	4.8	5.2	4.5	4.2	2.9	6.6	2.8	2.6	1.0
10	3.9		3.0	5.2	14.5	5.7	2.7	3.8	9.1	2.0	13.5	1.0
11	9.6	60	34	4.8	160	13	8.8	2.9	11.5	1.8	9.2	1.0
12	13.5		5.4	3.2	91	6.1	18	2.1	8.1	1.6	6.5	1.0
13	14.5	[a] 12.5	3.3	2.7	15	3.8	48	1.8	6.1	1.6	4.2	1.0
14	5.3	5.7	2.6	2.3	4.8	3.5	14.5	3.1	4.9	1.5	7.2	1.0
15	3.6	12	16.5	2.1	4.2	2.9	6.1	4.5	4.5	1.3	5.7	1.2
16	3.0	8.6	8.0	2.3	4.2	14.5	3.8	7.5	3.9	2.0	3.3	8.8
17	2.6	13.5	5.5	3.8	13.5	28	3.2	4.6	3.6	3.0	2.8	38
18	2.6	17	9.6	7.1	160	31	3.8	2.5	3.6	2.6	2.8	4.3
19	5.3	17.5	3.2	4.8	210	5.2	2.7	2.7	4.2	21	5.5	2.2
20	17	11.5	3.6	2.9	7.0	5.6	2.3	8.6	9.1	39	4.9	1.5
21	5.3	9.1	5.9	2.5	4.5	19	2.1	4.8	7.0	5.2	2.8	1.3
22	13.5	11.5	7.0	2.1	4.2	6.6	1.9	19.5		3.0	2.2	1.3
23	5.3	4.9	16.5	8.5	4.5	7.1	1.8	15		2.4	2.0	7.1
24	4.9	3.6	6.5	11.5	4.5	8.3	1.6	24		2.0	2.0	5.8
25	3.6	3.0	5.3	18.5	4.2	10.5	1.6	30	2.9	2.6	1.8	4.9
26	2.8	3.0	5.7	4.2	7.7	5.2	1.8	4.8		2.4	1.5	13
27	3.0	3.6	14	2.9	15.5	3.5	1.8	13.5		2.2	1.5	5.3
28	3.9	3.3	9.1	3.2	5.2	3.0	1.6	4.8	[a] 2.6	2.0	1.5	9.6
29	3.0	2.8	6.5	14.5	4.5	23	1.6	-------	2.0	1.8	1.5	3.9
30	7.6	3.9	13	13.5	2.9	4.5	1.6	-------	7.5	2.2	1.5	2.4
31	102	10.5	-------	4.5	-------	2.9	3.4	-------	13	-------	1.3	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	102	2.6	13.6	21.0	423	1,290
August	----------	2.8	15.9	24.6	494	1,510
September	50	2.6	11.2	17.3	337	1,030
October	38	2.1	8.28	12.8	257	788
November	210	1.9	26.8	41.5	804	2,470
December	48	2.7	10.8	16.7	335	1,030
January	48	1.6	5.24	8.11	162	499
February	30	1.6	6.98	10.8	195	600
March	122	2.0	10.5	16.2	324	999
April	39	1.3	6.12	9.47	184	563
May	13.5	1.3	3.56	5.51	110	339
June	38	1.0	4.18	6.47	125	385
The year	210	1.0	10.3	15.9	3,750	11,500

[a] Partly estimated.

WAIALAE RIVER AT ELEVATION 3,700 FEET, NEAR WAIMEA, KAUAI

LOCATION.—Water-stage recorder at elevation 3,700 feet, 10½ miles N. 30° E. from Waimea.

DRAINAGE AREA.—3.3 square miles.

RECORDS AVAILABLE.—January, 1920, to June, 1931. August, 1910, to January, 1916, at site 2 miles downstream.

EXTREMES.—Maximum discharge during year, 1,490 million gallons a day or 2,310 second-feet July 31 (gage height, 4.61 feet); minimum, 0.7 million gallons a day or 1.1 second-feet June 14, 15.

1920–1931: Maximum discharge, estimated, 4,500 million gallons a day or 6,960 second-feet Jan. 16, 1921 (gage height, 8.44 feet); minimum, 0.7 million gallons a day or 1.1 second-feet Mar. 18–20, 1925, June 14, 15, 1931.

REMARKS.—Records good for ordinary stages; poor for extremely high and low stages and estimated periods. No diversions.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	21	143	46	23	[a] 4.6	2.2	2.2	7.6	3.4	4.1	6.9	1.0
2	74	13.5	69	5.6		22	2.1	5.8	129	20	6.3	1.0
3	21	12.5	80	5.8		17.5	1.9	2.8	25	11	2.8	1.0
4	6.6	5.1	15.5	4.6	1.8	5.1	1.7	2.1	8.4	4.1	2.1	1.0
5	4.6	3.6	7.0	36		3.4	2.2	1.7	5.6	2.9	1.6	1.0
6	4.4	7.6	5.1	38		2.8	2.1	1.4	4.4	3.6	1.4	.9
7	4.8	3.8	5.6	13		2.6	2.1	1.4	2.9	7.0	1.4	.9
8	3.4	2.4	6.3	5.6		2.6	7.4	1.4	2.4	4.8	1.9	.9
9	2.8	1.9	4.1	5.6	20	2.6	3.8	1.7	2.6	2.8	1.9	.9
10	2.4	18	3.1	[a] 9.3		2.4	2.4	2.1	5.5	2.1	6.9	.9
11	3.4	57	37	[a] 8.0	196	3.1	6.7	1.9	5.1	1.7	7.0	.8
12	5.2	114	6.3	[a] 4.6	103	2.9	12.5	1.3	2.9	1.4	3.8	.9
13	8.6	9.6	3.8	[a] 3.8	15	2.4	29	1.3	2.2	1.4	2.8	.9
14	3.6	5.1	3.1	[a] 3.4	5.9	2.1	9.6	2.6	1.9	1.4	3.8	.8
15	2.8	10.5	12	[a] 2.9	4.4	1.9	4.8	3.4	1.7	1.4	3.6	.9
16	2.1	8.0	8.2	[a] 3.4	4.1	11	3.1	6.0	1.4	1.9	2.2	10.5
17	1.6	10.5	5.4	[a] 3.6	9.1	17	2.6	4.0	1.4	2.6	1.7	32
18	1.6	13.5	4.1		146	22	2.4	2.2	1.7	2.4	2.2	3.7
19	3.0	25	3.4		160	5.4	2.1	2.8	2.7	4.4	3.7	1.6
20	11.5	13	6.6		11.5	3.8	1.7	8.0	5.1	22	3.8	1.1
21	3.8	8.0	5.6		8.3	12	1.4	4.6	2.8	4.6	2.2	1.0
22	13.5	10.5	5.6		5.4	5.9	1.4	17.5	2.2	2.6	1.6	1.4
23	4.6	4.8	14.5	4.5	4.6	6.3	1.4	11.5	1.7	2.1	1.3	6.3
24	3.8	3.6	5.1		4.1	7.3	1.3	19	1.7	1 6	1.2	4.6
25	2.6	2.9	3.6		3.4	8.8	1.2	23	2.1	1.9	1.1	4.8
26	2.1	2.8	3.8		4.6	5.4	1.6	4.8	2.4	1.9	1.1	9.9
27	2.1	2.6	9.7		6.6	3.4	1.6	11.5	3.8	1.9	1.1	4.4
28	2.1	2.6	6.6	[a] 3.6	3.8	2.9	1.3	4.6	2.9	1.6	1.2	6.7
29	1.7	2.4	4.4	[a] 4.8	2.8	12	1.2	-------	2.2	1.4	1.2	3.3
30	6.7	2.9	4.5	[a] 7.6	2.4	4.4	1.1	-------	8.8	2.6	1.0	2.2
31	153	15	-------	[a] 4.6	-------	2.8	2.4	-------	9.8	-------	1.0	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	153	1.6	12.4	19.2	384	1,180
August	143	1.9	17.3	26.8	536	1,650
September	80	3.1	13.2	20.4	395	1,220
October	38	----------	7.80	12.1	242	742
November	196	----------	26.5	41.0	795	2,440
December	22	1.9	6.65	10.3	206	633
January	29	1.1	3.82	5.91	118	363
February	23	1.3	5.64	8.73	158	485
March	129	1.4	8.25	12.8	256	785
April	22	1.4	4.17	6.45	125	384
May	7.0	1.0	2.64	4.08	81.8	251
June	32	.8	3.58	5.54	107	330
The year	196	.8	9.33	14.4	3,400	10,500

[a] Partly estimated from staff-gage reading, twice daily.

KEKAHA DITCH AT CAMP NO. 1, NEAR WAIMEA, KAUAI

LOCATION.—Water-stage recorder in Waimea Canyon, 6¼ miles N. 16° E. of Waimea.

RECORDS AVAILABLE.—November, 1907, to June, 1915; March, 1916, to June, 1931.

EXTREMES.—Maximum discharge during year, 64 million gallons a day or 99 second-feet July 31 (gage height, 4.10 feet); no flow occasionally when water was shut out of ditch.

1907–1931: Maximum discharge, 71 million gallons a day or 110 second-feet Apr. 25, 1928 (gage height, 4.33 feet); no flow occasionally when water was shut out of ditch.

REMARKS.—Records good for ordinary stages except those estimated, which are fair; poor for extremely low stages. Intake on Waimea River 8 miles north of Waimea. Water used for irrigation of sugarcane at Kekaha plantation. Regulated by head gates.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	44			[a] 34		41	3.8	39	36	9.6	36	25
2	56	50		47		47	4.2	50	47	16.5	47	24
3	56			44		44	10	36	53	39	33	24
4	53			50	30	50	9.6	31	53	41	30	24
5	47			32		50	9.4	29	50	33	28	24
6	44	38		36		47	24	28	44	33	26	24
7	41			39		44	33	28	36	44	26	23
8	47			50		44	39	26	33	44	26	23
9	36			53		44	41	28	32	36	28	23
10	33			53	40	41	33	30	36	30	33	23
11	39		44	53		47	39	32	44	28	50	23
12	50	55		47		47	50	29	36	28	39	23
13	56			41	18	41	53	28	32	26	37	23
14	44			39	18	39	53	26	30	26	32	22
15	36	50		36	17	39	50	32	29	26	39	23
16	33	53		36	22	44	39	30	28	26	32	26
17	32	50			39	53	36	39	28	28	29	53
18	30			44	33	53	36	30	28	29	30	44
19	30				19	50	33	29	32	29	41	30
20	50			[b] 39	25	41	32	36	36	50	47	25
21	39	50		36	28	53	30	36	33	47	36	24
22	47			33	32	53	30	47	32	36	30	24
23	39			[b] 33	32	47	29	47	30	32	28	29
24	36				39	53	29	53	28	29	26	36
25	32			26	39	53	29	53	29	32	26	29
26	30		36		39	47	30	50	29	32	25	46
27	29	40		[b] 36	41	36	32	44	30	32	26	39
28	29			36	47	7.1	29	41	32	30	26	39
29	29			39	41	7.5	28	-------	29	29	25	39
30	33			50	41	4.5	28	-------	33	30	25	28
31	45		-------	47	-------	3.7	28	-------	46	-------	25	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	56	29	40.2	62.2	1,240	3,820
August	----------	----------	45.5	70.4	1,410	4,330
September	----------	----------	41.9	64.8	1,260	3,860
October	53	----------	40.3	62.4	1,250	3,830
November	----------	17	32.7	50.6	980	3,010
December	53	3.7	41.0	63.4	1,270	3,900
January	53	3.8	30.6	47.3	950	2,910
February	53	26	36.0	55.7	1,010	3,090
March	53	28	35.3	54.6	1,090	3,360
April	50	9.6	31.7	49.0	951	2,920
May	50	25	31.8	49.2	987	3,030
June	53	22	28.7	44.4	862	2,640
The year	----------	3.7	36.3	56.2	13,300	40,700

[a] Estimated. [b] Partly estimated.

KEKAHA DITCH BELOW TUNNEL No. 12, NEAR WAIMEA, KAUAI

LOCATION.—Water-stage recorder 1 mile north of Waimea, just above diversion for Waimea domestic water supply.

RECORDS AVAILABLE.—April, 1908, to November, 1914; July, 1916, to June, 1931.

EXTREMES.—Maximum discharge during year, 53 million gallons a day or 82 second-feet Aug. 31 (gage height, 4.23 feet); minimum, 4.1 million gallons a day or 6.3 second-feet Apr. 1.

1908–1914; 1916–1931: Maximum discharge, 70 million gallons a day or 108 second-feet Dec. 24, 1927 (gage height, 5.17 feet); no flow occasionally when water is shut out of ditch.

REMARKS.—Records good except those estimated, which are fair. Intake on Waimea River 8 miles north of Waimea. Water used for irrigation of sugarcane at Kekaha plantation. Regulated by head gates.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	43		39	28	31	34				6.2	32	
2	50	46	32	39	23	39				11.5	43	
3	50		16.5	38	27	37	4.0			35	32	
4	48		23	43	25	39			40	37	27	
5	44		41	30	25	39				30	25	
6	41	32	41	32	25	39				29	24	
7	39		36	34	25	36				36	24	
8	44		45	41	45	37				39	24	
9	36		43	45	43	37				32	25	20
10	32		37	45	36	34				27	25	
11	34		43	45	22	37	36	26		24	45	
12	46	46	46	41	17.5	39				22	36	
13	48		37	36	15	34				21	34	
14	44		34	32	15	32			28	22	29	
15	34		39	30	15	32				21	36	
16	32	[a] 44	43	30	18.5	34				22	30	
17	30	43	41	34	34	43				22	27	
18	29	44	15	39	27	43				24	27	
19	29	44	30	41	16.5	43				24	34	
20	41	44	41	34	22	37				44		
21	41	39	43	30	22	43	28			45		30
22	40	44	41	29	25	44			[a] 29	32		
23	41	36	21	30	27	39			27	29		
24	34	30	30	37	30	43			25	27		
25	32	29	21	16.5	32	43		40	27	29	26	
26	29	29	29	15	32	41			27	29		
27	27	34	34	32	36	35	[a] 27		27	29		37
28	28	34	41	32	39		25		29	27		32
29	29	35	34	34	36	2.6	24	-------	27	25		36
30	27	34	29	45	34		23	-------	29	27		[a] 25
31	[b] 40	39	-------	41	-------		[a] 23	-------	42	-------		-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	50	27	37.5	58.0	1,160	3,570
August	----------	----------	39.0	60.3	1,210	3,710
September	46	15	34.8	53.8	1,050	3,200
October	45	15	34.8	53.8	1,080	3,310
November	45	15	27.4	42.4	820	2,520
December	44	----------	33.7	52.1	1,040	3,210
January	----------	----------	26.1	40.4	810	2,480
February	----------	----------	29.5	45.6	826	2,530
March	----------	----------	30.6	47.3	949	2,910
April	45	6.2	27.6	42.7	828	2,540
May	45	----------	28.7	44.4	891	2,730
June	----------	----------	25.0	38.7	750	2,300
The year	50	----------	31.3	48.4	11,400	35,000

[a] Partly estimated. [b] Estimated.

HANAPEPE RIVER AT KOULA, NEAR ELEELE, KAUAI

LOCATION.—Water-stage recorder just below junction with Manuahi Stream, 500 feet below siphon at Koula and 4 miles northeast of Eleele.

DRAINAGE AREA.—18.8 square miles.

RECORDS AVAILABLE.—August, 1910, to January, 1921; December, 1926, to June, 1931.

EXTREMES.—Maximum discharge during year, 1,030 million gallons a day or 1,590 second-feet July 31 (gage height, 5.43 feet); minimum, 12 million gallons a day or 18.6 second-feet Mar. 18.

1910–1921, 1926–1931: Maximum discharge, at least 5,000 million gallons a day or 7,740 second-feet Dec. 18, 1916 (at old station above mouth of Manuahi Stream, gage height not known as station was destroyed by this flood); minimum, 7.1 million gallons a day or 11.0 second-feet Dec. 30, 31, 1913.

REMARKS.—Records fair for ordinary stages and estimated periods; poor for extremely high stages. Hanapepe Ditch diverts water from river 3 miles above station for irrigation.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	44	[a]307	184	146	19.5	19.5	14.5	16.5	18	13.5	13.5	13.5
2	140	[a]116	210	51	18.5	20	15	15	46	13.5	13	13.5
3	120	[a]80	243	47	18	28	15.5	14.5	66	14	13	13
4	66	[a]45	172	36	17.5	20	16	14.5	27	13	12.5	12.5
5	47	[a]35	105	101	17.5	18.5	21	14.5	19.5	13	13	12.5
6	31	[a]106	107	170	17.5	17.5	16.5	13	15	16	12.5	13.5
7	25	[a]42	75	101	27	18	50	12.5	14	19.5	12.5	13.5
8	37	[a]25	46	57	33	18	83	12.5	14	15	13.5	13.5
9	22	[a]18.5	36	44	28	18	23	12.5	14.5	13.5	13.5	14
10	20	[a]66	40	52	46	17.5	17.5	13	16.5	13	23	14
11	23	[a]207	167	47	261	17	21	13	23	13	18.5	14
12	22	[a]231	57	43	190	17	41	12.5	15	13	34	14
13	42	[a]80	39	31	95	17	84	12.5	13	12.5	15	14
14	21	[a]55	42	26	46	19	57	27	12.5	12.5	19.5	14
15	17.5	[a]76	90	25	35	17	28	16	13	12.5	16.5	15
16	17	[a]54	135	30	29	48	20	37	12.5	13.5	16	61
17	16	[b]111	104	26	45	42	18	19	12.5	14.5	15.5	78
18	15	80	71	22	109	49	17	14.5	12	13	15.5	17.5
19	23	139	44	21	394	23	16.5	16	15.5	21	16	14.5
20	57	95	85	20	105	18.5	16.5	15.5	17	15.5	15.5	14.5
21	29	85	84	20	68	20	16.5	13.5	23	13.5	15	14.5
22	80	110	81	21	53	18	16	19	14.5	12.5	14.5	20
23	52	61	92	29	51	16	16.5	25	13.5	12.5	14.5	30
24	39	53	47	32	35	16.5	16.5	52	13.5	12.5	15.5	22
25	23	86	36	39	27	28	16	48	14.5	12.5	15	24
26	24	75	32	21	30	21	16.5	18.5	14	12.5	15	34
27	26	61	49	25	23	16	17	49	15	12.5	16	25
28	20	47	43	23	21	22	16.5	35	13.5	13	16	53
29	18.5	91	43	25	20	19.5	16.5	-------	13.5	13	16	20
30	40	66	159	46	19.5	15	16.5	-------	18	13.5	16	22
31	[b]163	105	-------	25	-------	15	18	-------	19	-------	14.5	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	163	15	42.6	65.9	1,320	4,050
August	307	18.5	90.6	140	2,810	8,620
September	243	32	90.6	140	2,720	8,340
October	170	20	45.2	69.9	1,400	4,300
November	394	17.5	63.3	97.9	1,900	5,830
December	49	15	21.6	33.4	670	2,050
January	84	14.5	25.0	38.7	774	2,380
February	52	12.5	20.8	32.2	582	1,790
March	66	12	18.3	28.3	568	1,740
April	21	12.5	13.8	21.4	413	1,270
May	34	12.5	15.8	24.4	490	1,500
June	78	12.5	21.8	33.7	654	2,010
The year	394	12	39.2	60.7	14,300	43,900

[a] Estimated. [b] Partly estimated.

HANAPEPE RIVER AT MAKAI SIPHON NEAR ELEELE, KAUAI

LOCATION.—Water-stage recorder on right end of makai siphon bridge 2⅓ miles northeast of Eleele.

DRAINAGE AREA.—20.5 square miles.

RECORDS AVAILABLE.—December, 1929, to June, 1931.

EXTREMES.—Maximum discharge during year, 1,100 million gallons a day or 1,700 second-feet July 31 (gage height, 5.28 feet); minimum, 11.4 million gallons a day or 17.6 second-feet Apr. 26.

1929–1931: Maximum discharge, that of July 31, 1930; minimum, that of Apr. 26, 1931.

REMARKS.—Records good for ordinary stages and estimated periods; poor for high stages. Hanapepe Ditch and several small ditches divert water from stream above station.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	45	361	200	155	17.5	18.5	15	16	17	13.5	13	
2	162	124	201	55	17.5	21	15	15	44	13	13	
3	129	90	245	51	17	28	15	14.5	70	13.5	12.5	
4	69	49	182	40	16.5	18.5	15	14.5	28	12.5	12.5	
5	52	41	107	110	16.5	18	20	14	18	12.5	12	
6	33	113	115	170	16	17	15	14	15	14.5	12.5	
7	27	43	78	113	23	16.5	42	13	14.5	17.5	12.5	
8	42	27	49	62	30	17	94	13	14.5	14.5	13.5	13
9	25	21	37	47	22	16.5	24	12.5	15	13	13	
10	22	69	37	56	39	15.5	16.5	13	17	12.5		
11	25	228	175	52	258	15.5	18.5	13	25	12	28	
12	24	249	59	47	187	15.5	37	12.5	15.5	12		
13	49	94	41	33	102	16	86	12.5	14	12.5		
14	25	65	41	27	43	18	57	26	13.5	12.5		
15	19	90	97	25	31	16	27	15	13.5	12.5		
16	19	54	136	30	25	47	18	35	13	13.5		70
17	18	121	112	26	42	41	16.5	18.5	13	14		
18	17.5	84	83	22	148	49	15.5	14.5	13	12.5		
19	24	144	44	21	319	22	15	16	15	20		
20	62	97	94	19.5	107	17.5	15	15	18	15		15
21	35	82	80	18.5	70	19.5	15	14	22	12.5	15	
22	87	111	97	19.5	52	17.5	14.5	18.5	14.5	12		
23	56	62	97	29	49	15.5	14.5	24	13.5	12		
24	46	54	51	28	31	16	14.5	54	13.5	12		
25	27	86	38	44	25	27	14.5	50	14	13		
26	32	74	33	19.5	30	19.5	15	17	14.5	12		28
27	32	62	51	23	23	16	14.5	52	14.5	12		
28	23	47	46	23	19.5	19.5	14	36	13.5	12		
29	22	92	47	21	18.5	18.5	14	-------	13	12		
30	44	70	161	47	18.5	15	14	-------	16	12.5		
31	169	101	-------	24	-------	15	15	-------	19	-------		-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	169	17.5	47.1	72.9	1,460	4,480
August	361	21	96.9	150	3,000	9,220
September	245	33	94.5	146	2,830	8,700
October	170	18.5	47.0	72.7	1,460	4,470
November	319	16	60.4	93.5	1,810	5,560
December	49	15	20.7	32.0	643	1,970
January	94	14	23.8	36.8	736	2,260
February	54	12.5	20.8	32.2	583	1,790
March	70	13	18.5	28.6	574	1,760
April	20	12	13.2	20.4	396	1,220
May	----------	----------	15.6	24.1	484	1,480
June	----------	----------	21.6	33.4	647	1,990
The year	361	----------	40.1	62.0	14,600	44,900

HANAPEPE DITCH BELOW INTAKE NEAR ELEELE, KAUAI

LOCATION.—Water-stage recorder 1 mile below intake and 7 miles northeast of Eleele.

RECORDS AVAILABLE.—March, 1930, to June, 1931.

EXTREMES.—Maximum discharge during year, 35 million gallons a day or 54 second-feet July 22 (gage height, 3.59 feet); no flow occasionally when water was shut out of ditch.

1930–31: Maximum discharge, that of July 22, 1930; no flow occasionally, owing to closing of head gates.

REMARKS.—Records good. Ditch diverts water from Hanapepe River at intake 1 mile above station.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	32	33	33	33	26	26	23	[a] 28	32	23	19	[a] 17
2	32	33	22	32	26	26	23	[a] 25	33	26	18.5	[a] 17
3	32	32	.8	32	25	30	23	[a] 23	33	23	18	[a] 18
4	32	32	0	32	23	28	23	[a] 23	33	22	17	[a] 20
5	32	30	0	32	23	26	28	[a] 23	32	22	17	[a] 18
6	30	32	0	30	23	25	25	[a] 23	28	28	[a] 17	[a] 17
7	30	30	0	32	26	25	32	23	26	30	[a] 18	[a] 16
8	32	30	23	32	28	26	33	23	26	26	[a] 18	[a] 16
9	28	30	25	32	26	25	[a] 30	25	28	23	[a] 17	[a] 16
10	26	33	26	30	28	25	[a] 30	26	30	22	[a] 24	[a] 17
11	30	33	28	30	32	25	[a] 32	23	33	22	20	[a] 16
12	30	33	28	30	32	25	[a] 32	23	28	20	25	[a] 18
13	32	33	28	28	32	25	[a] 33	23	26	20	19	[a] 17
14	28	33	28	28	32	22	[a] 33	30	25	20	25	[a] 16
15	26	33	30	28	32	25	[a] 32	25	25	20	19	[a] 18
16	26	33	32	28	30	32	[a] 32	33	25	23	20	[a] 20
17	25	33	32	28	32	32	[a] 30	26	23	22	18.5	[a] 32
18	25	32	32	28	32	32	[a] 28	26	25	22	20	[a] 25
19	30	33	30	28	33	30	[a] 28	30	28	25	18.5	[a] 19
20	33	33	32	26	32	28	[a] 25	28	26	23	18	[a] 18
21	32	33	[a] 29	26	32	30	[a] 25	26	32	20	17	[a] 17
22	33	33	[a] 32	26	32	26	[a] 25	30	25	19	16.5	[a] 19
23	33	33	[a] 32	32	32	26	[a] 25	32	25	19	16.5	26
24	32	26	[a] 29	32	30	26	[a] 25	35	25	19	18.5	22
25	30	33	[a] 29	32	30	28	[a] 23	33	26	20	16.5	22
26	32	33	[a] 29	28	30	26	[a] 25	32	26	19	[a] 16	28
27	30	33	32	28	28	25	[a] 23	35	26	19	[a] 16	26
28	28	33	32	24	28	23	[a] 23	33	23	18.5	[a] 16	30
29	26	33	32	28	26	25	[a] 23	-------	23	18.5	[a] 15	22
30	30	33	33	32	26	23	[a] 23	-------	26	19	[a] 14	22
31	33	33	-------	30	-------	23	[a] 25	-------	26	-------	[a] 16	------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	33	25	30.0	46.4	930	2,850
August	33	26	32.3	50.0	1,000	3,070
September 1–3, 8–30	33	.8	28.4	43.9	739	2,270
October	33	24	29.6	45.8	917	2,820
November	33	23	28.9	44.7	867	2,660
December	32	22	26.4	40.8	819	2,510
January	33	23	27.1	41.9	840	2,580
February	35	23	27.3	42.2	765	2,350
March	33	23	27.4	42.4	848	2,610
April	30	18.5	21.8	33.7	653	2,010
May	25	14	18.2	28.2	564	1,730
June	32	16	20.2	31.3	605	1,860
The year (361 days)	35	.8	26.4	40.8	9,550	29,300

[a] Estimated.

NOTE.—No flow Sept. 4–7, owing to artificial regulation.

HANAPEPE DITCH AT KOULA, NEAR ELEELE, KAUAI

LOCATION.—Water-stage recorder at first flume below siphon at Koula, 4 miles below intake and 4 miles north of Eleele.

RECORDS AVAILABLE.—January, 1910, to June, 1921; March, 1927, to June, 1931.

EXTREMES.—Maximum discharge recorded during year, 35 million gallons a day or 54 second-feet Aug. 1 (gage height, 3.06 feet); no flow for several days when water was shut out of ditch.

1910–1921, 1927–1931: Maximum discharge, 36 million gallons a day or 56 second-feet Apr. 10, 1918 (gage height, 3.18 feet); no flow occasionally, owing to closing of head gates.

REMARKS.—Records good. Diverts water for irrigation from Hanapepe River 4 miles above station. Regulated by head gates and spillways.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	28	33	[a] 19	[a] 30	[a] 25	26	[a] 13	24	24	18.5	16	[a] 15.5
2	30	33	[a] 12	[a] 28	[a] 25	23	[a] 19.5	23	28	20	15	[a] 15.5
3	30	30	[a] 0	[a] 28	[a] 23	26	[a] 21	21	28	18.5	15	[a] 16
4	28	30	[a] 0	[a] 28	[a] 21	24	[a] 21	21	28	17.5	15	[a] 17
5	28	28	[a] 0	[a] 28	[a] 20	24	[a] 24	21	26	17.5	15	[a] 16
6	26	28	[a] 0	[a] 30	20	24	[a] 22	20	24	21	15	[a] 15
7	24	28	[a] 3.0	[a] 30	23	24	[a] 24	20	23	23	15	[a] 14.5
8	26	26	[a] 22	[a] 30	24	24	[a] 27	20	21	21	15	[a] 14.5
9	24	26	[a] 24	[a] 28	23	24	[a] 25	20	23	18.5	14	[a] 14.5
10	24	28	[a] 24	[a] 28	24	23	[a] 25	21	24	17.5	18.5	[a] 15
11	24	30	[a] 28	[a] 28	28	23	[a] 27	20	26	17.5	17.5	[a] 14.5
12	26	30	[a] 26	[a] 28	[a] 27	23	[a] 27	18.5	23	16	21	[a] 16
13	28	30	[a] 26	[a] 28	[a] 20	21	[a] 28	18.5	21	17.5	16	[a] 15
14	24	28	[a] 26	[a] 28	[a] 27	19.5	[a] 28	23	21	16	20	[a] 14.5
15	23	28	[a] 28	[a] 25	[a] 28	21	[a] 27	21	20	16	16	[a] 16
16	[a] 23	28	[a] 28	[a] 28	[a] 27	28	[a] 27	26	20	18.5	16	[a] 18.5
17	[a] 21	30	[a] 30	[a] 28	[a] 27	28	[a] 25	23	20	18.5	15	[a] 28
18	[a] 21	[a] 30	[a] 28	[a] 25	[a] 28	28	[a] 24	21	20	17.5	16	[a] 21
19	[a] 25	[a] 28	[a] 27	[a] 25	[a] 29	26	[a] 24	23	23	20	15	[a] 17.5
20	[a] 28	[a] 28	[a] 27	[a] 25	[a] 29	24	[a] 22	24	22	20	14	[a] 15.5
21	[a] 30	[a] 30	24	[a] 24	[a] 29	26	[a] 22	21	24	17.5	14	[a] 15
22	[a] 32	[a] 30	28	[a] 25	[a] 25	23	[a] 22	24	20	16	[b] 13	[a] 17.5
23	[a] 32	[a] 28	28	[a] 28	[a] 15	24	[a] 22	26	20	16	[a] 14.5	21
24	[a] 28	[a] 19	26	[a] 28	[a] 23	24	[a] 22	28	20	16	[a] 15.5	18.5
25	[a] 26	[a] 27	26	[a] 30	[b] 30	16.5	[a] 21	28	21	16	[a] 14.5	18.5
26	[a] 25	[a] 30	26	[a] 28	30	20	[a] 22	26	21	16	[a] 14.5	23
27	24	[a] 30	[a] 28	[a] 27	28	[a] 24	[a] 21	28	21	15	[a] 14.5	21
28	21	[a] 30	[a] 28	[a] 25	28	14.5	[a] 21	28	18.5	15	[a] 14.5	21
29	21	[a] 31	[a] 29	[a] 25	26	20	[a] 21	-------	18.5	15	[a] 14	18.5
30	23	[a] 31	[a] 30	[a] 28	26	17	[a] 21	-------	20	16	[a] 13	19
31	26	[a] 31	-------	[a] 28	-------	13	[a] 22	-------	21	-------	[a] 15	------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	32	21	25.8	39.9	799	2,450
August	33	19	28.9	44.7	897	2,750
September 1–2, 7–30	30	3.0	25.0	38.7	651	1,990
October	30	24	27.5	42.5	852	2,620
November	30	15	25.3	39.1	758	2,330
December	28	13	22.8	35.3	706	2,170
January	28	13	23.1	35.7	718	2,200
February	28	18.5	22.8	35.3	638	1,960
March	28	18.5	22.3	34.5	690	2,120
April	23	15	17.6	27.2	529	1,620
May	21	13	15.4	23.8	477	1,470
June	28	14.5	17.4	26.9	523	1,600
The year (361 days)	33	3.0	22.8	35.3	8,240	25,300

[a] Estimated. [b] Partly estimated.

NOTE.—No flow Sept. 3–6, owing to artificial regulation.

HANAPEPE DITCH BELOW MAKAI SIPHON NEAR ELEELE, KAUAI

LOCATION.—Water-stage recorder 60 feet south of right end of makai siphon 2⅓ miles northeast of Eleele.

RECORDS AVAILABLE.—December, 1929, to June, 1931.

EXTREMES.—Maximum discharge during year, 30 million gallons a day or 46 second-feet Nov. 20, 21 (gage height, 2.67 feet); no flow occasionally when water was shut out of ditch.

1929–1931: Maximum discharge, that of Nov. 20, 21, 1930; no flow occasionally, owing to closing of head gates.

REMARKS.—Records good. Ditch diverts water from Hanapepe River at intake, 6 miles above station.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	27	[a] 28	18	28	25	24	13	24	25	19.5	17.5	15.5
2	28	[a] 28	12.5	27	25	24	19.5	22	27	21	17	15.5
3	28	[a] 27	0	27	24	27	21	21	28	21	16	16
4	27	[a] 27	0	27	22	25	21	21	27	19.5	16	17
5	27	[a] 27	0	27	22	25	24	21	27	18.5	16	16
6	27	[a] 27	0	28	22	25	22	21	24	24	16	15
7	25	[a] 27	2.2	28	24	25	24	21	22	24	17	14.5
8	27	[a] 25	21	28	25	25	27	19.5	22	22	17	14.5
9	25	[a] 25	24	27	24	25	25	21	22	21	16	14.5
10	24	[b] 27	24	27	25	24	25	22	24	18.5	21	15
11	25	28	27	27	28	24	27	21	25	18	19.5	14.5
12	25	29	25	27	27	24	27	19.5	24	18	22	16
13	27	28	25	27	20	22	28	19.5	22	18	18	15
14	25	28	25	27	27	20	28	22	21	17.5	22	14.5
15	22	28	27	25	28	22	27	21	19.5	17.5	18	16
16	22	28	27	27	27	27	27	25	19.5	19.5	18	18.5
17	21	28	28	27	27	27	25	24	19.5	21	17	28
18	21	28	27	25	28	28	24	22	21	18.5	17.5	21
19	24	27	27	25	29	27	24	24	22	21	17	17.5
20	27	27	27	25	29	27	22	24	22	22	16	15.5
21	27	28	24	24	29	27	22	22	24	18.5	15	15
22	27	28	27	25	25	25	22	25	21	17.5	14.5	17.5
23	27	27	27	27	15	27	22	25	19.5	17.5	14.5	24
24	27	18.5	27	27	23	27	22	27	21	17	15.5	21
25	25	27	27	28	27	19	21	28	21	18	14.5	19.5
26	25	27	27	27	27	22	22	27	21	17	14.5	24
27	24	27	27	27	27	24	21	28	22	17	14.5	24
28	22	27	27	24	25	14.5	21	27	19.5	17	14.5	22
29	22	28	27	25	25	20	21	-------	19.5	17	14	21
30	[b] 23	28	28	27	25	17	21	-------	21	17	13	21
31	[a] 26	28	-------	27	-------	13	22	-------	22	-------	15	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	28	21	25.1	38.8	779	2,390
August	29	18.5	27.1	41.9	840	2,580
September 1–2, 7–30	28	2.2	24.4	37.8	635	1,950
October	28	24	26.6	41.2	824	2,530
November	29	15	25.2	39.0	756	2,320
December	28	13	23.6	36.5	732	2,250
January	28	13	23.1	35.7	718	2,200
February	28	19.5	23.0	35.6	644	1,980
March	28	19.5	22.4	34.7	695	2,130
April	24	17	19.1	29.6	574	1,760
May	22	13	16.6	25.7	514	1,580
June	28	14.5	18.0	27.9	539	1,660
The year (361 days)	29	2.2	22.9	35.4	8,250	25,300

[a] Estimated.
[b] Partly estimated.

NOTE.—No flow Sept. 3–6, owing to artificial regulation.

GEE DITCH AT MAKAI SIPHON NEAR ELEELE, KAUAI

LOCATION.—Water-stage recorder 200 feet below right end of makai siphon bridge 2½ miles northeast of Eleele.

RECORDS AVAILABLE.—December, 1929, to June, 1931.

EXTREMES.—Maximum discharge during year, 2.8 million gallons a day or 4.3 second-feet Nov. 11 (gage height, 2.03 feet); minimum, 0.05 million gallons a day or 0.08 second-foot Mar. 29.

1929–1931: Maximum discharge, that of Nov. 11, 1930; minimum, that of Mar. 29, 1931.

REMARKS.—Records fair. Intake is 700 feet above station and diverts water from Hanapepe River.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.2	0.4	1.2	1.0	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4
2	1.9	.6	1.2	.6	.4	.4	.4	.4	.6	.4	.3	.4
3	1.8	.6	1.3	.6	.4	.5	.3	.4	.8	.4	.3	.4
4	1.5	.4	1.1	.5	.4	.4	.3	.4	.6	.4	.3	.3
5	1.3	.4	.9	.8	.4	.4	.4	.4	.5	.4	.3	.3
6	1.1	.8	.8	1.0	.4	.4	.3	.3	.4	.4	.3	.4
7	1.0	.5	.7	.9	.5	.5	.5	.3	.4	.5	.3	.4
8	1.2	.4	.6	.6	.6	.5	.8	.3	.4	.5	.4	.4
9	1.0	.4	.5	.6	.6	.5	.5	.3	.4	.4	.4	.4
10	1.0	.7	.5	.6	.7	.5	.4	.3	.4	.3	.5	.4
11	1.1	1.3	1.0	.6	1.6	.4	.4	.3	.5	.3	.5	.4
12	1.1	1.3	.6	.6	1.3	.4	.5	.3	.5	.3	.6	.4
13	1.4	.8	.5	.5	1.0	.4	.8	.3	.4	.3	.4	.3
14	1.1	.7	.5	.4	.7	.5	.6	.5	.4	.3	.5	.2
15	1.0	.8	.8	.4	.6	.5	.5	.4	.4	.3	.5	.3
16	.9	.6	.9	.4	.5	.7	.4	.6	.4	.4	.5	.6
17	.6	.9	.8	.4	.6	.7	.4	.5	.4	.4	.4	.7
18	.6	.8	.7	.5	1.1	.7	.4	.4	.4	.3	.5	.5
19	.7	.9	.5	.5	1.7	.6	.3	.4	.4	.5	.5	.4
20	.9	.8	.8	.5	1.0	.5	.3	.4	.5	.5	.4	.4
21	.7	.7	.7	.5	.8	.6	.3	.4	.6	.3	.4	.5
22	.8	.8	.8	.5	.7	.5	.3	.5	.5	.3	.4	.5
23	.7	.6	.8	.6	.7	.5	.3	.5	.4	.3	.4	.6
24	.6	.6	.6	.6	.6	.5	.3	.7	.5	.3	.4	.5
25	.5	.8	.5	.6	.5	.6	.3	.7	.5	.4	.4	.5
26	.5	.8	.5	.5	.6	.5	.4	.5	.5	.3	.4	.6
27	.5	.8	.6	.5	.5	.5	.4	.7	.5	.3	.4	.6
28	.5	.6	.6	.5	.4	.5	.4	.6	.2	.3	.4	.7
29	.5	.8	.6	.5	.4	.5	.4	-------	.3	.3	.4	.5
30	.6	.8	1.0	.6	.4	.4	.4	-------	.5	.3	.5	.5
31	.7	.9	-------	.5	-------	.4	.4	-------	.6	-------	.5	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	1.9	0.5	0.94	1.45	29.0	89
August	1.3	.4	.72	1.11	22.3	68
September	1.3	.5	.75	1.16	22.6	69
October	1.0	.4	.58	.90	17.9	55
November	1.7	.4	.68	1.05	20.5	63
December	.7	.4	.50	.77	15.4	48
January	.8	.3	.41	.63	12.8	39
February	.7	.3	.44	.68	12.2	38
March	.8	.2	.46	.71	14.4	44
April	.5	.3	.36	.56	10.8	33
May	.6	.3	.42	.65	12.9	40
June	.7	.2	.45	.70	13.5	41
The year	1.9	.2	.56	.87	204	627

SOUTH FORK OF WAILUA RIVER NEAR LIHUE, KAUAI

LOCATION.—Water-stage recorder one-third of a mile above Wailua Falls and 5 miles northeast of Lihue. Prior to Nov. 18, 1918, station was one-third of a mile further upstream.

DRAINAGE AREA.—22.4 square miles.

RECORDS AVAILABLE.—December, 1911, to June, 1931.

EXTREMES.—Maximum discharge during year, 3,670 million gallons a day or 5,680 second-feet July 31 (gage height, 6.04 feet); minimum, 1.4 million gallons a day or 2.2 second-feet June 14.

1911–1931: Maximum discharge, 29,000 million gallons a day or 44,900 second-feet Jan. 16, 1920 (gage height, 11.25 feet); minimum, 1.2 million gallons a day or 1.9 second-feet May 3, 1926.

REMARKS.—Records good except those for extremely high stages, which are poor. Lihue Ditch and Hanamaulu Ditch divert water above station at elevations of 600 feet and 500 feet, respectively, for irrigation.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	14.5	507	413	529	39	53	25	4.7	3.3	2.9	2.0	2.3
2	130	97	598	156	36	57	8.8	4.4	17	2.8	2.0	2.2
3	176	132	335	146	29	77	5.7	4.3	21	2.5	2.0	2.1
4	103	45	234	136	9.2	59	5.3	4.3	11	2.3	1.9	2.0
5	50	26	146	301	6.7	56	4.8	4.0	3.8	2.2	1.7	2.0
6	28	102	174	804	6.5	47	4.6	3.9	2.9	2.4	1.8	1.9
7	25	27	188	242	6.5	42	18	3.8	2.3	2.9	2.0	1.9
8	18	40	99	156	9.4	43	98	3.7	2.2	2.8	2.2	1.9
9	11	27	48	146	38	44	9.2	4.0	2.4	2.7	2.2	1.8
10	6.1	54	24	152	84	42	5.9	4.1	4.4	2.3	2.8	1.8
11	5.3	222	235	126	422	41	5.9	4.0	12	2.1	3.4	1.8
12	5.4	284	59	108	301	39	18.5	3.8	7.4	2.0	3.9	1.9
13	32	77	48	97	105	30	108	3.7	4.0	2.0	3.7	1.8
14	27	36	59	86	60	22	74	4.1	3.6	2.0	3.6	1.5
15	6.6	81	99	81	60	33	22	3.7	3.2	2.0	3.0	1.5
16	5.6	12.5	277	103	68	68	13	3.7	3.0	2.2	2.8	2.3
17	5.1	70	247	76	89	76	6.8	3.5	2.9	2.1	2.8	20
18	4.7	60	172	63	458	92	5.6	3.1	2.8	2.3	3.0	3.4
19	4.5	107	92	47	976	58	5.6	3.6	2.9	2.8	2.8	2.3
20	8.6	62	102	11	178	50	5.1	3.5	3.1	5.7	3.1	2.0
21	5.4	54	126	12	219	51	4.8	3.1	3.8	3.1	2.4	1.8
22	15.5	123	166	17	136	44	4.3	3.2	3.3	2.6	2.0	2.0
23	7.8	43	118	25	116	39	4.1	3.4	2.8	2.3	2.0	2.2
24	7.0	49	52	27	97	42	4.1	4.8	2.8	2.3	2.4	2.2
25	6.3	156	26	54	86	48	4.0	5.9	2.7	2.3	2.2	2.3
26	5.6	83	37	33	84	44	4.1	3.8	2.5	2.3	2.0	2.5
27	5.3	50	73	12.5	70	43	4.1	3.2	2.6	2.2	2.2	2.6
28	5.1	44	92	12.5	46	37	4.0	3.2	2.5	2.1	2.4	2.7
29	5.2	110	69	42	52	46	4.0	-------	2.4	2.0	3.8	2.7
30	14	339	496	119	57	42	3.9	-------	4.1	2.0	3.1	2.7
31	209	296	-------	45	-------	30	4.4	-------	3.7	-------	2.5	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	209	4.5	30.7	47.5	953	2,920
August	507	12.5	110	170	3,420	10,500
September	598	24	163	252	4,900	15,000
October	804	11	128	198	3,960	12,200
November	976	6.5	131	203	3,940	12,100
December	92	22	48.2	74.6	1,500	4,590
January	108	3.9	16.0	24.8	496	1,520
February	5.9	3.1	3.88	6.00	108	333
March	21	2.2	4.79	7.41	148	456
April	5.7	2.0	2.47	3.82	74.2	227
May	3.9	1.7	2.57	3.98	79.7	244
June	20	1.5	2.74	4.24	82.1	252
The year	976	1.5	53.9	83.4	19,700	60,300

NORTH FORK OF WAILUA RIVER AT ELEVATION 650 FEET, NEAR LIHUE, KAUAI

LOCATION.—Water-stage recorder 1½ miles above intake of Kanaha Ditch and 7¾ miles northwest of Lihue.

DRAINAGE AREA.—6.6 square miles.

RECORDS AVAILABLE.—August, 1910, to June, 1931.

EXTREMES.—Maximum discharge during year, 1,520 million gallons a day or 2,350 second-feet Nov. 18 (gage height, 6.03 feet); minimum, 10 million gallons a day or 15.5 second-feet May 9.

1910–1931: Maximum discharge, 3,410 million gallons a day or 5,280 second-feet Dec. 24, 1927 (gage height, 8.46 feet); minimum, about 7.7 million gallons a day or 11.9 second-feet Apr. 27, 1926.

REMARKS.—Records good for ordinary stages, fair for estimated periods, and poor for high stages. Hanalei tunnel discharges water into stream, and the North Wailua Ditch diverts water from stream above station for irrigation.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	51	156	106	76	32	[a] 28	21	26	22	17.5	15	13
2	142	85	185	51	29	51	20	21	89	37	15	13
3	124	67	156	62	[a] 27	42	20	19	57	20	15	12
4	85	46	114	49	27	36	22	21	33	17.5	15	12.5
5	67	41	90	113	28	32	35	20	32	19	14	12
6	50	119	73	246	28	28	22	18.5	25	27	13.5	12
7	45	46	61	88	32	28	64	18	24	34	14.5	12
8	52	34	49	63	29	31	73	18	22	22	14	14.5
9	37	32	43	56	32	26	34	20	25	18.5	12	14.5
10	34	102	63	65	69	25	28	23	46	17.5	18.5	14.5
11	44	159	133	49	196	29	34	18	42	16.5	16.5	14
12	44	158	52	40	224	26	40	17	27	16	32	15
13	58	76	43	37	85	24	60	17	23	17	17	14.5
14	34	63	52	32	59	25	52	33	22	16	22	14
15	30	67	97	29	56	23	32	19	21	16	20	16
16	35	54	223	44	52	51	27	37	20	20	33	34
17	30	88	139	32	71	39	28	22	19.5	19	18.5	42
18	30	67	77	29	236	41	27	21	19	16.5	24	16.5
19	40	92	109	28	315	28	24	22	22	36	22	15
20	57	63	86	27	130	26	23	20	27	90	23	14.5
21	40	76	115	26	119	29	22	19	36	27	21	14.5
22	52	84	74	27	85	27	21	23	20	22	15.5	19.5
23	50	52	76	36	67	26	21	23	21	20	13.5	26
24	40	43	49	41	59	27	20	31	23	19	21	18.5
25	32	115	43	37	52	28	20	37	19	19	13.5	21
26	39	68	40	28	[a] 46	26	20	22	21	18.5	13	25
27	37	70	49	32		23	19.5	45	21	17.5	14.5	24
28	30	52	56	32		22	19	35	17.5	17	16.5	36
29	30	99	49	72	34	34	19	-------	17	15.5	16	19
30	49	97	200	62		22	18.5	-------	25	15	14.5	25
31	150	139	-------	37	-------	21	25	-------	21	-------	14	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	150	30	52.8	81.7	1,640	5,020
August	159	32	81.0	125	2,510	7,710
September	223	40	90.1	139	2,700	8,300
October	246	26	53.1	82.2	1,650	5,050
November	315	27	77.4	120	2,320	7,130
December	51	21	29.8	46.1	924	2,840
January	73	18.5	29.4	45.5	911	2,800
February	45	17	23.8	36.8	666	2,050
March	89	17	27.7	42.9	859	2,640
April	90	15	22.8	35.3	684	2,100
May	33	12	17.7	27.4	548	1,680
June	42	12	18.5	28.6	554	1,700
The year	315	12	43.7	67.6	16,000	49,000

[a] Partly estimated.

KANAHA DITCH NEAR LIHUE, KAUAI

LOCATION.—Water-stage recorder a quarter of a mile above point where Kauai Electric Co.'s power line crosses ditch and 7¾ miles northwest of Lihue.

RECORDS AVAILABLE.—August, 1910, to June, 1931.

EXTREMES.—See monthly-discharge table for maximum and minimum daily discharge.

1910–1931: Maximum discharge recorded, 45 million gallons a day or 70 second-feet Dec. 24, 1927 (gage height, 3.22 feet); no flow occasionally when water was shut out of ditch.

REMARKS.—Daily-discharge record furnished by Lihue Plantation Co. Intake 8½ miles above mouth of river at elevation of about 600 feet. Water used for irrigation of sugarcane. Regulated by head gates and spillways.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	5.3	5.4	5.0	0.4	5.4	1.3	1.0	6.0	6.6	11.1	11.8	10.3
2	5.3	5.5	4.5	.5	5.3	1.3	1.9	6.0	6.6	10.4	12.0	9.7
3	5.2	5.3	4.7	.6	5.3	.8	4.8	6.1	6.5	8.0	12.0	9.9
4	5.1	5.3	5.2	.5	5.1	.7	5.3	6.2	6.6	8.2	11.9	10.1
5	5.2	5.2	5.3	.7	5.0	.6	5.3	6.1	6.6	8.4	11.5	9.9
6	5.4	5.5	5.3	.9	5.0	.6	5.7	6.3	6.6	8.7	10.8	7.0
7	5.6	5.3	5.3	.5	5.0	.8	7.4	6.6	6.6	5.9	11.8	2.7
8	5.6	5.4	5.2	.5	5.2	1.1	7.4	6.6	6.6	5.0	11.0	6.1
9	5.3	5.4	5.2	.5	5.1	1.0	7.1	6.6	6.6	5.2	9.5	6.0
10	5.4	6.0	5.1	.5	5.6	.7	1.3	6.6	6.5	5.3	10.1	6.0
11	5.3	5.7	5.1	.7	3.2	1.1	7.2	6.1	6.2	5.3	6.0	5.9
12	5.2	5.4	5.1	1.0	1.1	1.2	7.4	6.3	6.5	5.3	6.5	5.8
13	5.3	5.4	5.0	.6	.7	1.1	4.7	6.6	6.6	5.3	7.4	5.8
14	5.3	5.5	5.1	.4	.9	1.0	.7	6.6	6.6	5.3	5.4	5.8
15	5.3	5.5	5.3	.4	.7	.7	1.9	6.5	6.6	5.3	5.2	6.1
16	5.3	5.3	5.4	.4	.7	1.0	5.3	6.7	6.6	7.2	5.3	6.1
17	5.2	5.5	5.1	.5	.9	1.3	5.3	7.3	6.6	13.0	5.4	6.9
18	5.3	5.3	5.0	.6	1.1	1.2	5.3	12.3	6.6	12.3	5.3	8.4
19	5.7	5.5	4.8	1.0	.7	.9	5.3	13.2	6.7	13.1	5.1	8.4
20	5.6	5.3	5.1	4.2	.5	.9	5.6	13.3	6.6	12.0	5.2	9.0
21	5.4	5.3	5.3	5.5	.7	1.2	6.6	13.1	6.4	8.0	5.1	10.3
22	5.4	5.4	5.5	5.3	.8	1.1	6.6	14.1	6.4	8.2	10.4	10.4
23	5.5	5.3	5.4	5.4	.7	.9	6.5	14.1	6.6	8.2	11.5	10.3
24	5.4	5.3	5.3	5.5	.7	.9	6.4	8.5	6.5	9.7	13.5	10.2
25	5.4	5.5	5.3	5.4	.5	.7	6.1	6.8	6.6	13.4	11.3	10.3
26	5.3	5.3	5.3	5.3	.5	.5	6.4	6.9	6.6	13.2	10.5	9.9
27	5.3	5.3	5.0	5.4	.6	.6	6.4	6.8	6.6	13.0	11.2	10.4
28	5.3	5.1	4.9	5.2	.5	.8	6.4	6.6	8.0	12.5	11.1	10.4
29	5.3	5.2	4.6	5.2	.6	1.0	6.4	-------	11.8	12.1	12.1	11.2
30	5.4	4.9	3.3	5.1	.9	.8	6.6	-------	10.9	11.7	11.9	14.2
31	5.4	5.3	-------	5.2	-------	1.0	6.4	-------	10.3	-------	11.4	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	5.7	5.1	5.35	8.28	166	509
August	6.0	4.9	5.37	8.31	167	511
September	5.5	3.3	5.06	7.83	152	466
October	5.5	.4	2.38	3.68	73.9	226
November	5.6	.5	2.30	3.56	69.0	212
December	1.3	.5	.93	1.44	28.8	88
January	7.4	.7	5.38	8.32	167	512
February	14.1	6.0	8.03	12.4	225	690
March	11.8	6.2	7.04	10.9	218	670
April	13.4	5.0	9.01	13.9	270	830
May	13.5	5.1	9.33	14.4	289	888
June	14.2	2.7	8.45	13.1	254	778
The year	14.2	.4	5.70	8.82	2,080	6,380

EAST BRANCH OF NORTH FORK OF WAILUA RIVER NEAR LIHUE, KAUAI

LOCATION.—Water-stage recorder 1,200 feet above confluence with North Fork and 7½ miles northwest of Lihue.

DRAINAGE AREA.—6.2 square miles.

RECORDS AVAILABLE.—July, 1912, to June, 1931.

EXTREMES.—Maximum discharge during year, 1,870 million gallons a day or 2,890 second-feet Nov. 20 (gage height, 7.58 feet); minimum, 9.6 million gallons a day or 14.9 second-feet June 21.

1912–1931: Maximum discharge, 3,340 million gallons a day or 5,170 second-feet Dec. 24, 1927 (gage height, 10.57 feet); minimum, 4.4 million gallons a day or 6.8 second-feet July 8, 13, 1926.

REMARKS.—Records good for ordinary stages; fair for high and low stages and estimated periods. No diversions above station.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	33	70		93	21	22	14.5	15.5	18.5	14	11.5	12
2	95	48	95	40	21	41	14	15	42	15	11.5	11.5
3	78	42		38	19	35	14	14	30	14	11.5	11.5
4	54	33		35	17.5	26	14	15	21	13	11	11
5	45	30		69	22	22	15	14	21	13	11	11
6	38	33		216	19	22	14	13	17	16	11	10.5
7	33	30	38	52	29	21	32	13	16	19	11.5	10.5
8	38	[a] 26		42	26	21	34	12.5	15	15	11.5	10.5
9	30	[a] 25		40	21	19	21	13.5	17	13.5	11	10.5
10	30	31		41	32	19	19	16	28	13	15	10.5
11	33	45	80	33	59	21	24	14	30	12.5	14	10
12	31	40		28	68	19	24	13	22	12	18	10.5
13	43	33	42	26	35	17.5	35	12.5	17.5	12.5	12.5	10.5
14	30	30		24	26	17.5	33	16.5	17	12	15	10
15	28	33		24	24	17.5	22	14	16	12	13.5	11
16	26	30	100	26	24	17.5	19	17	15.5	14	14	16.5
17	25	31		22	31	21	17.5	15	15	13.5	12	21
18	25	35		22	200	26	17	14	15	12.5	15	12
19	26	38		21	239	19	16	15	15	36	14	10.5
20	30	33	55	21	147	17.5	16	14	16	53	17	10
21	25	31		19	93	17.5	15.5	14	16	16.5	17	10
22	30	33		19	52	17	15	14.5	15.5	14	13.5	10.5
23	34	30	40	22	42	17	15	16	14	13	13	13
24	31	28		22	37	19	14	19.5	14.5	14	16	13
25	26	36	[a] 33	22	33	19	14.5	19	14	13.5	13	13
26	25	31	33	19	30	17.5	14.5	15.5	14	12.5	13	19
27	25	33	35	19	28	16	14	21	15	12	14	21
28	24	30	33	21	26	15.5	14	17	14	11.5	14	25
29	24	[a] 30	30	49	24	21	14	-------	13.5	11.5	18	14.5
30	48	80	121	40	24	15.5	13.5	-------	14	11.5	13	15
31	63		------	24	-------	15	16	-------	16.5	-------	12.5	------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	95	24	36.3	56.2	1,130	3,450
August	----------	25	37.4	57.9	1,160	3,560
September	----------	----------	59.4	91.9	1,780	5,470
October	216	19	38.4	59.4	1,190	3,650
November	239	17.5	49.0	75.8	1,470	4,510
December	41	15	20.4	31.6	632	1,940
January	35	13.5	18.5	28.6	575	1,760
February	21	12.5	15.1	23.4	423	1,300
March	42	13.5	18.2	28.2	566	1,730
April	53	11.5	15.5	24.0	466	1,430
May	18	11	13.5	20.9	418	1,280
June	25	10	12.8	19.8	386	1,180
The year	239	10	27.9	43.2	10,200	31,300

[a] Partly estimated.

KAPAHI DITCH NEAR KEALIA, KAUAI

LOCATION.—Water-stage recorder 500 feet below intake and 4½ miles west of Kealia.

RECORDS AVAILABLE.—April, 1909, to May, 1914; May, 1915, to June, 1931.

EXTREMES.—Maximum discharge during year, 173 million gallons a day or 268 second-feet Sept. 19 (gage height, 2.60 feet); no flow occasionally when water was shut out of ditch.

1909–1914; 1915–1931: Maximum discharge, 233 million gallons a day or 361 second-feet Mar. 31, 1923 (gage height, about 3.15 feet); no flow occasionally when water was shut out of ditch.

REMARKS.—Records good except those for extremely low stages, which are poor. Diverts water from Kapaa River at elevation of about 400 feet. Water used for irrigation. Regulated by head gates.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	9.3	12	0	0.55	5.1	0	0.7	2.4	1.4	2.7	2.9	0.7
2	13.5	10	.3	.55	.3	0	3.9	4.9	3.4	2.7	3.2	.7
3	4.6	5.2		.7	7.1	0	3.5	3.7	.9	.55	2.1	2.2
4	.3	8.0		1.1	6.5	0	.9	4.6	.7	2.4	3.7	2.7
5	14	6.5		1.3	4.7	0	5.5	3.7	.55	1.3	3.7	2.1
6	3.6	9.5		1.5	.4	0	5.9	3.2	.7	5.2	4.0	2.6
7	9.8	6.2	0	.9	.4	0	11.5	2.9	.55	8.2	4.3	2.1
8	12.5	6.8		1.3	.55	[a] 6.2	10.5	2.1	3.7	4.0	4.3	2.9
9	7.2	6.2		1.5	.55	[b] 8.7	6.1	4.0	5.5	2.9	4.6	2.6
10	7.6	4.8		1.1	.7	[a] 9.0	3.6	6.4	9.9	2.9	6.4	2.4
11	13.5	14		.55	.55	12.5	.4	2.9	9.8	10	5.5	2.4
12	9.1	13	[a] 5.1	.3	.55	10.5	3.4	2.9	9.9	1.9	12	2.8
13	1.5	10	5.5	.3	.55	6.6	.4	3.2	6.4	3.4	3.4	2.4
14	12	7.6	4.9	1.2	.55	.15	1.5	7.1	5.0	3.2	8.2	1.5
15	11.5	9.4	6.0	7.5	.55	5.0	.9	2.1	.7	2.9	4.0	3.3
16	11	8.0	10	9.0	6.8	4.4	2.3	5.0	5.7	4.5	4.5	10.5
17	7.6	9.5	12	7.6	12.5	3.8	1.6	2.9	5.9	3.4	3.2	9.1
18	5.9	16	16.5	6.8	8.6	2.7	.3	2.1	3.2	4.0	8.3	2.6
19	7.3	14.5	15.5	4.6	.9	1.9	.55	2.4	4.0	3.3	5.5	2.4
20	2.7	12.5	1.8	4.9	.4	2.1	1.4	1.7	6.5	2.9	5.2	1.3
21	8.6	10	1.1	4.6	.09	.55	4.9	.55	4.9	5.4	8.9	1.3
22	10.5	10.5	.9	4.9	0	5.9	4.0	.6	2.4	4.8	5.5	3.0
23	12.5	7.2	3.8	8.0	0	8.0	3.7	5.3	4.3	4.3	4.0	5.5
24	10.5	3.4	3.0	8.7	0	8.8	3.4	6.1	4.3	4.0	4.0	3.2
25	4.8	13.5	.4	4.4	0	4.2	2.4	4.3	3.2	2.7	4.4	4.9
26	4.8	8.3	.4	.15	0	8.2	3.4	4.3	2.7	.4	4.1	11
27	4.0	8.1	2.9	4.2	0	4.8	3.7	4.3	3.8	2.0	4.1	11
28	5.5	6.2	.4	8.4	0	.7	3.4	5.2	2.8	2.1	5.5	3.1
29	1.7	28	10.5	7.8	0	3.9	3.2	-------	1.1	1.3	1.7	3.2
30	15	47	9.9	.15	0	1.1	2.9	-------	3.3	1.0	.55	4.1
31	6.5	3.6	-------	10.5	-------	2.6	3.3	-------	6.3	-------	.7	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	15	0.3	8.03	12.4	249	764
August	47	3.4	10.8	16.7	336	1,030
September 2, 12–30	16.5	.3	5.54	8.57	111	340
October	10.5	.15	3.71	5.74	115	353
November 1–21	12.5	.09	2.78	4.30	58.3	179
December 8–31	12.5	.15	5.10	7.89	122	376
January	11.5	.3	3.33	5.15	103	317
February	7.1	.55	3.60	5.57	101	309
March	9.9	.55	3.98	6.16	124	379
April	10	.4	3.34	5.17	100	308
May	12	.55	4.60	7.12	142	438
June	11	.7	3.65	5.65	110	336
The year (339 days)	47	.09	4.93	7.63	1,670	5,130

[a] Partly estimated. [b] Estimated.

ANAHOLA RIVER NEAR KEALIA, KAUAI

LOCATION.—Water-stage recorder a quarter of a mile above dam at Kiokala and 4½ miles northwest of Kealia.

DRAINAGE AREA.—5.5 square miles.

RECORDS AVAILABLE.—August to November, 1910; December, 1912, to June, 1931.

EXTREMES.—Maximum discharge during year, 970 million gallons a day or 1,500 second-feet Sept. 19 (gage height, 7.48 feet); minimum, 3.7 million gallons a day or 5.7 second-feet Feb. 7, 12, 13.

1910, 1912–1931: Maximum discharge, 1,820 million gallons a day or 2,820 second-feet Jan. 25, 1930 (gage height, 10.32 feet); minimum, 1.4 million gallons a day or 2.2 second-feet Sept. 12–13, 1923.

REMARKS.—Records good for ordinary stages except those estimated, which are poor. Records poor for high stages. Anahola Ditch diverts water 3 miles above station for irrigation and domestic supply.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	17	20	29	[a]100	6.3	7.9	4.7	4.5	68	7.4	[b]4.4	6.1
2	80	21	82		6.1	137	4.7	5.6	24	6.6	[b]4.5	5.7
3	28	11	13	9	5.7	50	4.7	4.1	10.5	6.1	4.6	5.4
4	21	5.9	8.3		5.6	18	4.6	4.4	6.6	5.7	4.5	5.2
5	21	5.7	6.3		5.7	14	4.6	4.0	7.5	5.7	4.4	5.1
6	10.5	11	6.1	60	8.1	11.5	4.6	3.9	5.6	5.7	4.4	5.0
7	7.4	5.1	33		17	11	7.6	3.8	5.0	8.3	4.5	4.8
8	8.6	4.7	9.6	19.5	20	11.5	17	3.8	4.7	6.6	4.4	4.7
9	6.3	4.6	6.3	18	18.5	9.2	8.4	3.9	6.7	5.4	4.8	4.6
10	5.7	13.5	5.7	15	18.5	9.0	5.1	4.4	50	5.1	8.9	4.6
11	7.2	23	13.5	11	41	14	8.4	4.1	22	5.0	5.8	4.6
12	10	9.0	5.6	9.2	53	8.5	13.5	3.8	11.5	5.0	8.6	4.6
13	14.5	6.8	5.1	8.5	13.5	7.7	14.5	3.8	8.3	5.2	4.8	4.4
14	6.1	5.9	5.0	8.1	9.5	7.7	15.5	4.6	7.0	4.8	4.8	4.4
15	5.6	6.8	5.6	7.7	8.1	7.2	6.5	4.2	6.5	4.8	4.7	4.6
16	6.1	5.6	11.5	7.7	7.4	6.3	5.6	5.0	6.0	5.0	4.5	6.6
17	5.4	5.7	10.5	7.0	12	11	5.1	4.5	5.7	5.1	4.4	8.0
18	5.1	16.5	33	7.2	101	13	5.2	5.1	5.7	6.4	6.1	5.0
19	5.4	10.5	87	7.0	105	6.6	4.7	5.1	9.2	61	17	4.5
20	6.8	6.1	18	6.6	68	6.1	4.6	4.4	16.5	46	17.5	4.4
21	5.0	5.9	40	6.3	38	6.1	4.6	4.0	12	7.4	12	4.2
22	5.4	7.8		6.3	44	5.7	4.5	4.2	8.3	6.1	6.8	4.6
23	7.9	5.0		6.3	21	5.7	4.5	5.1	7.0	5.9	8.8	5.0
24	7.0	4.7		7.3	16.5	6.5	4.4	5.6	6.6	5.7	15.5	4.7
25	4.7	6.0		7.9	15	7.8	4.4	4.8	6.5	6.3	7.0	4.6
26	5.1	5.0	8.5	5.6	41	6.6	4.2	4.2	6.3	5.9	15.5	11
27	4.7	5.0		5.4	15	5.7	4.1	4.6	6.3	5.0	11	10
28	4.4	4.8		6.5	11	5.4	4.1	4.4	5.9	4.8	10.5	15
29	4.5	15		65	9.2	5.2	4.0	-------	5.9	4.7	9.0	5.7
30	9.6	56	[a]90	17.5	8.5	5.0	4.0	-------	31	4.7	7.0	5.0
31	35	28	-------	7.4	-------	4.8	4.6	-------	22	-------	6.5	------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	80	4.4	12.0	18.6	371	1,140
August	56	4.6	11.0	17.0	342	1,050
September	----------	----------	20.8	32.2	624	1,910
October	----------	5.4	18.7	28.9	581	1,780
November	105	5.6	25.0	38.7	749	2,300
December	137	4.8	13.9	21.5	432	1,320
January	17	4.0	6.35	9.82	197	604
February	5.6	3.8	4.42	6.84	124	380
March	68	4.7	13.1	20.3	405	1,250
April	61	4.7	8.91	13.8	267	820
May	17.5	4.4	7.65	11.8	237	728
June	15	4.2	5.74	8.88	172	528
The year	137	3.8	12.3	19.0	4,500	13,800

[a] Estimated. [b] Partly estimated.

ANAHOLA DITCH ABOVE KANEHA RESERVOIR, NEAR KEALIA, KAUAI

LOCATION.—Water-stage recorder at upper end of second tunnel above Kaneha Reservoir, 5 miles northwest of Kealia.

RECORDS AVAILABLE.—May, 1915, to June, 1931.

EXTREMES.—Maximum discharge during year, 84 million gallons a day or 130 second-feet Mar. 1 (gage height, 4.85 feet); no flow occasionally when water is shut out of ditch.

1915–1931: Maximum discharge recorded, 130 million gallons a day or 201 second-feet Jan. 16, 1921 (gage height, 6.25 feet); no flow occasionally when water is shut out of ditch.

REMARKS.—Records good. This station measures water diverted from Anahola River to Kaneha Reservoir, where it is stored for irrigation. Regulated by head gates and spillways.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	4.6	5.9	6.5	0	3.6	0	1.8	2.7	10.5	3.2	1.4	2.2
2	7.6	5.8	3.2	0	3.3	0	1.7	3.6	12	2.6	1.3	2.0
3	6.2	5.5	0	0	2.9	0	1.7	1.8	.9	2.1	1.4	1.8
4	6.1	4.8	2.2	0	2.6	0	1.7	2.4	4.5	1.9	1.4	1.8
5	6.1	4.9	5.5	0	2.8	0	1.8	1.7	8.1	1.9	1.2	1.6
6	5.7	5.4	5.1	0	3.3	0	1.7	1.4	3.6	2.1	1.2	1.5
7	5.3	4.1	2.9	0	3.3	0	2.3	1.3	3.0	6.5	1.5	1.4
8	5.5	3.2	1.7	0	3.7	0	2.8	1.3	2.6	3.5	1.8	1.4
9	4.6	2.8	4.6	0	3.6	0	2.6	1.5	5.4	2.1	3.2	1.3
10	4.2	4.6	4.6	0	3.8	0	2.4	4.3	11	1.8	10	1.2
11	5.1	6.1	5.8	0	4.9	0	2.6	1.8	11	1.5	4.2	1.2
12	5.5	5.5	4.4	0	1.1	0	5.9	1.3	6.2	1.5	7.0	1.4
13	5.8	5.3	3.8	0	0	0	11.5	1.2	4.2	2.2	2.3	1.2
14	4.4	5.1	3.7	0	0	0	11	4.2	3.7	1.5	4.3	1.1
15	3.4	5.4	4.9	0	0	0	5.3	1.8	3.0	1.4	2.8	1.4
16	4.0	4.8	5.0	0	0	.8	3.9	5.4	2.4	2.8	3.1	5.9
17	2.9	4.9	6.0	0	0	.8	3.6	2.4	2.2	1.8	2.0	6.3
18	2.4	6.0	6.8	[a] .7	0	0	3.8	5.4	2.0	1.9	5.3	1.9
19	2.9	5.7	4.0	[a] 1.6	0	1.6	2.5	5.0	4.1	8.1	5.6	1.4
20	4.2	5.3	0	[a] 1.6	0	2.2	2.3	2.3	7.1	11	8.8	1.2
21	3.0	5.3	0	1.7	0	2.1	2.2	2.1	6.4	4.2	6.0	1.1
22	4.0	5.5	3.2	1.9	0	2.1	2.0	3.8	5.6	2.9	2.9	1.6
23	4.5	4.5	2.2	2.3	0	2.2	1.8	4.7	2.7	2.6	3.2	4.6
24	4.8	3.7	.1	2.9	0	2.2	1.8	5.2	2.5	2.6	6.9	2.8
25	3.0	5.1	2.0	2.9	0	2.4	1.8	3.4	2.3	3.0	2.8	2.9
26	3.9	4.6	3.9	2.0	0	2.2	1.8	2.2	2.4	2.6	5.6	8.1
27	3.6	5.0	1.4	2.3	0	2.1	1.7	5.2	2.6	1.8	4.6	9.5
28	2.6	4.4	0	3.0	0	2.0	1.7	5.0	1.9	1.6	5.6	7.9
29	3.3	4.0	0	5.7	0	2.0	1.6	-------	1.8	1.5	5.8	3.4
30	4.9	6.5	0	4.4	0	1.9	1.5	-------	6.8	1.4	2.9	3.1
31	5.8	7.2	-------	3.8	-------	1.9	3.0	-------	8.2	-------	2.5	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	7.6	2.4	4.51	6.98	140	429
August	7.2	2.8	5.06	7.83	157	481
September 1–2, 9–18, 22–27	6.8	.1	3.90	6.03	93.5	287
October 18–31	5.7	----------	2.63	4.07	36.8	113
November 1–12	4.9	1.1	3.24	5.01	38.9	119
December 16–17, 19–31	2.4	.8	1.90	2.94	28.5	87
January	11.5	1.5	3.03	4.69	93.8	288
February	5.4	1.2	3.01	4.66	84.4	259
March	12	.9	4.86	7.52	151	462
April	11	1.4	2.85	4.41	85.6	262
May	10	1.2	3.83	5.93	119	364
June	9.5	1.1	2.81	4.35	84.2	259
The year (308 days)	12	.1	3.61	5.59	1,110	3,410

[a] Partly estimated.

HANALEI RIVER AT ELEVATION 625 FEET, NEAR HANALEI, KAUAI

LOCATION.—Water-stage recorder 2 miles west of Kauai Electric Co.'s power line and about 10 miles above mouth of stream.

DRAINAGE AREA.—7.4 square miles.

RECORDS AVAILABLE.—January, 1914, to June, 1931.

EXTREMES.—Maximum discharge during year, 2,050 million gallons a day or 3,170 second-feet Nov. 20 (gage height, 5.95 feet); minimum, 8.6 million gallons a day or 13.3 second-feet for several days during May and June.

1914–1931: Maximum discharge, 6,500 million gallons a day or 10,100 second-feet Jan. 16, 1921 (gage height, 7.50 feet); minimum, 5.8 million gallons a day or 9.0 second-feet Apr. 28, May 1–3, 1926.

REMARKS.—Records good for ordinary stages except those estimated, which are fair; poor for extremely high and low stages. Hanalei tunnel diverts water from stream about 2 miles above station.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	78	116	71	92	17.5	18.5	15.5	16.5	15.5	11.5	11.5	
2	204	71	252	34	16	77	15.5	14.5	96	32	[a] 11	
3	108	46	116	35	14.5	42	15.5	13.5	36	11.5		
4	56	29	77	54	13.5	30	16	13.5	19	11		
5	46	25	43	94	13.5	23	24	13.5	21	12.5		
6	31	133	36	215	13.5	21	15.5	13.5	15	13.5	12	
7	26	28	36	57	42	21	42	13	13.5	18.5		
8	31	21	27	43	25	21	56	13	13	12.5		9
9	21	19	22	32	18	18	24	13.5	18	11		
10	19.5	79	28	44	42	19	19.5	16	29	11		
11	24	160	110	27	140	25	28	13.5	23	10		
12	35	132	28	22	219	18.5	39	13	15	10	30	
13	38	48	22	20	49	17	54	13	13.5	10.5		
14	20	35	26	18.5	28	17.5	38	20	13.5	10		
15	18	43	66	17	24	16.5	23	13.5	13	10.5		
16	18.5	30	309	18	20	30	19.5	22	12.5	12		
17	16.5	60	126	16	41	30	21	14.5	12.5	11.5		
18	16	49	68	16.5	317	32	21	13.5	12.5	11		
19	22	65	52	15.5	362	19.5	17	14.5	12.5	75		
20	46	42	77	14	205	18.5	16.5	14	14.5	148	13	13
21	22	39	78	13.5	95	25	16	13.5	16.5	19.5		
22	34	49	52	14	56	18.5	15.5	16	12.5	15.5		
23	33	28	53	18.5	42	18.5	15	17	12.5	13.5		
24	24	22	35	22	35	19	15	24	12.5	12.5		
25	18.5	72	30	20	32	19.5	14.5	24	11.5	12.5		
26	22	39	28	14	30	18.5	14.5	17.5	12	12		
27	20	37	35	15	28	17	14	36	12.5	11.5	10	20
28	17	26	30	16.5	22	16.5	13.5	20	11.5	11.5		
29	16.5	74	28	76	20	28	13.5	-------	11.5	11.5		
30	56	71	117	46	19	16	13.5	-------	16.5	11		
31	96	100	-------	21	-------	16	17.5	-------	14	-------		------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	204	16	39.8	61.6	1,230	3,790
August	160	19	57.7	89.3	1,790	5,490
September	309	22	69.3	107	2,080	6,380
October	215	13.5	37.5	58.0	1,160	3,570
November	362	13.5	66.6	103	2,000	6,130
December	77	16	23.5	36.4	728	2,240
January	56	13.5	22.0	34.0	683	2,090
February	36	13	16.4	25.4	460	1,410
March	96	11.5	18.1	28.0	562	1,720
April	148	10	19.5	30.2	584	1,800
May	----------	----------	15.8	24.4	488	1,500
June	----------	----------	12.4	19.2	372	1,140
The year	362	----------	33.3	51.5	12,100	37,300

[a] Partly estimated.

WAIOLI STREAM NEAR HANALEI, KAUAI

LOCATION.—Water-stage recorder 2½ miles south of Hanalei and 3 miles above mouth of stream.

DRAINAGE AREA.—1.6 square miles.

RECORDS AVAILABLE.—July, 1914, to June, 1931.

EXTREMES.—Maximum discharge during year, 599 million gallons a day or 927 second-feet Nov. 18 (gage height, 5.03 feet); minimum, 5.6 million gallons a day or 8.7 second-feet sometime in June.

1914–1931: Maximum discharge, 955 million gallons a day or 1,480 second-feet Dec. 19, 1916 (gage height, 6.15 feet); minimum, 2.0 million gallons a day or 3.1 second-feet July 22, 1914.

REMARKS.—Records good for ordinary stages; poor for extremely high and low stages and estimated periods. No diversions.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	67	78	14	35	9.6	8.5	7.3	10.5	7.8		5.9	
2	64	33	17	13.5	8.3	126	7.2	7.8	23		5.8	
3	26	23	22	12	7.6	36		6.6	24		5.9	
4	22	15.5	15.5	12.5	7.3	16.5		6.8	11.5	9	6.0	
5	20	14	11	13.5	7.2	12.5	8.5	6.5	14		5.9	
6	13.5	27	10.5	33	6.9	11		6.3	8.3		6.2	
7	10	12	9.4	15.5	30	13.5		6.3	7.2		10.5	
8	11.5	10	9.6	14	23	12.5		6.3	7.1		8.5	6
9	8.5	9.2		12.5	14	10		10.5	18		12.5	
10	9.1	35		13.5	9.8	13.5		11.5	22		28	
11	21	47		10	16.5	16.5	17	6.9	15		17	
12	26	58		8.8	47	11.5		6.5	9.2		23	
13	20	19.5	24	8.3	15	9.0		6.2	7.6	6.5	10.5	
14	11	16		8.0	10	8.3		11.5	7.1		21	
15	8.5	19		7.6	10.5	8.0		7.6	6.8		12.5	
16	7.7	15.5		8.0	9.8	14.5		13	6.5		7.8	
17	7.3	19		7.6	26	30		7.6	6.2		6.9	
18	7.7	27	13.5	7.6	138	21	9.5	8.7	6.2		6.5	
19	15.5	19.5	12	7.6	108	12		13	7.5		11	
20	14.5	13	14	7.2	25	13		10.5	16	50	15	8
21	9.5	14	17	7.1	16.5	14	7.5	9.0	11			
22	11.5	16	13	7.5	29	11.5	7.3	12	8.3			
23	15	11.5	14	12.5	23	12.5	7.2	12.5	6.7		8.5	
24	10.5	9.6	11.5	14	19.5	13	7.2	19.5	6.6			
25	7.3	16.5	11	11	19	13	7.1	16.5	6.3	7.5		
26	7.7	12	11	8.7	22	11.5	6.9	12	6.6			
27	8.3	11	16.5	8.3	14.5	9.0	6.8	14.5	6.9			13
28	8.9	9.2	14.5	10	11	8.3	6.7	8.8			6.5	
29	15.5	10.5	14	58	10	13.5	6.7	-------	8	6.1		
30	33	13.5	54	20	9.0	8.0	6.6	-------		6.0		9.2
31	91	11	-------	11	-------	7.5	9.8	-------		-------		-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	91	7.3	19.6	30.3	609	1,860
August	78	9.2	20.8	32.2	645	1,980
September	----------	----------	18.0	27.9	541	1,660
October	58	7.1	13.7	21.2	424	1,300
November	138	6.9	23.4	36.2	703	2,150
December	126	7.5	17.0	26.3	526	1,620
January	----------	6.6	10.3	15.9	320	980
February	19.5	6.2	9.84	15.2	275	846
March	24	----------	10.2	15.8	315	970
April	----------	----------	11.6	17.9	349	1,070
May	28	----------	9.93	15.4	308	945
June	----------	----------	7.87	12.2	236	725
The year	138	----------	14.4	22.3	5,250	16,100

LUMAHAI RIVER NEAR HANALEI, KAUAI

LOCATION.—Water-stage recorder 6 miles above mouth and 4½ miles southwest of Hanalei.

DRAINAGE AREA.—7.1 square miles.

RECORDS AVAILABLE.—May, 1914, to October, 1917; July, 1920, to June, 1931.

EXTREMES.—Maximum discharge during year, 3,900 million gallons a day or 6,030 second-feet Nov. 18 (gage height, 7.60 feet); minimum, 14 million gallons a day or 22 second-feet June 21.

1914–1917, 1920–1931: Maximum discharge, estimated, 5,000 million gallons a day or 7,740 second-feet Sept. 11, 1922 (gage height, 9.41 feet); minimum, 13.6 million gallons a day or 21 second-feet May 15, 17, 1926.

REMARKS.—Records good for ordinary stages; poor for extremely high stages. No diversions.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	253	238	48	133	35	29	29	28	22	21	19.5	18
2	330	113	83	50	32	270	28	26	121	109	18.5	17.5
3	168	76	97	45	31	97	28	23	99	36	18.5	17.5
4	88	50	65	42	30	52	28	23	39	23	18.5	17.5
5	80	41	42	49	30	38	33	23	44	23	17.5	17
6	57	170	39	143	30	35	28	22	27	33	18	17
7	44	52	38	68	157	39	36	22	23	38	26	17
8	48	41	35	49	102	37	49	22	22	27	26	16.5
9	38	35	32	48	49	32	30	26	34	22	28	16
10	38	92	32	43	45	51	29	30	40	21	72	16
11	80	180	90	37	113	64	41	23	30	20	40	16
12	102	352	38	34	213	38	85	22	23	20	66	16
13	100	80	34	32	70	33	123	22	21	20	30	16
14	49	58	37	31	46	32	63	27	21	19.5	56	16
15	40	70	65	30	42	31	38	23	21	19.5	32	15.5
16	37	52	270	31	38	38	31	30	20	22	26	35
17	33	67	74	31	87	106	33	24	20	20	24	36
18	32	95	51	31	754	72	36	24	20	19.5	23	17
19	45	86	39	30	519	42	28	32	20	160	23	16
20	58	60	46	29	86	42	27	25	23	317	23	15
21	37	52	51	29	53	59	25	22	21	42	22	14.5
22	42	60	46	29	52	40	22	30	21	28	21	25
23	52	42	50	36	48	41	22	31	20	27	20	29
24	39	38	38	44	42	40	21	53	20	24	22	19.5
25	32	62	36	40	40	35	21	47	19.5	23	20	29
26	30	44	37	31	46	34	20	28	19.5	23	20	58
27	30	42	53	30	39	30	20	35	19.5	23	19.5	38
28	29	37	42	33	34	30	20	25	19.5	22	19.5	44
29	32	37	42	135	31	72	19.5	-------	19.5	22	19.5	23
30	91	42	116	76	30	32	19	-------	26	22	18.5	23
31	195	38	-------	41	-------	30	28	-------	39	-------	18.5	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	330	29	75.1	116	2,330	7,140
August	352	35	80.7	125	2,500	7,680
September	270	32	58.9	91.1	1,770	5,420
October	143	29	48.7	75.4	1,510	4,630
November	754	30	97.5	151	2,920	8,980
December	270	29	52.3	80.9	1,620	4,980
January	123	19	34.2	52.9	1,060	3,250
February	53	22	27.4	42.4	768	2,350
March	121	19.5	30.1	46.6	934	2,800
April	317	19.5	41.6	64.4	1,250	3,830
May	72	17.5	26.6	41.2	826	2,530
June	58	14.5	22.4	34.7	672	2,060
The year	754	14.5	49.8	77.1	18,200	55,700

ISLAND OF OAHU

RIGHT BRANCH OF NORTH FORK OF KAUKONAHUA STREAM NEAR WAHIAWA, OAHU

LOCATION.—Water-stage recorder 200 feet upstream from intake of Wahiawa Water Co.'s tunnel, which is just below confluence of right and left branches of north fork of Kaukonahua Stream and 8 miles northeast of Wahiawa.

DRAINAGE AREA.—1.2 square miles.

RECORDS AVAILABLE.—May, 1913, to June, 1931.

EXTREMES.—Maximum discharge during year, 720 million gallons a day or 1,110 second-feet July 31 (gage height, 7.30 feet); minimum, 0.2 million gallons a day or 0.3 second-foot June 16, 22.

1913–1931: Maximum discharge, about 985 million gallons a day or 1,520 second-feet Mar. 26, 1920 (gage height, 9.00 feet; determined from flood marks and by comparison with record of left branch of north fork of this stream); minimum, 0.09 million gallons a day or 0.15 second-foot Mar. 22, 1926.

REMARKS.—Records good for ordinary stages and poor for high stages. No diversions above station.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	11.5	47	7.0	53	1.4	1.1	0.6	2.0	1.7	0.6	0.4	0.5
2	7.6	19	31	19	1.2	1.0	.6	2.8	2.6	.6	.4	.4
3	10.5	10.5	7.5	50	1.2	1.8	.5	.8	2.4	.6	.4	.4
4	4.4	6.6	21	51	1.1	3.9	.5	.6	1.6	.4	.4	.4
5	3.6	29	13.5	23	1.6	1.5	.8	.6	1.0	2.1	.4	.3
6	3.0	24	7.6	36	1.1	1.6	.6	.5	.8	6.2	.4	.3
7	16.5	5.5	14	11	1.0	1.2	20	.5	.7	6.6	.4	.3
8	7.6	4.3	8.9	13.5	1.0	1.4	26	.4	.6	1.7	.4	.3
9	3.3	3.6	5.2	7.9	2.2	1.1	5.9	.6	.6	1.0	.4	.3
10	2.5	46	34	9.3	1.0	.8	2.2	1.0	.7	.7	1.0	.3
11	2.3	76	33	5.8	.9	1.0	1.8	1.1	.6	.7	3.6	.3
12	3.6	49	7.3	5.0	3.0	5.4	1.4	1.0	.6	.6	7.4	.3
13	2.4	12	5.7	4.4	1.2	1.4	5.8	.5	.5	.6	1.1	.3
14	30	10.5	18.5	4.0	.8	2.2	2.7	4.9	.5	.6	1.3	.2
15	24	12.5	34	3.7	1.4	1.8	1.5	1.2	.5	.5	.7	.2
16	5.4	6.4	49	3.4	1.5	8.2	1.1	13	.5	.5	1.0	.2
17	3.0	12	104	3.0	9.2	10.5	1.0	1.7	.4	.5	.6	6.9
18	3.6	14.5	27	2.9	78	5.4	1.0	.8	.5	7.4	2.5	.7
19	16.5	29	25	3.0	35	2.0	.8	.6	.4	1.0	.6	.4
20	6.0	8.1	16	2.3	5.2	1.4	.8	1.0	14	9.6	.7	.3
21	29	23	32	2.1	3.5	1.1	.8	1.2	1.2	1.3	3.3	.2
22	13.5	14.5	19.5	2.1	8.7	1.0	.8	5.4	.6	.8	2.1	.4
23	18.5	11	13	2.3	3.6	.9	.7	1.4	.6	.8	9.6	4.2
24	11.5	6.0	11.5	2.4	2.9	.8	.7	.8	.6	.7	2.4	.8
25	6.9	18	7.3	2.4	2.9	1.8	.6	.8	.5	.6	1.0	1.6
26	12.5	8.4	6.0	2.2	2.3	.8	.6	3.6	1.2	.7	.7	2.2
27	4.7	12.5	5.4	1.6	2.0	.8	.6	20	1.8	.6	.5	.7
28	8.9	8.7	8.4	1.5	1.7	.7	.6	3.0	1.0	.5	.9	.4
29	22	78	5.1	1.7	1.4	4.2	.6	------	.6	.5	4.2	.3
30	91	11.5	59	3.8	1.2	.8	.6	------	.6	.4	1.0	7.9
31	277	9.4	------	1.7	------	.6	.5	------	.6	------	.5	------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	277	2.3	21.4	33.1	663	2,030
August	78	3.6	20.2	31.3	626	1,920
September	104	5.1	21.2	32.8	636	1,950
October	53	1.5	10.8	16.7	335	1,030
November	78	.8	5.97	9.24	179	550
December	10.5	.6	2.20	3.40	68.2	209
January	26	.5	2.67	4.13	82.7	254
February	20	.4	2.56	3.96	71.8	220
March	14	.4	1.31	2.03	40.5	124
April	9.6	.4	1.65	2.55	49.4	152
May	9.6	.4	1.62	2.51	50.3	154
June	7.9	.2	1.07	1.66	32.0	98
The year	277	.2	7.77	12.0	2,830	8,690

LEFT BRANCH OF NORTH FORK OF KAUKONAHUA STREAM NEAR WAHIAWA, OAHU

LOCATION.—Water-stage recorder 100 feet upstream from intake of Wahiawa Water Co.'s tunnel, which is just below confluence of the right and left branches of North Fork of Kaukonahua Stream and 8 miles northeast of Wahiawa.

DRAINAGE AREA.—1.5 square miles.

RECORDS AVAILABLE.—May, 1913, to June, 1931.

EXTREMES.—Maximum discharge during year, 2,160 million gallons a day or 3,340 second-feet July 31 (gage height, 8.34 feet); minimum, less than 0.1 million gallons a day or 0.2 second-foot June 15.

1913–1931: Maximum discharge, about 4,080 million gallons a day or 6,310 second-feet Jan. 14, 1923 (gage height, 10.3 feet); minimum, that of June 15, 1931.

REMARKS.—Records fair for ordinary stages; poor for high stages and estimated periods. No diversions above station.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	16.5	48	11	73	2.2	1.8	0.4	1.7	3.3	2.2	0.2	0.4
2	14	23	34	27	2.2	1.5	.5	5.1	4.5	.6	.2	
3	22	15.5	11.5	49	2.0	5.1	.4	1.0	6.2	.4	.2	
4	8.9	12	25	51	2.0	13	.4	.4	3.3	.2	.1	[a].3
5	7.4	19.5	32	23	2.4	2.7	.9	.3	2.4	2.7	.1	.3
6	7.2	25	17	34	2.2	2.4	.5	.3	1.8	9.8	.2	.3
7	14.5	9.5	20	13.5	2.0	2.4	15	.2	1.5	9.0	.2	.2
8	11.5	8.2	15	15.5	1.8	3.3	26	.2	1.4	2.0	.2	.2
9	5.8	7.2	9.7	11	3.5	2.7	9.0	.3	1.4	.9	.2	.2
10	5.0	49	28	10.5	2.2	2.2	2.9	.5	2.7	.4	1.1	.8
11	4.6	69	28	7.6	2.0	2.7	2.6	.5	1.8	.4	16.5	.4
12	5.4	69	10.5	6.0	4.5	6.6	2.4	.4	1.6	.3	13	.4
13	4.8	17	8.6	5.7	3.3	2.6	14.5	.3	1.5	.3	3.1	.2
14	25	22	21	5.7	2.0	6.6	5.8	4.6	1.5	.3	6.2	[b].1
15	23	18	28	5.3	4.7	3.9	3.1	3.1	1.5	.3	1.2	[b].1
16	7.7	12	27	4.8	3.5	10.5	2.4	17.5	1.2	.9	5.2	[a] 3.3
17	4.8	17	116	4.4	13	17	2.4	1.8	1.0	.6	.9	29
18	6.0	[a] 25	21	4.2	200	11	2.2	.9	1.0	5.4	4.0	1.6
19	23	[a] 33	19.5	4.2	72	3.7	1.6	.9	1.0	.8	1.1	.6
20	7.9	14.5	16	3.7	8.9	2.7	1.4	2.4	22	10.5	3.4	.4
21	19	25	23	3.3	6.3	2.2	2.0	2.9	4.2	1.3	5.1	.4
22	12.5	18	38	4.2	12.5	1.6	2.0	7.1	2.7	.5	3.7	3.1
23	31	20	25	6.2	5.5	1.5	2.0	3.9	2.2	.4	10.5	12
24	23	13.5	19	6.0	4.4	1.2	2.0	2.9	2.2	.4		5.3
25	10.5	34	11	5.7	4.6	3.3	1.8	3.3	1.8	.4		6.5
26	11.5	16	9.5	4.8	3.3	1.2	1.6	7.1	2.2	.4		5.4
27	6.6	21	9.5	3.7	2.9	.9	1.5	24	4.4	.3	2.3	2.1
28	18	20	17	3.3	2.7	.7	1.2	5.7	3.5	.3		1.4
29	40	91	10	2.9	2.4	6.7	1.2	-------	2.2	.2		1.0
30	109	16	50	4.8	2.0	.9	.9	-------	1.6	.2		17
31	455	14.5	-------	2.6	-------	.6	.6	-------	2.0	-------		-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	455	4.6	31.0	48.0	961	2,950
August	91	7.2	25.9	40.1	802	2,460
September	116	8.6	23.7	36.7	711	2,180
October	73	2.6	13.1	20.3	407	1,250
November	200	1.8	12.8	19.8	383	1,180
December	17	.6	4.04	6.25	125	384
January	26	.4	3.59	5.55	111	342
February	24	.2	3.55	5.49	99.3	305
March	22	1.0	2.95	4.56	91.6	281
April	10.5	.2	1.75	2.71	52.4	161
May	16.5	.1	3.06	4.73	95.0	291
June	29	.1	3.13	4.84	93.8	288
The year	455	.1	10.8	16.7	3.930	12.100

[a] Partly estimated. [b] Estimated.

PUHAWAI STREAM AT LUALUALEI, NEAR WAIANAE, OAHU

LOCATION.—Duplex water-stage recorder in Lualualei Valley, 1 mile north of McCandless ranch house and 5 miles northeast of Waianae.

DRAINAGE AREA.—0.6 square mile.

RECORDS AVAILABLE.—September, 1930, to June, 1931.

EXTREMES.—Maximum discharge during period, 10 million gallons a day or 15.5 second-feet Nov. 18 (gage height, 1.64 feet); minimum, 0.02 million gallons a day or 0.03 second-foot June 27–29.

REMARKS.—Records good for ordinary stages. A 2-inch pipe diverts water above station for domestic supply. Continuous rainfall records are obtained at station. Station was established Sept. 10, 1930.

Daily and monthly discharge, in million gallons, 1930–31

Day	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	-------	2.4	0.05	0.10	0.04	0.08	0.08	0.05	-------	0.06
2	-------	1.15	.05	.07	.05	.09	3.1	.05	-------	.06
3	-------	.53	.04	.07	.05	.08	.09	.05	-------	.06
4	-------	.75	.05	.07	.06	.07	.06	.03	-------	.06
5	-------	3.0	.05	.07	.06	.08	.05	.05	-------	-------
6	-------	1.2	.03	.07	.05	.06	.03	.06	-------	-------
7	-------	.53	.03	.06	.08	.06	.04	.05	-------	-------
8	-------	.34	.03	.06	.10	.06	.05	.05	.06	-------
9	-------	.28	.14	.06	.08	.08	.05	.04	.05	-------
10	0.07	.20	.08	.06	.06	.05	.06	.03	.05	-------
11	.08	.15	.08	.06	.06	.05	.05	.03	.05	-------
12	.05	.12	.08	.06	.06	.05	.05	.03	.06	-------
13	.05	.10	.06	.06	.11	.04	.05	.03	.05	.03
14	.05	.22	.05	.06	.09	.05	.05	.02	.05	.03
15	.05	.18	.05	.05	.07	.05	.06	.02	.04	.02
16	.05	.13	.06	.05	.07	.05	.05	.02	.05	.03
17	.19	.12	.07	.06	.08	.05	.05	.02	.05	.10
18	.12	.09	1.5	.09	.14	.03	.05	.03	.43	.04
19	.81	.08	.74	.06	.06	.03	.07	.04	.17	.03
20	1.75	.07	.36	.05	.06	.04	.14	[a] 2.6	.12	.03
21	.31	.07	.19	.05	.06	.03	.07	-------	.78	.02
22	.16	.06	.19	.05	.06	.03	.05	-------	.25	.02
23	.13	.06	.16	.05	.07	.04	.05	-------	.26	.04
24	.08	.06	.14	.05	.09	.05	.05	-------	.19	.03
25	.06	.06	.12	.05	.08	.05	.05	-------	.12	.04
26	.05	.05	.36	.05	.08	.03	.06	-------	.10	.03
27	.05	.05	.30	.05	.08	.04	.05	-------	.08	.02
28	.05	.05	.17	.05	.06	.12	.05	-------	.08	.02
29	.05	.05	.12	.06	.06	-------	.04	-------	.08	.02
30	.30	.06	.10	.04	.08	-------	1.2	-------	.08	.03
31	-------	.05	-------	.04	.07	-------	.10	-------	.06	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
September 10–30	1.75	0.05	0.215	0.333	4.51	14
October	3.0	.05	.395	.611	12.3	38
November	1.5	.03	.182	.282	5.45	17
December	.10	.04	.059	.091	1.83	6
January	.14	.04	.072	.111	2.22	7
February	.12	.03	.055	.085	1.54	5
March	3.1	.03	.194	.300	6.00	18

[a] Partly estimated.

NOTE.—Data insufficient for estimating discharge Apr. 26 to May 7, June 5–12.

NORTH HALAWA STREAM NEAR AIEA, OAHU

LOCATION.—Duplex water-stage recorder in North Halawa Gulch, 2.6 miles north of Kamehameha Highway and 3½ miles northeast of Aiea post office; elevation 300 feet.

DRAINAGE AREA.—3.6 square miles.

RECORDS AVAILABLE.—August, 1929, to June, 1931.

EXTREMES.—Maximum discharge during period, 4,230 million gallons a day or 6,540 second-feet Nov. 18 (gage height, 13.43 feet); no flow several times during period.

1929–1931: Maximum discharge, that of Nov. 18, 1930; no flow several times.

REMARKS.—Records poor. No diversions. Continuous records of rainfall are obtained at station.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.8	4.7	2.5		0.13	0.07		0	0	0	0	------
2	2.4	1.8	6.9		.10	.06		0	0	0	0	------
3	2.2	.9	3.0		.08	.04		0	0	0	0	------
4	.9	.3	1.6		15.5	.28	0	0	0	0	0	------
5	[a].3	.24	2.3	24	2.2	.15		0	0	0	0	------
6		1.1	1.5		.29	.08		0	0	0	0	------
7		.28	.4		.17	.06		0	0	0	0	------
8		.19	2.0		.08	.04	6	0	0	0	0	------
9		.14	.3		.07	.06		0	0	0	0	------
10	.06	3.4	4.4		.06			0	0	0	0	0
11		7.4	3.0	1.8	.06		.4	0	0	0	0	0
12		26	.5		12			0	0	0	0	0
13		5.2	.29		1.6	.04		0	0	0	0	0
14	12	2.2	.22		.3			0	0	0	0	0
15		1.3	.19	.6	.4			0	0	0	0	0
16	.2	1.6	.28		.5		.1	0	0	0	0	0
17		.8	28	.4	18			0	0	0	0	0
18	.17	4.7	[a]42	.3	618			0	0	0	0	0
19	3.6	4.0		.3	70	2.8		0	0	0	------	0
20	.9	1.6		.3	11.5			0	0	0	------	0
21	.3	1.0	12	.3	3.7	.2		0	0	0	------	0
22	.4	.5		.3	1.8		.02	0	0	0	------	0
23	.7	.3		.4	1.0			0	0	0	------	0
24	.3	.27		.3	.4			0	0	0	------	0
25	.22	.22	2.0	.3	.7	.06	0	0	0	0	------	0
26	.17	.17		.3	.27			0	0	0	------	0
27	.14	.14		.26	.20			0	0	0	------	0
28	.12	.11	.5	.22	.14		[a]0	0	0	0	------	0
29	1.3	61		.18	.10	0	0	------	0	0	------	0
30	6.4	6.2	[b]30	.22	.08		0	------	0	0	------	0
31	9.7	4.6	------	.22	------		0	------	0	------	------	------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	------	------	1.90	2.94	58.9	181
August	61	0.11	4.59	7.10	142	437
September	------	.19	6.56	10.1	197	604
October	------	.18	7.40	11.4	229	704
November	618	.06	25.3	39.1	759	2,330
December	------	------	.331	.512	10.3	32
January	------	------	.463	.716	14.4	44
February	0	0	0	0	0	0
March	0	0	0	0	0	0
April	0	0	0	0	0	0

[a] Partly estimated. [b] Estimated.

MOANALUA STREAM NEAR HONOLULU, OAHU

LOCATION.—Duplex water-stage recorder 4¼ miles from mouth of stream and 5¼ miles north of Honolulu post office.

DRAINAGE AREA.—3.2 square miles.

RECORDS AVAILABLE.—June, 1926, to June, 1931.

EXTREMES.—Maximum discharge during year, 2,370 million gallons a day or 3,670 second-feet Nov. 18 (gage height, 11.58 feet); no flow for several periods during year.

1926–1931: Maximum discharge, that of Nov. 18, 1930; no flow for several periods.

REMARKS.—Records poor. Water for domestic use diverted from stream 1 mile above station by means of a 2-inch pipe. Continuous records of rainfall are obtained at station.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0	1.5	1.45	25	0	0.03	0	0	0	0	0	
2	0	.07	9.1	6.9	0	.02	0	0	0	0	0	
3	0	.02	3.6	12	0	.02	0	0	0	0	0	
4	0	.01	1.2	17	1.0	.02	0	0	0	0	0	
5	0	.01	.75	38	.3	.01	0	0	0	0	0	0
6	0	.02	.45	8.8	0	.01	0	0	0	0	0	
7	0	.02	.15	4.1	0	0	0	0	0	0	0	
8	0	.02	.06	11.5	0	0	2.3	0	0	0	0	
9	0	.03	.03	3.9	0	0	1.05	0	0	0	0	0
10	0	.02	2.2	1.9	0	0	.3	.01	0	0	0	0
11	0	1.9	1.45	1.2	0	0	.1	.01	0	0	0	0
12	0	21	.3	[a].9	0	0	.08	.01	0	0	0	0
13	0	3.2	.06	[a].7	0	0	.07	.01	0	0	0	0
14	6.8	.75	.03	.5	0	0	.07	.01	0	0	0	0
15	4.4	.35	.03	.35	0	0	.07	0	0	0	0	0
16	.01	.15	.03	.2	0	0	.06	0	0	0	0	0
17	0	.08	16.5	.1	3.6	0	.04	0	0	0	0	0
18	0	.04	36	.07	355	.25	.03	0	0	0	0	0
19	0	.2	5.1	.04	36	.7	.02	0	0	0	0	0
20	0	.15	18.5	.03	10.5	.2	.01	0	0	0	0	0
21	0	.05	5.1	.03	5.1	.06	0	0	0	0		0
22	0	.03	6.4	.03	3.0	.02	0	0	0	0		0
23	0	.01	4.8	.02	1.8	.01	0	0	0	0		0
24	0		1.8	.01	1.0	.01	0	0	0	0		0
25	0		1.05	.01	.6	0	0	0	0	0		0
26	0	0	.55	0	.4	0	0	0	0	0	0	0
27	0		.35	0	.25	0	0	0	0	0		0
28	0		.2	0	.1	0	0	0	0	0		0
29	0	84	.1	0	.04	0	0	-------	0	0		0
30	0	4.6	17.5	0	.03	0	0	-------	0	0		0
31	3.7	3.2	-------	0	--------	0	0	-------	0	-------		------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	6.8	0	0.481	0.744	14.9	46
August	84	----------	3.92	6.07	121	373
September	36	.03	4.49	6.95	135	413
October	38	0	4.30	6.65	133	409
November	355	0	14.0	21.7	419	1,290
December	.7	0	.044	.068	1.36	4
January	2.3	0	.135	.209	4.20	13
February	.01	0	.002	.003	.05	0
March	0	0	0	0	0	0
April	0	0	0	0	0	0
May	0	0	0	0	0	0
June	0	0	0	0	0	0
The year	355	0	2.27	3.51	828	2,550

[a] Estimated.

KALIHI STREAM NEAR HONOLULU, OAHU

LOCATION.—Water-stage recorder at Kioi Pool, three-eighths of a mile upstream from Catholic Orphanage and 5 miles north of Honolulu post office.

DRAINAGE AREA.—2.7 square miles.

RECORDS AVAILABLE.—September, 1913, to June, 1931.

EXTREMES.—Maximum discharge during year, 2,730 million gallons a day or 4,220 second-feet Nov. 18 (gage height, 13.81 feet; determined from flood marks inside shelter); minimum, 0.5 million gallons a day or 0.8 second-foot Mar. 23, May 17.

1914–1931: Maximum discharge, that of Nov. 18, 1930; minimum, 0.1 million gallons a day or 0.2 second-foot Apr. 5, 1924, May 12–25, 1926.

REMARKS.—Records good for ordinary stages; poor for high stages and estimated periods. Water for domestic use is diverted from stream above station.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1		6.8	5.4	67		2.7	1.2	1.0	1.4	1.6	0.9	1.8
2		3.4	5.5	18		2.6	1.2	1.6	1.9	1.2	.9	1.7
3		2.6	4.1	17		2.7	1.3	1.2	1.7	1.0	1.1	1.4
4		2.2	3.8			3.9	1.3		1.2	.9	1.0	1.3
5		2.2	3.7	30		2.7	1.2		1.0	1.3	.8	1.2
	1.7							1.0				
6		2.3	3.2			2.5	1.2		.8	2.8	.8	1.1
7		1.8	3.0			2.2	2.0		.8	1.5	1.0	1.1
8		1.6	2.8			2.6	7.9		.9	1.2	.9	1.1
9		1.6	2.7	7.5	2.1	2.2	3.6	[a] .7	.9	1.0	.9	1.0
10		5.5	7.0			1.9	2.0	.8	.9	.9	1.0	1.1
11		9.6	4.6			1.8	1.8	.8	.9	.9	.9	1.1
12		26	3.2			2.2	1.7	.7	.9	.8	1.7	1.0
13		6.6	2.7			1.8	1.8	.7	.8	.8	1.0	1.0
14		4.1	2.8	3.7		1.9	2.0	.8	.8	.8	1.1	.9
15	1.8	3.8	3.6			1.8	1.7	.9	.8	.7	.8	.8
16		3.7	5.4			1.8	1.5	1.4	.8	.8	.8	.9
17		3.1	25			10.5	1.3	.8	.8	.7	.7	1.8
18		5.5	40			5.6	1.3	.6	.9	1.5	3.2	1.9
19		5.3	11.5			3.5	1.2	.7	.9	1.0	1.4	.9
20	[a] 1.3	3.7	38		100	2.6	1.2	.6	1.2	5.8	5.9	.9
21	3.1	4.6	10			2.0	[a] 1.2	.7	.9	1.6	6.0	
22	2.8	3.2	13.5		7.4	2.0	[b] 1.2	.7	.8	1.2	6.1	
23	2.3	2.8	9.2		6.0	1.9	[b] 1.2	.8	.8	1.2	7.4	
24	2.0	2.5	6.3	2.4	5.1	1.8	[b] 1.1	.8	.8	1.0	7.4	
25	1.8	2.2	5.8		4.6	1.8	[b] 1.1	.7	.7	1.3	7.9	1.1
26	1.8	2.1	5.1		4.1	1.8	[a] 1.0	.8	.9	1.2	6.3	
27	1.4	2.1	4.0		3.8	1.6	1.0	1.1	.8	1.0	5.4	
28	1.6	2.5	3.8		3.4	1.6	1.0	.8	.8	1.0	5.3	
29	1.9	207	3.4		3.0	1.6	1.0	-------	.7	.9	7.9	
30	1.7	10.3	47		2.7	1.3	1.0	-------	1.0	.9	5.0	.8
31	58	8.5	-------		-------	1.3	1.0	-------	3.0	-------	2.2	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	58	----------	3.64	5.63	113	346
August	207	1.6	11.3	17.5	349	1,080
September	47	2.7	9.54	14.8	286	878
October	67	----------	9.16	14.2	284	871
November	----------	----------	15.9	24.6	476	1,460
December	10.5	1.3	2.52	3.90	78.2	240
January	7.9	1.0	1.62	2.51	50.2	154
February	----------	----------	.88	1.36	24.7	76
March	3.0	.7	1.02	1.58	31.5	97
April	5.8	.7	1.28	1.98	38.5	118
May	7.9	.7	3.02	4.67	93.7	287
June	1.8	----------	1.13	1.75	33.8	104
The year	----------	----------	5.09	7.88	1,860	5,710

[a] Partly estimated. [b] Estimated.

NUUANU STREAM BELOW RESERVOIR NO. 2 WASTEWAY, NEAR HONOLULU, OAHU

LOCATION.—Water-stage recorder on Pali road in upper Nuuanu Valley, 1 mile above end of car line and 5 miles from Honolulu post office.

DRAINAGE AREA.—3.4 square miles.

RECORDS AVAILABLE.—October, 1913, to June, 1931.

EXTREMES.—Maximum discharge during year, 1,480 million gallons a day or 2,290 second-feet Nov. 18 (gage height, 8.03 feet); minimum, 0.67 million gallons a day or 1.04 second-feet May 16.

1913–1931: Maximum discharge, 1,600 million gallons a day or 2,480 second-feet Jan. 16, 1921 (gage height, 8.74 feet; from flood marks); minimum, 0.06 million gallons a day or 0.09 second-foot Sept. 10, 11, 1925.

REMARKS.—Records fair for ordinary stages; poor for high stages and estimated periods. Reservoirs Nos. 2, 3, and 4 regulate flow, but diversion from them past station was discontinued in January, 1928. The Board of Water Supply diverts ground water from tunnels in drainage area.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.6		8.1	54	7.9		4.7	3.0	3.0			1.65
2			6.3	21	7.6		4.7	3.2	3.6			1.55
3				21	7.1		4.7	2.8	3.4			1.45
4				17	7.1		4.7	2.6	2.8			1.5
5				51	7.4		4.6	2.6	2.4	2.2		1.4
6			5.5	17.5	8.3		4.4	2.6	2.0			1.4
7	1.9	6		15	8.3		7.9	20	1.8		1.2	1.3
8				17.5	8.8		13	56	1.7			1.25
9				14	8.8		6.7	37	1.6			1.25
10				12	8.6	9.5	5.2	9.0	2.2			1.2
11				11.5	8.1		5.0	7.2	2.2			1.2
12				11	8.1		5.0	6.0	2.0			1.2
13			7.5	11	7.9		5.1	5.8	1.95	1.1	1.0	1.2
14				10.5	7.6		5.0	6.5	1.7		1.05	1.1
15				10	8.6		4.6	5.4	1.85		.90	1.1
16	2.9			9.6	10		4.5	5.2	1.7		.82	1.05
17				9.3	11.5		4.4	4.0	1.65		.78	2.3
18				9.3	231		4.3	4.1	1.55		2.8	1.3
19		4.4		8.8	46		4.0	4.0	1.6		1.35	1.2
20			20	8.6	19.5		4.1	3.7	2.2	2.8	1.45	1.2
21				8.6	15.5		4.6	3.7	1.75		2.8	1.15
22				8.3	14.5		4.1	3.4	1.6		2.5	1.2
23				8.3	14		3.9	3.4	1.45		3.4	1.6
24		2.6	9.3	8.3	13		3.8	3.5	1.4		1.9	1.3
25	3.2	[a] 2.5	8.6	8.3	13	5	3.7	3.1	1.35		1.6	1.3
26			8.3	8.1			3.6	3.3	1.4	1.3	1.45	1.3
27		2.5	8.3	7.9			3.6	3.5	1.6		1.55	1.2
28			8.1	7.9	11		4.7	2.9			1.5	1.1
29		149	7.9	8.1			3.8	-------	2.4		2.1	[b] 1.0
30		9.1	25	8.6			3.4	-------			3.5	[b] 1.0
31	[b] 40	9.6	-------	8.1	-------	4.7	2.7	-------		-------	1.95	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	----------	----------	3.86	5.97	120	367
August	149	----------	9.75	15.1	302	928
September	----------	----------	10.7	16.6	321	985
October	54	7.9	13.9	21.5	430	1,320
November	231	7.1	18.8	29.1	563	1,730
December	----------	----------	7.75	12.0	240	737
January	13	2.7	4.79	7.41	148	456
February	56	2.6	7.77	12.0	218	668
March	----------	----------	2.03	3.14	63.0	193
April	----------	----------	1.73	2.68	51.9	159
May	----------	.78	1.57	2.43	48.8	149
June	2.3	----------	1.30	2.01	39.0	120
The year	231	.78	6.97	10.8	2,540	7,810

[a] Partly estimated. [b] Estimated.

WEST BRANCH OF MANOA STREAM NEAR HONOLULU, OAHU

LOCATION.—Water-stage recorder 75 feet above lower highway bridge and 4 miles northeast of Honolulu post office.

DRAINAGE AREA.—1.1 square miles.

RECORDS AVAILABLE.—May, 1913, to January, 1921; August, 1925, to June, 1931.

EXTREMES.—Maximum discharge during year, 1,630 million gallons a day or 2,520 second-feet Nov. 18 (gage height, 4.92 feet; minimum, 0.10 million gallons a day or 0.16 second-foot June 11.

1913–1921, 1925–1931: Maximum stage, 10.4 feet Jan. 16, 1921; from flood marks (discharge, estimated, 2,100 million gallons a day or 3,250 second-feet); minimum discharge, about 0.05 million gallons a day or 0.08 second-foot Mar. 16, 22, 1926.

REMARKS.—Records good for ordinary stages, fair for high stages and estimated periods. No diversions above station.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.4	3.0	2.5	21	0.7	0.9	0.6	0.5	1.1	0.40	0.30	0.40
2	1.6	1.8	3.2	9.7	.75	.85	.5	.55	1.4	.30	.30	.32
3	1.6	1.3	1.8	8.1	.65	.9	.5	.55	1.2	.28	.30	.30
4	1.3	1.2	1.8	6.1	.6	3.4	.5	.5	.9	.22	.32	.30
5		1.2	1.8	15	.65	1.0	.5	.5	.65	.7	.32	.28
6	1.1	1.2	1.6	6.5	.6	.9	.5	.45	.5	1.1	.28	.25
7		1.0	1.4	4.1	.6	.8	3.2	.45	.45	1.2	.32	.25
8	[a] .95	.9	1.3	6.8	.7	1.1	7.6	.45	.40	.55	.35	.22
9	.9	.9	1.2	3.9	.6	.85	2.6	.45	.38	.42	.38	.22
10	.9	5.0	4.2	2.5	.6	.75	1.1	.5	.42	.35	.5	.26
11	.9	8.3	1.9	[a] 2.1	.55	.9	.95	.6	.55	.32	1.9	.22
12	2.0	17	1.3	[b] 1.8	.65	1.4	1.0	.5	.42	.32	2.7	.30
13	1.2	5.5	1.2	[a] 1.7	.6	.85	1.8	.45	.35	.32	.9	.28
14	1.3	2.7	2.6	1.4	.5	1.1	1.2	.95	.32	.30	.95	.25
15	1.1	2.4	1.5	1.3	1.3	.9	1.0	.75	.32	.32	.6	.25
16	.9	2.2	4.7	1.3	3.1	1.0	.9	1.0	.30	.32	.5	.25
17	.8	1.9	9.5	1.3	2.4	10.5	.85	.55	.30	.30	.42	3.2
18	.95	5.2	6.1	1.2	106	7.3	.85	.45	.30	.6	1.6	.6
19	1.5	5.3	4.3	1.1	17	2.9	.75	.42	.32	.32	.75	.42
20	1.1	2.1	16	1.0	6.6	1.4	.75	.42	.65	3.6	.5	.40
21	3.1	3.3	5.1	1.0	4.0	1.2	.7	.42	.42	.75	.95	.3[illegible]
22	1.8	1.7	7.1	1.1	2.7	1.0	.65	.42	.40	.5	2.9	.44
23	2.9	1.3	4.1	1.1	1.9	.95	.6	.38	.35	.42	2.1	1.6
24	1.7	1.3	2.4	1.0	1.5	.9	.6	.5	.32	.35	.95	.75
25	1.3	1.3	1.8	1.1	1.4	.9	.6	.5	.30	.38	.75	1.0
26	1.3	1.3	1.5	.9	1.2	1.2	.6	.5	.32	.38	.6	1.3
27	1.0	3.0	1.4	.85	1.2	.85	.55	.5	.40	.35	.5	.85
28	1.4	12	1.4	.8	1.0	.8	.5	.42	.38	.32	.40	.65
29	1.6		1.3	.9	.95	1.0	.5	-------	.32	.32	1.0	.55
30	1.8	4.9	12.5	1.0	.9	1.2	.5	-------	.32	.32	.9	.5
31	9.8	3.2	-------	.75	-------	.75	.5	-------	.75	-------	.42	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	9.8	0.8	1.69	2.61	52.4	161
August	17	.9	3.72	5.76	115	354
September	16	1.2	3.62	5.60	108	333
October	21	.8	3.50	5.42	108	333
November	106	.5	5.40	8.36	162	497
December	10.5	.75	1.63	2.52	50.4	155
January	7.6	.5	1.10	1.70	34.0	105
February	1.0	.38	.522	.808	14.6	45
March	1.4	.30	.500	.774	15.5	48
April	3.6	.22	.544	.842	16.3	50
May	2.9	.28	.828	1.28	25.7	79
June	3.2	.22	.565	.874	17.0	52
The year	106	.22	1.97	3.05	719	2,210

[a] Partly estimated.

[b] Estimated.

EAST BRANCH OF MANOA STREAM NEAR HONOLULU, OAHU

LOCATION.—Water-stage recorder just below highway bridge 400 feet upstream from confluence with West Branch of Manoa Stream and 4 miles northeast of Honolulu post office.

DRAINAGE AREA.—1.0 square mile.

RECORDS AVAILABLE.—May, 1913, to January, 1921; August, 1925, to June, 1931.

EXTREMES.—Maximum discharge during year, 333 million gallons a day or 515 second-feet Nov. 18 (gage height, 4.57 feet); minimum, 0.8 million gallons a day or 1.2 second-feet June 8–11, 13, 14.

1913–1921, 1925–1931: Maximum gage height, 10.4 feet Jan. 16, 1921; determined from flood marks (discharge, estimated, 2,000 million gallons a day or 3,090 second-feet); minimum discharge, 0.4 million gallons a day or 0.6 second-foot June 7, 8, 1926.

REMARKS.—Records good for ordinary stages; fair for estimated periods; poor for high stages. Water is diverted from stream above station by East Manoa Ditch.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	[a] 4.4	3.4	[a] 3.4	[a] 22	1.6	2.0	1.6	1.4	3.8	1.2	0.8	0.9
2	[a] 2.9	2.7	[a] 6.6	[a] 9.3	1.6	2.0		1.5	2.6	1.1	.8	.9
3	[a] 2.8	2.5	[a] 3.1	[a] 8.5	1.6	2.0		1.4	2.1	1.2	.9	.8
4	[a] 2.5	2.4	2.1	[b] 7.2	1.6	5.2		1.4	1.6	1.2	.8	.8
5	[b] 2.5	2.5	2.0	[a] 14	1.6	2.2		1.4	1.3	2.2	.8	.8
6	[b] 2.5	2.5	1.8	5.4	1.6	2.1	[a] 1.6	1.4	1.2	3.1	.8	.8
7	[b] 2.5	2.4	1.7	4.3	1.6	1.9	19	1.4	1.2	2.4	1.0	.8
8	[a] 2.5	[a] 2.1	1.7	7.9	1.6	2.5	8.7	1.3	1.1	1.4	.9	.8
9	2.5	[a] 1.8	1.7	[a] 5.2	1.6	2.0	3.4	1.4	1.1	1.1	1.0	.8
10	2.4	6.4	4.5	[a] 3.1	1.4	1.8	2.2	1.4	1.2	1.0	1.2	.7
11	2.4	7.2	2.6	2.9	1.6	2.1	2.0	1.5	1.2	1.0	2.9	.8
12	3.5	17.5	1.9	2.7	1.6	3.1	2.2	1.4	1.0	1.0	4.6	.8
13	2.7	4.9	1.9	3.3	1.4	2.0	3.1	1.4	1.1	1.0	1.4	.8
14	2.9	[a] 3.5	2.1	2.7	1.4	2.9	2.4	1.8	1.0	1.0	1.6	.8
15	2.0	[a] 2.9	2.0	2.1	2.4	2.4	2.1	1.5	1.0	1.0	1.0	.8
16	1.5	3.4	3.6	1.9	3.7	2.2	1.9	1.9	1.0	1.1	1.0	.8
17	1.4	3.2	[a] 9.0	1.9	4.1	14	1.7	1.4	1.0	1.0	.9	3.1
18	1.7	5.7	[a] 6.0	1.9	45	7.2	1.6	1.3	1.0	1.2	2.1	1.1
19	2.6	4.3	4.2	1.8	18	4.0	1.6	1.4	1.0	1.0	1.1	1.0
20	2.2	3.2	17.5	1.7	7.2	[a] 3.1	1.6	1.5	1.8	4.0	1.0	1.0
21	3.6	3.9	4.7	1.7	4.9	2.1	1.6	1.6	1.1	1.1	1.5	.9
22	3.1	2.9	5.4	1.8	3.9		1.6	1.3	1.2	.9	4.0	1.1
23	2.7	2.9	[a] 4.8	1.7	3.1		1.5	1.2	1.0	.9	3.3	1.6
24	[a] 2.8	2.9	[b] 2.7	1.6	2.9		1.5	1.5	1.0	1.0	1.5	1.4
25	[a] 2.1	2.9	[b] 2.4	1.6	2.8		1.5	1.3	1.1	1.0	1.3	1.7
26	2.5	2.8	[a] 2.2	1.6	2.7		1.5	1.4	1.1	1.0	1.2	1.9
27	2.0	3.2	2.2	1.6	2.5		1.4	1.3	1.3	.9	1.2	1.1
28	2.6	4.1	2.4	1.6	2.2		1.4	1.3	1.1	.9	1.2	1.0
29	3.4	[a] 29	2.5	1.8	2.2		1.4	-------	1.1	.8	3.6	1.0
30	2.7	5.6	[a] 15	2.2	2.0		1.4	-------	1.2	.8	2.1	1.0
31	7.9	4.3	-------	1.6	-------		1.4	-------	2.0	-------	1.0	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	7.9	1.4	2.77	4.29	85.8	264
August	29	1.8	4.81	7.44	149	458
September	17.5	1.7	4.12	6.37	124	379
October	22	1.6	4.15	6.42	129	395
November	45	1.4	4.38	6.78	131	403
December	14	---------	2.90	4.49	89.8	276
January	19	1.4	2.56	3.96	79.3	244
February	1.9	1.2	1.43	2.21	40.0	123
March	3.8	1.0	1.34	2.07	41.5	127
April	4.0	.8	1.28	1.98	38.5	118
May	4.6	.8	1.56	2.41	48.5	148
June	3.1	.7	1.06	1.64	31.8	98
The year	45	.7	2.71	4.19	988	3,930

[a] Partly estimated. [b] Estimated.

EAST MANOA DITCH NEAR HONOLULU, OAHU

LOCATION.—Water-stage recorder 150 feet east of lower highway and gaging station on East Branch of Manoa Stream and 4 miles northeast of Honolulu post office.

RECORDS AVAILABLE.—May, 1915, to December, 1916; January, 1918, to January, 1921; August, 1925, to June, 1931.

EXTREMES.—Maximum discharge during year, 15 million gallons a day or 23 second-feet Nov. 18 (gage height, 2.00 feet); minimum, 0.16 million gallons a day or 0.25 second-foot Aug. 8, 9.

1915–16, 1918–1921, 1925–1931: Maximum discharge, about26 million gallons a day or 40 second-feet Jan. 16, 1921 (gage height, 2.27 feet); no flow Aug. 26, 1927.

REMARKS.—Records good except those for estimated periods, which are fair. Water diverted from East Manoa Stream about a quarter of a mile above station by means of crude-stone dam.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.34	0.29	0.34	3.1	1.15	1.05	0.97	0.88	1.0	0.53	0.60	0.60
2	.31	.29	.43	1.15	1.15	1.05	.97	.88	1.05	.46	.60	.64
3	.31	.25	.36	1.05	1.1	1.1	1.0	.84	1.0	.46	.60	.60
4	.31	.25	.33	.93	1.05	1.6	1.0	.80	.97	.43	.57	.57
5	[a] .31	.25	1.15	1.95	1.0	1.25	.97	.80	.93	.41	.57	.60
6	[a] .31	.22	1.1	.93	1.0	1.2	.99	.84	.88	.43	.57	.57
7	[a] .33	.22	1.1	.84	1.05	1.15	1.65	.80	.84	.43	.60	.57
8	[a] .34	.20	1.1	1.1	1.05	1.4	2.0	.80	.80	.46	.64	
9	.34	.36	1.0	.93	1.1	1.25	1.25	.84	.76	.60	.60	
10	.34	.25	1.8	.80	.97	1.15	.93	.84	.72	.60	.72	
11	.34	.36	1.4	.76	1.05	1.25	.88	.88	.68	.64	1.0	
12	.34	.88	1.05	.68	1.0	1.6	.84	.84	.72	.64	2.2	.5
13	.36	.36	1.0	.79	1.0	1.35	.84	.80	.72	.57	1.0	
14	.31	.29	1.05	.76	.97	1.5	.93	.88	.68	.41	1.25	
15	.29	.27	.97	2.8	1.25	1.4	.88	.88	.68	.36	.76	
16	.27	.27	1.75	1.3	1.43	1.4	.93	.88	.68	.64	.64	
17	.27	.22	2.0	1.3	1.7	2.0	.93	.76	.64	.64	.60	1.4
18	.34	.25	.86	1.3	1.8	1.4	.93	.76	.64	.72	1.2	
19	.38	.27	.93	1.3		1.0	.93	.72	.64	.68	.68	
20	.36	.25	2.5	1.3	.50	1.15	.88	.68	.68	1.75	.64	
21	.38	.25	.88	1.35	.65	1.25	.93	.68	.64	.76	1.0	.6
22	.38	.22	.78	1.3	.97	1.2	.88	.80	.64	.64	1.25	
23	.36	.20	.68	1.3	1.2	1.2	.88	.80	.57	.64	1.8	
24	.36	.20	1.1	1.3	1.15	1.15	.93	.84	.57	.64	.80	
25	.36	.20	.97	1.3	1.1	1.1	.84	.88	.53	.72	.64	1.2
26	.36	.20	1.0	1.25	1.0	1.25	.88	.88	.53	.68	.57	
27	.34	.25	1.0	1.2	.97	1.1	.84	.88	.57	.68	.57	
28	.36	.29	1.0	1.2	.97	1.05	.32	.88	.60	.60	.53	.8
29	.36	.90	.63	1.25	1.0	.97	.93	-------	.57	.60	1.55	
30	.5	.34	2.1	1.35	1.05	1.0	.93	-------	.57	.60	1.35	
31		.31	-------	1.15	-------	1.0	.90	-------	.60	-------	.80	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	----------	0.27	0.347	0.537	10.8	33
August	0.90	.20	.302	.467	9.36	29
September	2.5	.33	1.08	1.67	32.4	99
October	3.1	.68	1.26	1.95	39.0	120
November	----------	.50	1.11	1.72	33.2	102
December	2.0	.97	1.24	1.92	38.5	118
January	2.0	.32	.966	1.49	30.0	92
February	.88	.68	.823	1.27	23.0	71
March	1.05	.53	.713	1.10	22.1	68
April	1.75	.36	.614	.950	18.4	56
May	2.2	.53	.868	1.34	26.9	83
June	----------	----------	.728	1.13	21.8	67
The year	----------	.20	.837	1.30	305	938

[a] Partly estimated.

PUKELE STREAM NEAR HONOLULU, OAHU

LOCATION.—Water-stage recorder 200 feet upstream from Palolo belt road bridge, five-eighths of a mile above confluence of Pukele and Waiomao Streams, and 4¾ miles east of Honolulu post office.

DRAINAGE AREA.—1.2 square miles.

RECORDS AVAILABLE.—April, 1912, to September, 1913; June, 1926, to June, 1931.

EXTREMES.—Maximum discharge during year, 310 million gallons a day or 480 second-feet Oct. 1 (gage height, 5.47 feet); minimum, 0.15 million gallons a day or 0.23 second-foot occurred between June 25 and 30.

1912–13, 1926–1931: Maximum discharge, 805 million gallons a day or 1,250 second-feet Apr. 11, 1930 (gage height, 7.75 feet, from flood marks); minimum, 0.15 million gallons a day or 0.23 second-foot June 3, 1926, and between June 25 and 30, 1931.

REMARKS.—Records fair for ordinary stages; poor for high stages and estimated periods. A 2-inch pipe diverts water from stream above station. Station was destroyed by flood of Apr. 11, 1930. Records were started again July 12, 1930.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1		0.35	0.6	[a]34	0.5	0.8	0.45	0.35	0.35	0.2		0.45
2		.35	.65	[a]4.0	.5	.75	.45	.35	.3	.2		.45
3	0.95	.35	.65	2.3	.5	.7	.45	.35	.3	.2	0.25	.45
4		.35	.65	1.9	.5	.75	.45	.35	.25	.2		.4
5		.35	.65	9.3	.5	.65	.45	.35	.25	.2		.35
6		.3	.7	2.3	.45	.65	.45	.3	.25	.2		.35
7		.3	.7	1.6	.45	.65	.45	.3	.3	.25		.35
8		.3	.7	2.7	.45	.6	1.1	.3	.3	.25	.2	.3
9	.45	.35	.65	1.6	.45	.6	.55	.25	.3	.25		.3
10		.4	.75	1.4	.45	.55	.5	.25	.3	.25		.25
11		.95	.7	1.4	.45	.55	.5	.25	.3	.25		.25
12		6.5	.65	1.3	.45	.55	.55	.25	.25	.25	.2	.25
13	.5	.7	.65	1.25	.4	.55	.55	.25	.25	.25	.2	.25
14	.45	.55	.65	1.25	.4	.55	.55	.25	.25	.25	.2	.25
15	.45	.65	.65	1.15	.4	.55	.5	.25	.25	.25	.2	.25
16	.45	.65	.75	1.1	.5	.55	.5	.25	.25	.25	.2	.2
17	.45	.65	2.5	1.05	.65	6.2	.5	.25	.25	.25	.2	.2
18	.45	.7	2.1	1.0	41	3.8	.5	.25	.25	.2	.2	.2
19	.4	.75	3.0	.9	17	1.05	.5	.25	.25	.2	.2	.2
20	.4	.75	41	.8	4.0	.5	.5	.25	.25	1.15	.2	.2
21	.4	.75	3.0	.75	1.5	.5	.5	.25	.25	.25	.2	.2
22	.4	.75	2.1	.75	1.3	.55	.5	.25	.25	.25	1.3	.2
23	.35	.7	1.4	.7	1.2	.55	.45	.25	.25	.25	.7	.2
24	.35	.65	1.3	.7	1.2	.5	.45	.25	.25	.25	.45	.2
25	.35	.65	1.25	.65	1.2	.5	.45	.25	.25	.25	.5	
26	.4	.55	1.25	.65	1.15	.5	.45	.25	.2	.25	.5	.2
27	.4	.55	1.2	.65	1.1	.5	.4	.25	.2	.25	.45	
28	.4	.55	1.15	.55	1.05	.5	.4	.25	.2		.45	
29	.35	[a]8.8	1.1	.55	1.0	.55	.4	-------	.2	.25	.5	.15
30	.35	[a].7	6.5	.5	.85	.5	.4	-------	.2		.6	
31	.35	.6	-------	.5	-------	.5	.4	-------	.2	-------	.5	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	----------	----------	0.502	0.777	15.6	48
August	8.8	0.3	1.02	1.58	31.5	97
September	41	.6	2.65	4.10	79.6	244
October	34	.5	2.56	3.96	79.2	244
November	41	.4	2.72	4.21	81.6	250
December	6.2	.5	.877	1.36	27.2	83
January	1.1	.4	.492	.761	15.2	47
February	.35	.25	.273	.422	7.65	24
March	.35	.2	.255	.395	7.90	24
April	1.15	.2	.267	.413	8.00	25
May	1.3	.2	.334	.517	10.4	32
June	.45	.15	.258	.399	7.75	24
The year	41	.15	1.02	1.58	372	1,140

[a] Partly estimated.

WAIOMAO STREAM ABOVE PUKELE STREAM, NEAR HONOLULU, OAHU

LOCATION.—Water-stage recorder 300 feet west of road, 1 mile upstream from confluence of Waiomao and Pukele Streams, and 5 miles east of Honolulu post office.

DRAINAGE AREA.—1.0 square mile.

RECORDS AVAILABLE.—April, 1911, to December, 1912; June, 1926, to June, 1931.

EXTREMES.—Maximum discharge during year, 167 million gallons a day or 258 second-feet Nov. 18 (gage height, 4.17 feet); minimum, 0.02 million gallons a day or 0.03 second-foot Mar. 29, June 16, 17.

1911–12, 1926–1931: Maximum discharge, 461 million gallons a day or 713 second-feet Apr. 11, 1930 (gage height, 6.27 feet); no flow July 27 to Aug. 5, 1926, Sept. 19–21, Oct. 23–24, 1929.

REMARKS.—Records good for ordinary and medium stages; poor for very high stages and estimated period. Board of Water Supply diverts ground water from tunnels in drainage area.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.1	0.4	1.2	26	0.3	0.4	0.4	0.15	0.85	0.6	0.15	0.7
2	.75	.25	1.2	4.9	.3	.35	.35	.25	1.3	.25	.07	.55
3	.65	.25	1.0	3.2	.25	.4	.3	.25	.85	.25	.3	.4
4	.5	.2	.85	2.5	.25	1.6	.3	.15	.5	.2	.3	.3
5	.4	.15	.85	7.5	.2	.65	.35	.2	.4	.65	.15	.25
6	.35	.15	.7	2.5	.2	.5	.25	.2	.3	1.1	.06	.2
7	.3	.1	.85	1.3	.2	.4	.6	.1	.15	.6	.09	.15
8	.25	.1	.9	2.0	.25	1.1	2.4	.2	.2	.4	.1	.1
9	.25	.08	.75	1.6	.4	.7	1.2	.25	.2	.35	.05	.09
10	.25	1.6	2.8	.9	.25	.5	.55	.25	.15	.2	.1	.07
11	.25	1.1	1.8	.65	.2	.6	.55	.15	.25	.25	.2	.06
12	.45	8.3	.7	.55	.25	1.3	.65	.2	.2	.25	1.3	.06
13	.45	1.7	.5	.55	.25	.7	.9	.2	.15	.35	.4	.04
14	.25	.75	.45	.45	.2	.65	.65	.35	.2	.15	.7	.03
15	1.6	.65	.45	.35	.3	.55	.5	.35	.07	.2	.35	.02
16	.2	.65	1.9	.3	.7	.55	.45	.55	.15	.15	.2	.02
17	.15	.45	5.0	.25	1.7	5.8	.4	.3	.06	.2	.15	.55
18	.15	1.5	3.5	.25	37	2.5	.45	.15	.06	.25	1.2	.2
19	.5	1.6	5.0	.25	20	.75	.35	.2	.09	.15	.45	.1
20	.25	.6	34	.25	6.1	.65	.3	.1	.5	3.1	.35	.07
21	.5	.6	3.3	.2	2.5	.6	.2	.2	.3	.7	1.0	.06
22	.55	.4	2.4	.35	1.3	.65	.2	.15	.2	.3	2.7	.06
23	.4	.3	2.0	.25	1.1	.6	.25	.2	.2	.4	3.0	[a] .25
24	.3	.25	1.1	.25	1.3	.55	.25	.2	.06	.2	1.2	
25	.25	.25	.85	.3	1.3	.5	.2	.15	.05	.45	.65	
26	.35	.3	.65	.25	.9	.55	.25	.2	.04	.6	.45	.15
27	.25	.25	.5	.25	.7	.5	.25	.2	.06	.35	.35	
28	.3	.5	.55	.25	.55	.5	.15	.08	.06	.2	.25	
29	.75	9.8	.5	.4	.45	.55	.25	-------	.04	.2	4.4	
30	.65	2.3	6.5	.8	.4	.45	.15	-------	.35	.2	4.2	
31	.5	2.0	-------	.4	-------	.35	.2	-------	2.1	-------	1.1	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	1.6	0.15	0.447	0.692	13.8	42
August	9.8	.08	1.21	1.87	37.5	115
September	34	.45	2.76	4.27	82.8	254
October	26	.2	1.93	2.99	60.0	184
November	37	.2	2.66	4.12	79.8	245
December	5.8	.35	.853	1.32	26.4	81
January	2.4	.15	.460	.712	14.2	44
February	.55	.08	.212	.328	5.93	18
March	2.1	.04	.325	.503	10.1	31
April	3.1	.15	.442	.684	13.2	41
May	4.4	.05	.838	1.30	26.0	80
June	.7	.02	.179	.277	5.38	16
The year	37	.02	1.03	1.59	375	1,150

[a] Partly estimated.

MISCELLANEOUS MEASUREMENTS

Measurements of streams and ditches on the island of Oahu at other than regular gaging stations are listed below:

Miscellaneous discharge measurements on Oahu, 1930–31

Date	Stream	Tributary to—	Locality	Discharge	
				Second-feet	Million gallons a day
June 4	Wahiawa mauka Ditch		Intake near Wahiawa	1.02	0.659

NOTE.—There were 133 measurements made by J. F. Kunesh or under his supervision. These measurements are published in supplement to the report of the board of water supply, City and County of Honolulu, to the legislature of the Territory of Hawaii, sixteenth regular session, under the title "Water Resources of the City of Honolulu, 1928–1930."

ISLAND OF MOLOKAI

HALAWA STREAM NEAR HALAWA, MOLOKAI

LOCATION.—Water-stage recorder 750 feet below confluence of two main branches and 2 miles above mouth of stream and Halawa schoolhouse.

DRAINAGE AREA.—4.6 square miles.

RECORDS AVAILABLE.—August, 1917, to June, 1931.

EXTREMES.—Maximum discharge during year, 1,130 million gallons a day or 1,750 second-feet Nov. 18 (gage height, 9.95 feet); minimum, 1.2 million gallons a day or 1.9 second-feet June 16.

1917–1931: Maximum discharge, about 1,550 million gallons a day or 2,400 second-feet Mar. 31, 1923 (gage height, 11.65 feet); minimum, 0.8 million gallons a day or 1.2 second-feet Oct. 13–15, 19, 1917.

A maximum discharge greater than 1,550 million gallons a day may have occurred on Jan. 20, 1929.

REMARKS.—Records good for ordinary stages; poor for high stages and estimated period. A 1-inch pipe line diverts water a quater of a mile above station for the domestic use of Halawa village.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	48	16.5	35	113	6.2	11	4.3	3.1	5.9	60	5.9	6.2
2	16.5	9.7	75	85	5.2	9.7	4.3	3.4	41	13.5	5.2	5.2
3	37	8.2	13	30	5.2	9.7	4.3	7.1	15	22	8.6	4.7
4	14	7.3	13	30	8.9	19	4.7	6.2	8.9	8.5	14	4.3
5	9.3	7.3	11.5	26	5.2	11	4.5	4.0	19.5	16	6.8	4.0
6	8.2	11	12	30	4.5	11.5	4.7	3.4	7.2	10.5	5.5	3.8
7	10.5	6.5	27	18	4.5	23	38	3.6	5.0	12.5	10.5	3.6
8	10	5.5	116	2	5.3	22	119	2.9	4.5	21	6.8	3.1
9	7.2	5.5	14.5	17.5	9.0	11.5	19	5.6	4.5	6.8	6.8	2.7
10	5.9	54	15	12	23	7.8	10	16	47	5.2	9.0	2.7
11	5.5	17	18	9.7	11	8.4	8.2	5.9	14	4.7	22	3.8
12	6.2	53	10	41	5.2	18.5	7.8	4.0	6.8	4.5	47	2.9
13	11.5	13	8.5	51	4.7	7.8	7.2	3.6	5.0	4.0	11	2.1
14	10.5	9.3	19.5	13	4.5	15.5	6.2	6.2	4.5	3.6	56	1.8
15	12.5	7.8	62	9.7	10.5	8.5	5.0	9.3	3.8	5.6	49	1.6
16	8.5	7.2	43	8.2	35	7.2	4.0	17	3.4	7.5	21	1.3
17	5.5	7.5	45	7.5	86	13	3.8	6.5	4.3	5.5	9.7	13.5
18	6.2	17	109	6.8	[a] 246	23	28	4.7	3.6	21	6.8	4.0
19	32	12	123	6.5		9.7	6.7	5.5	2.9	5.9	8.5	4.8
20	11	7.2	109	5.9	} 44	7.5	4.7	9.9	7.9	172	12	5.1
21	19.5	20	34	5.2		7.5	4.3	5.9	4.3	100	40	5.2
22	8.9	11	36	5.9		6.5	4.0	11.5	3.1	99	38	7.8
23	16	7.5	23	14.5	[a] 113	5.5	3.8	5.2	6.4	86	39	6.2
24	28	6.5	14	7.8	191	5.2	3.6	13.5	5.5	79	11.5	10.5
25	10.5	14	11	7.8	56	5.9	3.4	12.5	3.6	21	8.5	14
26	15.5	13.5	8.9	6.2	30	9.9	3.1	13	3.6	22	7.2	27
27	8.5	14.5	8.9	5.0	19	5.9	3.1	22	7.5	11.5	6.2	6.2
28	26	10.5	12.5	5.2	36	5.2	3.1	8.9	7.8	8.9	5.2	4.7
29	32	6.8	7.8	63	16	5.9	2.9	-------	8.5	7.5	76	4.3
30	25	33	73	14	12.5	5.2	2.9	-------	5.5	6.8	13.5	5.6
31	48	12.5	-------	6.8	-------	4.3	2.7	-------	120	-------	7.5	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	48	5.5	16.6	25.7	514	1,580
August	54	5.5	13.9	21.5	432	1,320
September	123	7.8	36.9	57.1	1,110	3,400
October	113	5.0	22.7	35.1	704	2,160
November	246	4.5	37.6	58.2	1,130	3,460
December	23	4.3	10.4	16.1	322	989
January	119	2.7	10.7	16.6	331	1,020
February	22	2.9	7.87	12.2	220	676
March	120	2.9	12.6	19.5	390	1,200
April	172	3.6	28.4	43.9	852	2,610
May	76	5.2	18.5	28.6	575	1,760
June	27	1.3	5.76	8.91	173	530
The year	246	1.3	18.5	28.6	6,750	20,700

[a] Partly estimated.

WAIKOLU STREAM AT PIPE-LINE CROSSING NEAR KALAUPAPA, MOLOKAI

LOCATION.—Water-stage recorder at elevation 300 feet, 1 mile above mouth of stream and 4 miles southeast of Kalaupapa.

DRAINAGE AREA.—3.7 square miles.

RECORDS AVAILABLE.—June, 1919, to November, 1930.

EXTREMES.—Maximum discharge during period, 1,440 million gallons a day or 2,230 second-feet Nov. 18 (gage height, 7.37 feet); minimum, 4.8 million gallons a day or 7.4 second-feet Oct. 14–22.

1919–1930: Maximum discharge, that of Nov. 18, 1930; minimum, 1.3 million gallons a day or 2.0 second-feet Nov. 1–2, 1925, June 5, 1926.

Maximum stage known, 10.20 feet Dec. 24, 1920.

REMARKS.—Records fair for ordinary stages; poor for estimated periods and extremely high stages. Kalaupapa water-supply system diverts water above station for domestic use. Station destroyed by flood of Nov. 18, 1930.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Day	July	Aug.	Sept.	Oct.	Nov.
1	22	6.2	9.1	5.5	5.5	16	8.4	8.4	10.5	5.0	8.4
2	14.5	6.2	9.8	5.5	5.5	17	8.0	10.5	10.5	4.8	41
3	12	6.0	9.4	5.5	5.5	18	8.4	12	10.5	4.8	142
4	10.5	6.2	9.4	13.5	5.5	19	11	9.4	26	4.8	------
5	10.5	6.2	9.4	[a] 6.9	5.5	20	9.8	8.4	60	4.8	------
6	10.5	6.2	9.4	7.9	7.3	21	12.5	8.4	11	5.0	------
7	10.5	6.0	9.4	6.6	5.7	22	10.5	9.1	7.3	5.0	------
8	9.8	6.0	9.4	18	5.5	23	9.8	8.7	8.4	6.6	------
9	9.4	6.0	9.4		5.5	24	9.4	8.4	6.2	5.7	------
10	9.4	10	9.1		5.5	25	9.4	8.4	6.2	5.3	------
11	9.1	37	12	6.5	5.3	26	8.7	9.1	6.0	5.3	------
12	8.7	30	9.1	[a] 5.3	5.3	27	8.4	9.1	6.0	5.3	------
13	8.7	12	8.4	5.0	5.3	28	14	9.1	5.7	5.3	------
14	8.7	9.4	8.4	5.0	5.3	29	11.5	9.1	5.5	18	------
15	8.7	8.7	13	5.0	5.5	30	7.6	9.1	5.7	7.3	------
						31	6.2	8.7	------	5.7	------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	22	6.2	10.2	15.8	317	970
August	37	6.0	9.94	15.4	308	946
September	60	5.5	11.0	17.0	330	1,010
October	----------	4.8	7.08	11.0	219	674
November 1–18	142	5.3	15.3	23.7	275	845
The period (141 days)	142	4.8	10.3	15.9	1,450	4,440

[a] Partly estimated.

WAIHANAU STREAM NEAR KALAUPAPA, MOLOKAI

LOCATION.—Water-stage recorder above upper end of Waihanau Tunnel, 3¼ miles east of Kalaupapa, and 3½ miles southeast of Kalae.

DRAINAGE AREA.—1.1 square miles.

RECORDS AVAILABLE.—March, 1930, to June, 1931.

EXTREMES.—Maximum discharge during year, 3,200 million gallons a day or 4,950 second-feet Nov. 18 (gage height, 8.62 feet); minimum, 0.09 million gallons a day or 0.14 second-foot Nov. 15.

1930–31: Maximum, that of Nov. 18, 1930; minimum, that of Nov. 15, 1930.

REMARKS.—Records good for ordinary stages; poor for high stages and estimated periods. No diversions above station.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	6.0	0.32	0.24	0.47	0.15	0.50	0.22	0.14	0.14	2.6	0.9	0.31
2	1.4	.27	.30	.33	.15	.41	.20	.14	5.3			.31
3	1.3	.26	.35	.26	.14	.46	.20	.13	1.55			.31
4	.79	.27	.18	2.4	.12	.60	.20	.13	.41	1.1	1.8	.31
5	.66	.24	.16	1.05	.11	.41	.20	.13	3.9			.31
6	.56	.22	.15	.36	8.2	.34	.20	.12	.61		1.6	.30
7	.49	.20	.14	.26	1.2	.41	.20	.13	.27	1.75	1.05	.28
8	.44	.18	.13	3.5	.39	.38	.22	.12	.22	[a]9.2	.96	.27
9	.38	.18	.13	1.0	.24	.34	.22	.17	.24	[a]1.75	1.5	.26
10	.36	.56	.15	.38	.18	.30	.22	.27	2.8	[b] .66	3.1	.26
11	.44	.60	.15	.27	.15	.30	.22	.20	.76		12	.25
12	.39	.95	.13	.23	.11	.41	.20	.15	.38		1.4	.25
13	.38	.45	.12	.21	.12	.30	.18	.14	.27	.5	1.4	.25
14	.33	.32	.12	.20	.12	.27	.18	.15	.24		3.5	.26
15	.49	.26	.12	.18	.15	.24	.18	.17	.22		2.0	.24
16	.45	.26	.12	.16	1.35	.24	.17	.27	.20		.96	.24
17	.30	.51	.13	.14	21	.60	.22	.18	.20	1.3	.84	3.5
18	.32	1.3	.68	.13	206	.84	3.6	.14	.20		.77	.48
19	1.5	.61	.56	.13	9.5	.38	.62	.15	3.8		.73	.55
20	.51	.33	18	.12	2.3	.30	.27	.27	.46		.77	3.9
21	.38	.27	2.3	.13	2.0	.30	.20	.18	.27	38	5.6	7.5
22	.30	.24	.76	.14	1.35	.27	.18	.18	.24	20	1.65	2.6
23	1.5	.23	.64	.22	11.5	.27	.15	.14	.22	8.6	.70	.73
24	.61	.21	.38	.18	7.1	.24	.15	2.3		5.5	.52	.99
25	.33	.20	.33	.15	2.8	.24	.15	.92		3.9	.48	3.2
26	.30	.20	.28	.13	1.6	.24	.14	.38	.22	4.5	.48	4.3
27	.24	.18	.24	.12	.96	.24	.15	.22		2.2	.45	.77
28	2.5	.18	.22	.14	3.4	.24	.15	.17	.22	1.5	.45	.52
29	1.35	.17	.20	.97	1.1	1.1	.14	-------	.20	1.1	7.0	.50
30	.60	.17	.42	.48	.66	.41	.14	-------	.20	[a]1.0	.58	.45
31	.39	.20	-------	.21	--------	.24	.14	-------	15.5	-------	.36	------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	6.0	0.24	0.838	1.30	26.0	80
August	1.3	.17	.340	.526	10.5	32
September	18	.12	.928	1.44	27.8	85
October	3.5	.12	.473	.732	14.6	45
November	206	.11	9.47	14.7	284	872
December	1.1	.24	.381	.589	11.8	36
January	3.6	.14	.310	.480	9.61	30
February	2.3	.12	.278	.430	7.79	24
March	15.5	.14	1.29	2.00	39.9	123
April	--------	--------	5.17	8.00	155	476
May	12	.36	1.84	2.85	57.2	175
June	7.5	.24	1.15	1.78	34.4	106
The year	206	.11	1.86	2.88	679	2,080

[a] Partly estimated. [b] Estimated.

MISCELLANEOUS MEASUREMENTS

Measurements of streams and ditches on the island of Molokai at other than regular gaging stations are listed below:

Miscellaneous discharge measurements on Molokai, 1930–31

Date	Stream	Tributary to—	Locality	Discharge	
				Second-feet	Million gallons a day
Aug. 2	Waihanau Stream	Pacific Ocean	Waihanau Tunnel outlet near Kalaupapa.	0.265	0.176
3	do	do	Kamilaloa-Kahanui boundary near Kalaupapa.	.003	.002
Sept. 14	do	do	Waihanau Tunnel outlet near Kalaupapa.	.068	.044
Aug. 2	do	do	Makai boundary of land of Kahanui, near Kalaupapa.	.141	.091
June 5	do	do	do	.074	.048
Aug. 3	Waileia Stream	do	do	.032	.021
3	Kamilaloa Stream	do	Above Hawaiian Homes Commission's upper dam near Kalaupapa.	.180	.116
3	do	do	Just below pipe-line intake dam near Kalaupapa.	.046	.030
3	do	do	Just above pipe-line intake dam near Kalaupapa.	.067	.043
Sept. 14	Waihii Stream	do	Below dam at old intake near Kalaupapa.	.045	.029
14	do	do	Mauka Waihii Dam near Kalaupapa.	.023	.015
14	do	do	Mauka Waihii Dam with intake open near Kalaupapa.	.224	.145
14	Kahapakai Stream	do	Above Waihanau Tunnel near Kalaupapa.	.031	.020
14	do	do	Above pipe-line intake dam near Kalaupapa.	.067	.043

ISLAND OF MAUI

HONOKAHAU STREAM NEAR HONOKAHAU, MAUI

LOCATION.—Water-stage recorder 1,000 feet above intake of Honokahau Ditch and about 5 miles southeast of Honokahau; elevation 910 feet.

DRAINAGE AREA.—4.2 square miles.

RECORDS AVAILABLE.—March, 1913, to September, 1920; May, 1922, to June, 1931.

EXTREMES.—Maximum discharge during year, 1,830 million gallons a day or 2,830 second-feet Nov. 18 (gage height, 7.58 feet); minimum, 10 million gallons a day or 15.5 second-feet Mar. 20, 29–31, Apr. 9–13.

1913–1920, 1922–1931: Maximum discharge, 2,200 million gallons a day or 3,400 second-feet Feb. 13, 1924 (gage height, 7.92 feet); minimum, 6.2 million gallons a day or 9.6 second-feet June 30, 1926.

REMARKS.—Records good except those for extremely high stages, which are poor. No diversions.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	59	38	16	18.5	12.5	16.5	15	13	12.5	38	12	12
2	26	18	21	32	16	16.5	15	12.5	16.5	29	12	12
3	40	20	17	22	13.5	25	15	14	34	32	12.5	12
4	20	18.5	17.5	18.5	12	23	18	13.5	16	12	23	11.5
5	19	46	40	17	11.5	16.5	18	13	34	43	13.5	11.5
6	20	26	37	25	12	16	18	40	14	68	27	11.5
7	26	16.5	56	22	13.5	19	21	33	12	13	23	11.5
8	19.5	15	21	39	36	28	20	17	11.5	10.5	17	11.5
9	15.5	25	16	17.5	38	18	16	37	11.5	10.5	20	11.5
10	15	236	53	15	23	16.5	15.5	29	41	10	27	11.5
11	15	135	29	15	12	16	20	15	21	10	30	11.5
12	27	65	24	14.5	11.5	18	26	14	12.5	10	54	11.5
13	54	28	54	14	16	16	15	13.5	11.5	10.5	35	14.5
14	20	32	39	14	20	17	14	24	11	11	109	12.5
15	21	28	55	13.5	31	16	14	44	11	22	78	11.5
16	16.5	44	27	13.5	69	27	14.5	45	10.5	21	20	11.5
17	15	52	60	13.5	91	51	14.5	16	10.5	16	15	52
18	16	64	23	13	374	35	34	15.5	10.5	17.5	13.5	18
19	78	42	19.5	13	96	18	17.5	15	10.5	12	13.5	19.5
20	42	19.5	37	13	21	17	14.5	15	10.5	62	13.5	21
21	46	41	22	13	25	34	14	16	10.5	121	13.5	36
22	23	24	43	19.5	32	20	14	15.5	10.5	116	20	25
23	37	18	27	26	57	20	14	14	10.5	56	24	14.5
24	34	18	82	14	38	17	14	39	11	31	14	12.5
25	21	35	30	14.5	27	19	14	28	10.5	16	13	40
26	35	25	17.5	12	21	46	13.5	15	10.5	14.5	12.5	27
27	31	27	25	14	18	16.5	13.5	17	11	15.5	13	12.5
28	106	20	19.5	32	22	15.5	13.5	13.5	10.5	13	13	11.5
29	106	17	26	66	18	82	13	-------	10.5	12	74	11.5
30	66	16.5	53	22	17	18.5	13	-------	10	12	17.5	11.5
31	76	16	-------	13	-------	15.5	13	-------	31	-------	13	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	106	15	37.0	57.2	1,150	3,520
August	236	15	39.5	61.1	1,230	3,760
September	82	16	33.6	52.0	1,010	3,090
October	66	12	19.7	30.5	610	1,870
November	374	11.5	40.2	62.2	1,200	3,700
December	82	15.5	23.5	36.4	730	2,240
January	34	13	16.3	25.2	505	1,550
February	45	12.5	21.3	33.0	597	1,830
March	41	10	14.8	22.9	459	1,410
April	121	10	28.9	44.7	866	2,660
May	109	12	25.7	39.8	796	2,440
June	52	11.5	16.7	25.8	502	1,540
The year	374	10	26.4	40.8	9,660	29,600

HONOKAWAI DITCH NEAR LAHAINA, MAUI

LOCATION.—Water-stage recorder just below intake on Honokawai Stream, 2½ miles above Pioneer Mill Co.'s power house, and 7½ miles northeast of Lahaina.

RECORDS AVAILABLE.—July, 1912, to June, 1931.

EXTREMES.—Maximum discharge during year, 54 million gallons a day or 84 second-feet July 20 (gage height, 2.17 feet); minimum, 3.4 million gallons a day or 5.3 second-feet several times during year.

1912–1931: Maximum discharge, 76 million gallons a day or 118 second-feet Aug. 11, 1929 (gage height, 2.87 feet); no flow occasionally when water is shut out of ditch.

REMARKS.—Records good. Diverts water for irrigation from Honokawai Stream just above station. Regulated by head gates at intake.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	14.5	8.6	3.6	4.5	4.4	4.9	4.6	4.4	3.6	7.2	3.6	3.4
2	7.4	4.2	4.4	8.5	5.2	4.9	4.6	4.4	3.9	8.9	3.5	3.4
3	6.8	4.5	3.9	5.0	5.0	6.4	4.4	4.4	10.5	11	3.6	3.4
4	4.1	3.9	4.1	4.6	4.5	5.4	4.9	4.4	4.2	3.9	3.7	3.4
5	4.4	12.5	12	4.2	4.5	5.2	4.9	4.4	8.3	16.5	3.6	3.4
6	3.9	7.0	6.9	6.2	4.5	5.0	5.5	15.5	3.9	20	7.2	3.4
7	4.4	3.9	8.2	6.8	4.5	5.0	5.6	11	3.6	4.2	5.1	3.4
8	4.0	3.8	5.0	12	10.5	6.8	5.0	5.4	3.6	3.6	3.7	3.4
9	3.8	4.6	3.9	5.0	13	5.2	4.6	14	3.6	3.6	3.9	3.4
10	3.9	42	13	4.2	9.6	4.8	4.5	10.5	6.1	3.6	7.7	3.4
11	3.9	34	12	4.2	4.6	4.8	5.6	4.5	4.5	3.6	5.8	3.4
12	4.8	15	7.3	4.2	4.6	4.6	8.7	4.4	3.7	3.6	14	3.5
13	9.0	8.7	17	4.2	5.4	4.8	4.8	4.2	3.6	3.6	6.1	3.5
14	3.9	12.5	14.5	4.2	8.2	4.9	4.5	7.6	3.6	3.6	33	3.5
15	3.8	10.5	17.5	4.2	11	4.8	4.5	16.5	3.6	6.7	20	3.4
16	3.8	17	7.2	4.2	19	8.9	4.4	14.5	3.6	6.5	4.7	3.5
17	3.8	24	14.5	4.2	25	24	4.4	4.3	3.6	4.1	3.6	16.5
18	3.9	16	5.5	4.2	33	14.5	7.9	4.2	3.6	4.8	3.5	4.9
19	38	11	4.9	4.2	15	5.4	5.2	4.5	3.6	3.6	3.4	5.1
20	21	4.9	11.5	4.2	5.8	5.2	4.5	4.2	3.6	17	3.5	5.8
21	12.5	13	5.7	4.1	5.6	13.5	4.4	4.4	3.6	24	3.5	14.5
22	6.0	6.4	13.5	5.8	13	6.3	4.4	4.3	3.6	25	3.5	8.1
23	9.1	4.5	9.5	11	14	6.3	4.4	4.0	3.6	11.5	4.1	4.3
24	7.1	4.2	23	5.4	8.4	5.0	4.4	12	3.6	10.5	3.6	3.6
25	3.8	11	10	5.5	8.8	4.9	4.4	8.8	3.6	4.3	3.6	18
26	14	8.8	4.8	4.6	6.8	16	4.4	4.3	3.6	3.9	3.4	8.6
27	10	7.7	6.1	4.4	5.4	5.2	4.4	4.9	3.6	4.2	3.4	3.5
28	31	4.9	5.5	7.1	6.4	4.8	4.4	3.8	3.6	3.7	3.4	3.4
29	25	4.0	4.4	17	5.5	28	4.4	-------	3.6	3.6	11.5	3.5
30	5.4	3.8	8.4	7.6	5.2	5.8	4.4	-------	3.6	3.6	3.9	3.4
31	18	3.8	-------	4.5	-------	4.9	4.4	-------	5.7	-------	3.4	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	38	3.8	9.52	14.7	295	906
August	42	3.8	10.3	15.9	321	980
September	23	3.6	8.93	13.8	268	822
October	17	4.1	5.81	8.99	180	553
November	33	4.4	9.21	14.2	276	848
December	28	4.6	7.62	11.8	236	725
January	8.7	4.4	4.89	7.57	152	465
February	16.5	3.8	6.92	10.7	194	595
March	10.5	3.6	4.19	6.48	130	399
April	25	3.6	7.80	12.1	234	718
May	33	3.4	6.15	9.52	190	585
June	18	3.4	5.27	8.15	158	485
The year	42	3.4	7.22	11.2	2,630	8,080

KANAHA STREAM ABOVE PIPE-LINE INTAKE NEAR LAHAINA, MAUI

LOCATION.—Water-stage recorder 200 feet above intake of pipe line for Lahaina and Lahainaluna School and 2¾ miles northeast of Lahaina.

DRAINAGE AREA.—1.8 square miles.

RECORDS AVAILABLE.—February, 1916, to June, 1931.

EXTREMES.—Maximum discharge during year, 206 million gallons a day or 319 second-feet Nov. 18 (gage height, 4.54 feet); minimum, 1.1 million gallons a day or 1.7 second-feet May 5–6.

1916–1931: Maximum discharge, 314 million gallons a day or 486 second-feet Nov. 26, 1918 (gage height, 3.79 feet); minimum, that of May 5–6, 1931.

REMARKS.—Records fair for ordinary stages; poor for high stages. No diversions.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	7.3	4.3	3.3	2.8	2.9	3.3	2.9	3.1	2.0	3.1	1.4	2.2
2	4.5	4.6	4.7	4.0	4.4	3.3	2.9	3.1	2.2	3.8	1.3	2.2
3	3.7	4.3	3.5	3.3	3.3	4.3	2.9	2.9	8.9	8.7	1.2	2.2
4	2.8	4.0	3.5	2.9	2.9	3.5	3.5	2.6	2.8	3.7	1.2	2.0
5	2.8	6.4	6.4	2.8	2.9	3.1	3.5	2.4	2.9	12	1.2	2.0
6	2.8	5.5	4.6	2.8	2.9	3.1	3.3	12.5	2.2	8.2	1.4	1.8
7	2.8	4.0	3.7	5.4	2.9	3.1	3.1	12	2.2	2.8	1.7	1.8
8	2.8	4.0	3.7	6.9	4.9	3.3	2.8	3.1	2.0	2.9	1.3	1.8
9	2.8	4.0	3.1	3.1	9.7	3.1	2.8	11.5	2.0	2.9	1.3	1.8
10	2.8	25	5.1	2.8	4.6	2.9	2.9	7.0	2.4	2.9	2.2	1.7
11	2.8	19	8.6	2.8	2.8	2.8	5.8	2.6	2.2	2.8	2.4	1.7
12	2.8	5.7	6.6	2.8	2.8	2.8	6.5	2.2	2.0	2.8	5.4	1.7
13	3.7	5.0	9.7	2.9	6.1	2.8	2.8	2.2	2.0	2.8	1.4	2.1
14	2.9	10.5	9.0	2.9	6.7	2.8	2.8	4.0	2.0	3.1	8.9	1.7
15	2.9	10.5	8.1	2.9	6.6	2.9	2.8	5.5	2.0	7.1	4.4	1.6
16	2.9	12	3.5	3.1	11	3.3	2.8	6.7	1.8	11	1.8	1.6
17	2.9	19	4.8	3.1	11.5	21	2.8	2.6	1.8	2.2	1.8	12.5
18	3.3	11	4.0	3.3	26	10	3.1	2.4	1.8	2.2	1.8	5.9
19	13.5	6.0	3.7	3.5	18.5	3.3	3.1	2.0	2.0	2.2	2.2	4.2
20	4.8	4.3	7.0	3.5	3.7	3.7	2.9	2.4	2.2	4.6	3.0	6.2
21	6.8	8.1	4.2	3.5	6.6	13	2.8	2.4	2.0	4.9	2.6	15
22	4.0	4.9	6.1	6.6	15	5.6	2.8	3.2	2.0	7.1	2.6	9.4
23	4.6	4.0	6.6	8.6	4.8	5.5	2.9	1.8	2.2	3.4	2.6	3.7
24	4.3	4.0	13	3.7	3.7	3.5	2.9	9.2	2.4	7.3	2.6	2.9
25	3.3	5.7	6.5	4.0	4.7	3.5	2.9	10.5	2.4	2.4	2.6	11
26	6.0	6.2	3.1	3.1	4.0	13	3.1	3.3	2.6	2.2	2.6	7.4
27	6.6	4.6	2.9	2.9	3.5	3.5	2.9	5.1	2.7	2.2	2.6	2.9
28	10	3.7	3.1	2.9	3.5	3.3	2.9	2.0	2.8	1.7	2.6	2.8
29	10.5	3.5	2.8	4.6	3.5	9.9	3.1	-------	2.9	1.7	7.2	2.8
30	4.0	3.5	3.1	3.8	3.3	3.5	3.1	-------	2.9	1.4	2.8	2.8
31	12.5	3.3	-------	2.9	-------	3.1	3.1	-------	3.1	-------	2.4	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	13.5	2.8	4.85	7.50	150	461
August	25	3.3	7.12	11.0	221	677
September	13	2.8	5.27	8.15	158	485
October	8.6	2.8	3.68	5.69	114	350
November	26	2.8	6.32	9.78	190	582
December	21	2.8	5.03	7.78	156	479
January	6.5	2.8	3.18	4.92	98.5	303
February	12.5	1.8	4.65	7.19	130	400
March	8.9	1.8	2.50	3.87	77.4	238
April	12	1.4	4.20	6.50	126	387
May	8.9	1.2	2.60	4.02	80.5	247
June	15	1.6	3.98	6.16	119	366
The year	26	1.2	4.44	6.87	1,620	4,980

OLOWALU DITCH NEAR OLOWALU, MAUI

LOCATION.—Water-stage recorder 425 feet above intake to penstock of hydroelectric power station, 1 mile above Olowalu, and 7 miles east of Lahaina.

RECORDS AVAILABLE.—August, 1911, to June, 1931.

EXTREMES.—Maximum discharge during year, 10.1 million gallons a day or 15.6 second-feet Nov. 18 (gage height, 1.29 feet); minimum, 2.8 million gallons a day or 4.3 second-feet Apr. 19.

1911–1931: Maximum discharge, 18 million gallons a day or 28 second-feet Dec. 25, 1920 (gage height, 1.53 feet); no flow occasionally when water is shut out of ditch.

REMARKS.—Records good except those for estimated periods, which are fair. Intake in Olowalu Stream at about 450 feet elevation. Water used for power and irrigation. Regulated by head gates.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	8.7	8.7	4.9	6.6	4.0	4.9	4.3	3.3	4.0	3.8	3.2	4.7
2	8.7	8.0	6.6	6.6	4.0	4.9	4.0			4.1	3.2	4.1
3	8.7	7.0	5.9	6.2	4.0	5.2	3.9	[a] 3.2		8.4	3.2	3.8
4	8.7	6.2	5.2	5.9	3.8	4.9	4.0	3.1	3.6	4.6	3.2	3.5
5	8.4	5.9	5.9	5.6	3.7	4.6	4.0	3.0	3.9	8.4	3.2	3.4
6	7.3	6.2	6.6	5.6	3.7	4.6	3.8	3.6	3.6	8.7	3.4	3.2
7	6.6	5.2	6.2	5.9	3.8	4.6	3.8	5.6	3.4	7.3	4.2	3.2
8	5.9	4.6	6.2	6.6	3.9	5.2	3.7	3.5	3.4	5.2	3.6	3.2
9	5.6	4.9	5.2	7.3	3.9	4.6	3.6	4.5	3.4	4.3	3.9	3.0
10	5.2	8.4	6.6	6.2	4.3	4.3	3.6		5.2	3.9	4.2	3.0
11	5.2	7.6	6.6	5.6	3.8	4.0	3.8	3.2	4.6	3.8	4.7	3.1
12	5.1	7.6	5.9	5.2	3.6	4.0	4.3		3.8	3.8	6.8	3.0
13	7.0	8.7	8.0	5.6	3.9	4.0	3.7		3.8	3.6	5.0	3.5
14	5.6	8.7	7.6	5.2	4.0	4.0	3.6		3.8	3.8	7.4	3.0
15	5.2	8.7	8.0	4.9	4.3	4.0	3.6	5.5	3.7	4.0	7.4	2.9
16	4.9	8.7	8.0	4.6	6.5	4.0	[a] 3.6		3.6	3.4	7.4	2.9
17	4.6	8.7	7.0	4.6	8.7	6.6	3.9		3.6	3.1	6.5	6.0
18	4.6	8.7	7.3	4.3	8.5	5.2			3.9	3.2	5.0	4.7
19	7.9	8.7	7.3	4.3	5.4	4.3			4.3	2.8	4.7	4.1
20	7.6	8.4	7.6	4.0	7.6	4.3		3.5	3.8	3.2	4.2	4.4
21	8.4	8.0	7.3	4.3	8.7	5.2			3.8	5.9	4.2	5.9
22	6.6	7.3	7.3	4.3	8.7	4.6			3.8	6.5	3.9	6.2
23	6.2	6.6	7.3	4.3	8.7	4.6			3.8	6.8	3.9	4.4
24	7.6	6.2	7.6	4.0	8.4	4.0		5	3.8	6.8	3.4	3.8
25	6.2	7.3	7.6	3.9	8.4	4.0	3.4		3.8	6.8	3.4	6.9
26	6.2	7.0	7.3	3.8	7.6	5.9		3.8	3.7	5.9	3.2	7.3
27	6.2	7.3	7.0	3.8	6.6	4.3			3.7	5.0	3.2	5.0
28	8.7	6.6	6.6	3.9	6.2	4.0			3.6	3.9	3.2	4.1
29	9.1	5.9	6.2	5.9	5.6	7.6		-------	3.5	3.9	5.1	3.8
30	9.1	5.6	7.0	5.6	5.2	5.9		-------	3.7	3.4	8.0	3.5
31	8.7	5.2	-------	4.3	-------	4.6		-------	3.8	-------	5.6	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	9.1	4.6	6.92	10.7	214	658
August	8.7	4.6	7.18	11.1	223	683
September	8.0	4.9	6.79	10.5	204	625
October	7.3	3.8	5.13	7.94	159	488
November	8.7	3.6	5.65	8.74	170	520
December	7.6	4.0	4.74	7.33	147	451
January	-------	-------	3.67	5.68	114	349
February	-------	-------	3.91	6.05	110	336
March	-------	-------	3.82	5.91	118	363
April	8.7	2.8	4.94	7.64	148	455
May	8.0	3.2	4.56	7.06	142	434
June	7.3	2.9	4.12	6.37	124	379
The year	9.1	2.8	5.13	7.94	1,870	5,740

[a] Partly estimated.

RIGHT BRANCH OF KAHALAWE STREAM NEAR KIPAHULU, MAUI

LOCATION.—Water-stage recorder at old ditch intake, elevation 1,100 feet, 2 miles north of Kipahulu.

DRAINAGE AREA.—0.1 square mile.

RECORDS AVAILABLE.—February, 1927, to June 1931.

EXTREMES.—Maximum discharge during year, 595 million gallons a day or 921 second-feet Nov. 18 (gage height, 11.13 feet); minimum, 0.5 million gallons a day or 0.8 second-foot Nov. 7.

1927–1931: Maximum discharge, that of Nov. 18, 1930; minimum, 0.15 million gallons a day or 0.23 second-foot Dec. 16, 1929.

REMARKS.—Records good for ordinary stages; poor for high stages and estimated periods. No diversions.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	4.0	2.4	6.3	3.3	0.9	1.4	1.0	0.8	1.4	1.1	1.3	1.3
2	2.7	2.0	11	10	.9	1.3	.9	.9		6.2	1.2	1.1
3	5.2	1.9	2.4	7.8	.9	1.3	.9	[a] .9		9.1	1.1	1.0
4	2.4	1.8	5.5	9.0	.8	2.4	1.3	[a] 1.3	2.8	1.6	1.1	1.1
5	2.7	6.1	3.8	12	.7	1.3	1.5	1.0		4.0	1.1	.9
6	2.6	4.3	4.2	13	.6	1.3	1.9	.9		2.5	1.0	.9
7	3.3	1.9	4.3	4.6	.6	1.5	[a] 3.2	3.1	1.3	2.0	.9	.9
8	2.4	1.6	2.7	3.3	1.9	3.1	2.8	1.1		2.0	.9	.9
9	2.0	3.6	2.6	3.0	1.8	1.3		2.0	1.8	1.3	.9	.9
10	1.8	6.5	3.0	2.4	1.7	1.3		4.1		1.2	1.1	1.0
11	1.5	4.3	4.2	2.1	5.9	1.3	1.8	1.3	[a] 1.3	1.2	1.3	1.5
12	2.4	11.5	2.4	5.2	1.7	1.2		1.1	1.1	1.1	4.0	1.0
13	4.5	3.0	2.4	13	1.8	1.2		.9	1.0	1.1	1.4	1.2
14	4.1	4.2	3.6	2.3	2.1	2.6		3.6	.9	1.3	5.2	.9
15	2.7	2.3	2.7	1.9	5.4	1.3	.9	2.7	.9	3.5	6.7	.9
16	1.9	3.6	4.4	1.8	6.7	5.8		4.7	1.0	3.4	2.3	.9
17	1.6	3.7	6.7	1.5	19.5	5.3		1.4	3.7	1.4	4.1	7.0
18	1.5	3.0	9.0	1.5	61	3.5	2.0	1.3	2.7	4.3	1.6	1.4
19	3.4	2.0	14	1.4	55	1.3		1.0	1.2	3.6	2.9	2.8
20	3.0	1.8	14	1.2	33	1.3		1.0	1.0	4.3	1.9	2.7
21	5.3	7.4	7.7	2.7	30	1.8	.8	.9	1.0	7.4	1.3	7.4
22	3.0	4.9	4.8	2.4	14.5	1.2		2.4	1.0	2.9	1.2	4.7
23	4.1	2.4	4.9	5.4	6.9	1.4		1.3	1.3	3.3	1.2	3.7
24	3.9	2.9	4.9	1.8	3.2	1.5	[a] .7	3.0	7.2	11	1.1	2.2
25	1.8	13	4.4	1.4	2.6	2.7	.7	2.7	2.1	2.1	1.0	3.6
26	8.3	4.2	2.7	1.1	2.5	6.4	.8	[a] 1.1	1.5	1.6	8.8	4.4
27	2.9	3.8	3.6	.9	2.1	1.3	.7	1.0	1.3	1.4	3.8	2.3
28	4.2	2.4	3.0	.9	1.9	1.2	.7		2.5	1.4	1.4	1.8
29	3.9	2.0	3.2	3.2	1.8	3.4	.7	-------	7.9	1.3	6.7	1.6
30	8.8	3.8	7.0	1.6	1.6	1.3	.7	-------	2.8	1.3	1.6	3.0
31	4.9	3.1	-------	.9	-------	1.1	.7	-------	1.3	-------	1.3	------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	8.8	1.5	3.45	5.34	107	328
August	13	1.6	3.92	6.07	121	373
September	14	2.4	5.18	8.01	155	477
October	13	.9	3.95	6.11	123	376
November	61	.6	9.00	13.9	270	829
December	6.4	1.1	2.07	3.20	64.3	197
January	----------	----------	1.26	1.95	39.1	120
February	4.7	.8	1.73	2.68	48.5	149
March	----------	----------	2.05	3.17	63.4	195
April	11	1.1	3.00	4.64	89.9	276
May	8.8	.9	2.30	3.56	71.4	219
June	7.4	.9	2.17	3.36	65.0	200
The year	61	----------	3.34	5.17	1,220	3,740

[a] Partly estimated.

HANAWI STREAM NEAR NAHIKU, MAUI

LOCATION.—Water-stage recorder 200 feet above Koolau Ditch intake and trail, 1¾ miles southeast of Nahiku, and 4½ miles southeast of Keanae.

DRAINAGE AREA.—0.8 square mile.

RECORDS AVAILABLE.—January, 1914, to January, 1916; November, 1921, to June, 1931.

EXTREMES.—Maximum discharge during year, 710 million gallons a day or 1,100 second-feet Nov. 18 (gage height, 8.20 feet); minimum, 2.2 million gallons a day or 3.4 second-feet Feb. 5.

1914–1916, 1921–1931: Maximum stage, from flood marks, about 20 feet during flood of Jan. 18, 1916 (discharge not determined); minimum discharge, 1.4 million gallons a day or 2.2 second-feet July 5, 8, 1926.

REMARKS.—Records good for ordinary stages; poor for extremely high and low stages. No diversions.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	19.5	7.5	5.2	19.5	3.2	5.6	3.6	2.7	3.8	18.5	5.7	3.4
2	11.5	6.2	5.0	6.8	3.3	5.6	3.3	2.5	4.1	65	5.8	3.2
3	8.8	6.7	4.7	5.3	3.0	5.7	3.2	2.4	15.5	94	6.3	3.1
4	7.7	5.3	4.5	6.4	2.7	5.3	3.1	2.4	5.2	6.1	10	3.0
5	7.5	16	4.9	14.5	2.5	5.1	3.1	2.4	10.5	19	6.3	3.0
6	7.3	9.7	6.6	18	7.9	4.9	3.6	2.7	5.1	22	7.0	2.9
7	7.1	6.1	5.2	7.8	4.1	4.7	4.1	5.8	3.5	5.7	7.5	2.7
8	7.0	5.2	4.3	7.2	4.3	4.6	4.4	2.7	3.3	4.5	5.6	2.7
9	6.8	13.5	4.0	5.6	3.5	4.2	3.6	5.8	3.4	3.9	6.4	2.7
10	6.8	63	4.9	4.9	2.7	4.7	3.2	4.9	5.8	3.6	8.8	2.6
11	6.6	102	5.7	4.6	2.5	4.0	3.2	2.9	4.7	3.4	8.3	2.5
12	7.4	18.5	6.2	4.4	2.6	3.8	3.9	2.5	3.5	3.2	10	2.5
13	23	9.6	16	4.2	3.7	3.7	3.3	2.4	3.2	3.1	11	2.5
14	10.5	15	13.5	3.9	6.4	3.9	3.1	2.9	3.2	3.2	44	2.5
15	7.3	18.5	13.5	3.9	6.7	3.5	3.0	3.6	3.2	5.2	23	2.4
16	6.4	20	12.5	3.8	32	6.7	3.0	5.0	3.2	10	7.6	2.5
17	5.9	18.5	7.8	3.7	75	16.5	2.8	3.1	3.2	3.9	5.8	5.6
18	5.7	15.5	5.9	3.7	195	9.6	4.8	2.9	3.2	3.4	5.1	3.9
19	8.1	9.6	5.1	3.6	72	4.6	3.6	2.7	3.1	3.2	4.6	7.4
20	8.2	7.7	16.5	3.5	9.6	3.9	2.9	2.8	3.1	54	4.2	9.2
21	7.3	8.7	4.9	3.5	20	19	2.8	3.2	3.0	149	4.8	17.5
22	5.9	7.7	6.0	3.8	7.5	4.1	2.7	4.1	3.0	109	7.6	14
23	5.5	7.5	13	4.8	28	5.0	2.6	3.9	3.0	37	5.2	5.2
24	5.6	7.5	51	4.0	25	5.5	2.6	18	3.0	11	3.9	3.9
25	4.8	8.6	22	3.5	8.1	3.9	2.5	53	2.8	8.6	3.6	10
26	7.0	7.6	8.4	3.4	6.3	20	2.5	18.5	2.8	6.4	3.5	9.3
27	10.5	7.8	6.3	3.2	5.7	4.3	2.5	13.5	2.7	5.7	3.4	5.8
28	38	6.8	6.1	4.6	5.6	3.5	2.5	4.9	2.7	5.3	3.3	4.0
29	53	6.3	5.3	13.5	5.6	57	2.5	-------	2.7	5.5	48	3.7
30	15	5.9	5.6	4.8	5.6	6.2	2.4	-------	2.6	5.7	6.1	3.4
31	8.8	5.6	-------	3.5	-------	4.1	2.4	-------	6.8	-------	3.6	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	53	4.8	11.0	17.0	340	1,050
August	102	5.2	14.6	22.6	454	1,390
September	51	4.0	9.35	14.5	281	861
October	19.5	3.2	6.06	9.38	188	577
November	195	2.5	18.7	28.9	560	1,720
December	57	3.5	7.85	12.1	243	747
January	4.8	2.4	3.12	4.83	96.8	297
February	53	2.4	6.58	10.2	184	565
March	15.5	2.6	4.16	6.44	129	396
April	149	3.1	22.6	35.0	678	2,080
May	48	3.3	9.23	14.3	286	878
June	17.5	2.4	4.90	7.58	147	451
The year	195	2.4	9.83	15.2	3,590	11,000

KAPAULA STREAM NEAR NAHIKU, MAUI

LOCATION.—Water-stage recorder 40 feet above intake to Koolau Ditch, 300 feet above ditch trail, 1¾ miles southwest of Nahiku, and 4 miles southeast of Keanae.

DRAINAGE AREA.—0.2 square mile.

RECORDS AVAILABLE.—November, 1921, to June, 1931.

EXTREMES.—Maximum discharge during year, 1,340 million gallons a day or 2,070 second-feet Nov. 18 (gage height, 7.21 feet); minimum, 1.1 million gallons a day or 1.7 second-feet June 16.

1921–1931: Maximum discharge, 1,400 million gallons a day or 2,170 second-feet Dec. 18, 1929 (gage height, 7.39 feet); minimum, 0.6 million gallons a day or 0.9 second-foot July 5, 1926.

REMARKS.—Records good for ordinary stages; poor for extremely high stages. No diversions.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	11.5	5.4	2.8	22	1.8	2.2	2.9	1.5	3.0	23	3.0	2.9
2	10.5	4.1	2.7	6.5	2.1	2.1	2.4	1.4	4.8	57	2.9	2.4
3	8.7	4.9	2.6	4.0	1.9	2.0	2.3	1.4	19.5	55	3.1	2.1
4	6.3	3.5	2.6	4.4	1.8	2.0	2.2	1.3	6.3	5.9	9.2	1.9
5	5.6	15	3.2	15.5	1.8	2.0	2.1	1.3	12	22	4.1	1.8
6	4.6	8.7	5.4	15.5	7.2	1.9	2.9	1.6	6.5	20	4.8	1.6
7	3.9	3.9	3.8	7.4	4.4	1.8	3.4	7.9	3.5	5.2	5.9	1.4
8	3.5	3.0	2.6	7.0	4.6	2.0	3.9	2.1	2.8	3.4	4.4	1.4
9	3.1	13	2.3	4.0	3.0	1.8	2.9	5.8	3.1	2.9	4.9	1.4
10	2.9	56	3.4	3.1	2.1	2.4	2.0	5.0	6.0	2.7	6.6	1.3
11	2.6	66	4.0	2.9	1.8	1.9	2.0	2.2	4.6	2.4	8.3	1.2
12	4.0	14	4.8	2.7	1.8	1.8	2.8	1.7	2.9	2.3	10	1.3
13	19	6.6	13	2.4	3.4	1.7	2.1	1.5	2.4	2.2	8.2	1.2
14	8.4	10.5	13	2.2	11.5	1.8	1.8	1.9	2.1	2.4	45	1.1
15	3.9	17	13	2.0	8.8	1.8	1.6	3.0	1.9	5.3	30	1.1
16	3.2	19.5	11	2.0	35	5.8	1.5	4.8	1.8	10	7.5	1.1
17	2.9	17	5.6	1.9	77	19.5	1.4	2.2	1.8	3.8	4.6	4.0
18	3.0	14	3.4	1.8	220	12	3.9	1.9	1.7	2.9	3.9	2.8
19	6.8	7.7	2.8	1.8	55	4.1	2.6	1.8	1.6	2.4	3.6	6.5
20	5.6	5.2	4.3	1.8	6.5	3.0	1.8	1.9	1.6	67	3.4	8.5
21	5.2	6.8	3.0	1.7	13	15.5	1.6	2.3	1.6	139	7.8	17
22	3.5	5.1	3.9	1.8	6.6	3.9	1.4	4.2	1.5	94	11.5	14
23	3.1	4.6	9.8	3.6	26	5.8	1.4	4.2	1.4	29	6.6	4.1
24	3.4	4.6	46	2.3	20	5.9	1.4	22	1.4	8.3	3.9	2.4
25	2.7	6.6	19.5	1.9	6.3	3.8	1.4	45	1.4	6.1	3.2	8.4
26	5.3	4.6	7.5	1.8	4.1	24	1.4	19.5	1.4	4.6	2.9	8.2
27	7.1	4.9	4.7	1.7	3.2	4.1	1.3	14.5	1.4	4.1	2.7	4.6
28	30	3.9	4.6	3.4	2.9	2.9	1.3	4.7	1.3	3.8	2.6	2.6
29	48	3.2	4.0	16	2.6	51	1.3	-------	1.3	3.5	53	2.2
30	17	3.0	4.6	3.8	2.3	6.1	1.3	-------	1.3	3.4	6.8	1.9
31	7.0	2.9	-------	2.1	-------	3.5	1.3	-------	7.1	-------	3.5	------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	48	2.6	8.14	12.6	252	774
August	66	2.9	11.1	17.2	345	1,060
September	46	2.3	7.13	11.0	214	656
October	22	1.7	4.87	7.54	151	463
November	220	1.8	18.0	27.9	538	1,660
December	51	1.7	6.45	9.98	200	614
January	3.9	1.3	2.05	3.17	63.6	195
February	45	1.3	6.02	9.31	169	517
March	19.5	1.3	3.58	5.54	111	341
April	139	2.2	19.8	3.06	594	1,820
May	53	2.6	8.96	13.9	278	852
June	17	1.1	3.75	5.80	112	345
The year	220	1.1	8.30	12.8	3,030	9,300

KOOLAU DITCH AT NAHIKU WEIR, NEAR NAHIKU, MAUI

LOCATION.—Water-stage recorder between Kapaula and Waiohue Streams, 3½ miles southwest of Nahiku and 4 miles southeast of Keanae.

RECORDS AVAILABLE.—February, 1919, to June, 1931.

EXTREMES.—Maximum discharge during year, 57 million gallons a day or 88 second-feet Aug. 5 (gage height, 1.70 feet); no flow occasionally when water is shut out of ditch.

1919–1931: Maximum discharge, 58 million gallons a day or 90 second-feet Feb. 25 (gage height, 1.72 feet); no flow occasionally when intake gates are closed.

REMARKS.—Records excellent except those for extremely low stages and estimated periods, which are good. Regulated by spillways and gates. Koolau Ditch diverts water at elevation 1,200 feet from all streams from Makapipi to Alo.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	53	34	18.5	36	11.5	18.5	16.5	7.9	17.5	42	18	13.5
2	49	26	17.5	30	12	18	15	7.3	17.5	42	17.5	12.5
3	44	24	16.5	24	10.5	18.5	14	7.1	13.5	35	18.5	11.5
4	36	23	16	19	9.8	17	13	6.8	20	21	32	11
5	34	42	18	28	9.3	16.5	12.5	6.6	32	42	20	10.5
6	30	40	23	28	16.5	15.5	14	7.9	23	44	22	10.5
7	28	26	19.5	32	15.5	15.5	16.5	17	5.3	24	24	10
8	26	22	16	[a] 30	17	15.5	19	8.1	0	19	21	9.5
9	23	28	14.5		14	14	15.5	16.5	0	16.5	22	9.3
10	23	53	18		11	16	13	15.5	0	15.5	26	9.0
11	21	53	21	22	9.8	13.5	12.5	9.3	0	14	28	8.7
12	24	49	21		10.5	12.5	14	7.9	0	13	34	8.4
13	49	40	36		14	12.5	12.5	6.8	0	12.5	30	8.4
14	40	38	40		22	13	11	9.0	0	12.5	51	8.1
15	28	42	23	15	24	12.5	10.5	12	0	18	46	7.9
16	24	49	21		38	21	9.8	18	0	28	34	7.9
17	22	53	34		49	36	9.5	10.5	0	16	26	17
18	21	51	26		36	34	15.5	9.5	0	13.5	22	12.5
19	26	42	22		4.3	19.5	12	8.1	0	12.5	19.5	20
20	30	34	23	12	9.8	16.5	9.8	8.4	3.3	21	17.5	24
21	30	36	17		23	32	9.3	9.8	4.8	44	20	32
22	24	32	21		17.5	17	9.0	13	6.8	44	30	34
23	22	28	30	18	32	20	8.7	13	8.1	42	23	19.5
24	22	28	17.5		36	21	8.4	34	8.4	38	17	15
25	19	34	16		19.5	16.5	8.1	49	8.1	38	15.5	30
26	22	28	34	11	18	36	8.1	38	7.6	30	14	30
27	25	28	18.5		17.5	19	7.9	34	7.3	26	13	23
28	51	26	23	[b] 30	16	15.5	7.9	19	6.8	22	12.5	17.5
29	53	23	24	38	17	40	7.6	-------	6.8	20	32	15.5
30	51	21	26	18	19	26	7.3	-------	6.6	19	23	14
31	42	19.5	-------	13	-------	19	7.1	-------	16.5	-------	15	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	53	19	32.0	49.5	992	3,040
August	53	19.5	34.6	53.5	1,070	3,290
September	40	14.5	22.4	34.7	672	2,060
October	38	----------	20.1	31.1	624	1,910
November	49	4.3	18.7	28.9	560	1,720
December	40	12.5	19.9	30.8	618	1,890
January	19	7.1	11.5	17.8	356	1,090
February	49	6.6	14.6	22.6	410	1,250
Mar. 1–7, 20–31	32	3.3	11.6	17.9	220	676
April	44	12.5	26.2	40.5	785	2,410
May	51	12.5	24.0	37.1	744	2,280
June	34	7.9	15.4	23.8	461	1,420
The year (353 days)	53	3.3	21.3	33.0	7,510	23,000

[a] Partly estimated. [b] Estimated.

WAIOHUE STREAM NEAR NAHIKU, MAUI

LOCATION.—Water-stage recorder 200 feet above intake to Koolau Ditch, 300 feet above ditch trail, 2¼ miles southwest of Nahiku, and 3½ miles southeast of Keanae.

DRAINAGE AREA.—1.5 square miles.

RECORDS AVAILABLE.—October, 1921, to June, 1931.

EXTREMES.—Maximum discharge during year, 548 million gallons a day or 848 second-feet Nov. 18 (gage height, 5.75 feet); minimum, 2.4 million gallons a day or 3.7 second-feet Feb. 5.

1921–1931: Maximum discharge, 576 million gallons a day or 891 second-feet Dec. 18, 1929 (gage height, 5.94 feet); minimum, 1.7 million gallons a day or 2.6 second-feet Apr. 11, 1926.

REMARKS.—Records good for ordinary stages; poor for extremely high and low stages. No diversions.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	18	7.0	4.4	15	3.7	4.7	4.5	3.0	4.5	13.5	4.6	3.6
2	11	6.1	4.2	6.8	4.0	4.4	4.4	2.7	6.4	24	4.4	3.5
3	10.5	5.9	4.1	5.8	3.7	4.4	4.2	2.7	11.5	20	4.6	3.4
4	7.9	5.3	4.0	5.9	3.7	4.1	4.4	2.6	5.3	4.2	7.3	3.3
5	7.2	18.5	4.6	9.7	3.6	3.9	4.2	2.5	8.8	12	4.4	3.3
6	7.0	7.7	6.4	10.5	7.1	3.7	4.7	2.9	5.3	11.5	5.0	3.2
7	6.2	5.4	4.7	6.6	4.8	3.7	5.0	3.6	4.8	4.8	5.6	3.2
8	5.8	5.0	4.0	6.2	6.2	3.7	5.4	2.7	4.7	4.6	4.6	3.1
9	5.1	12.5	3.8	5.6	4.6	3.5	4.5	3.7	5.0	4.5	4.8	3.0
10	4.7	30	4.8	5.3	4.1	4.0	4.0	3.6	7.9	4.2	6.3	3.0
11	4.6	34	5.1	5.1	3.8	3.4	4.0	2.8	5.9	4.2	6.1	3.0
12	5.2	11.5	4.7	5.0	3.9	3.3	4.4	2.6	4.7	3.9	8.4	2.9
13	16.5	8.1	8.0	4.7	4.7	3.2	3.8	2.6	4.4	3.8	8.0	2.9
14	6.4	9.8	8.1	4.6	6.8	3.4	3.6	3.1	4.1	3.8	21	2.8
15	5.1	12	10.5	4.2	6.6	3.4	3.5	4.2	3.9	4.7	13	2.7
16	4.8	16	9.3	4.2	17.5	4.4	3.4	5.2	3.8	7.2	5.1	2.7
17	4.7	16.5	6.1	4.0	50	9.9	3.3	3.4	3.6	4.0	4.7	4.6
18	5.0	13.5	5.0	3.9	110	7.2	5.1	3.2	3.5	3.7	4.6	3.2
19	8.3	8.5	4.7	3.8	35	3.9	3.7	3.2	3.4	3.5	4.6	3.6
20	11.5	7.4	5.2	3.7	9.0	3.6	3.4	3.2	3.3	46	4.4	4.6
21	6.6	8.8	4.5	3.5	12.5	7.2	3.2	3.4	3.2	60	6.3	11
22	5.3	7.2	5.9	3.7	8.7	3.5	3.2	3.5	3.2	49	7.1	8.0
23	5.1	6.8	7.2	4.1	29	3.9	3.0	3.3	3.2	19.5	5.4	4.4
24	5.4	6.4	20	3.6	21	4.4	3.0	11.5	3.1	7.0	4.2	3.7
25	4.7	8.8	10.5	3.3	8.1	4.2	3.0	18.5	3.0	7.2	3.9	8.1
26	7.1	6.4	5.9	3.2	6.6	13.5	2.9	10	2.9	6.1	3.8	7.0
27	7.5	6.6	6.1	3.2	6.1	4.5	2.8	8.4	2.8	5.8	3.8	5.3
28	17.5	5.6	6.2	5.1	5.6	4.2	2.8	4.6	2.7	5.4	3.8	4.4
29	22	5.1	6.7	16	5.1	29	2.7	-------	2.8	5.1	22	4.1
30	17	4.7	7.4	4.7	4.8	5.3	2.7	-------	2.7	4.8	4.7	4.0
31	8.1	4.6	-------	3.9	-------	4.6	2.7	-------	6.4	-------	3.8	------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	22	4.6	8.45	13.1	262	804
August	34	4.6	10.1	15.6	312	961
September	20	3.8	6.40	9.90	192	589
October	16	3.2	5.64	8.73	175	537
November	110	3.6	13.3	20.6	400	1,220
December	29	3.2	5.49	8.49	170	522
January	5.4	2.7	3.73	5.77	116	355
February	18.5	2.5	4.52	6.99	127	388
March	11.5	2.7	4.54	7.02	141	432
April	60	3.5	11.9	18.4	358	1,100
May	22	3.8	6.46	10.0	200	615
June	11	2.7	4.19	6.48	126	386
The year	110	2.5	7.06	10.9	2,580	7,910

WEST KOPILIULA STREAM NEAR KEANAE, MAUI

LOCATION.—Water-stage recorder 600 feet above Koolau Ditch crossing and highway bridge and 3 miles southeast of Keanae post office.

DRAINAGE AREA.—3.9 square miles.

RECORDS AVAILABLE.—January, 1914, to September, 1917; October, 1921, to June, 1931.

EXTREMES.—Maximum discharge during year uncertain, owing to faulty record; minimum, 1.8 million gallons a day or 2.8 second-feet Jan. 28 to Feb. 6.

1914–1917, 1921–1931: Maximum discharge, about 2,000 million gallons a day or 3,090 second-feet Jan. 18, 1916 (gage height, 9.25 feet); minimum, 0.6 million gallons a day or 0.9 second-foot Sept. 15–17, 1917.

REMARKS.—Records good for ordinary stages; poor for estimated periods and high stages. No diversions.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	24	5.3	3.3	34	2.9		4.1	2.6	4.0	40	3.6	3.7
2	11.5	4.8	3.3	8.4	3.3		3.6	2.1	5.4	154	3.4	3.4
3	9.9	5.4	3.0	6.0	2.7	3.6	3.2	1.9	36	203	3.6	3.1
4	7.0	4.1	3.0	8.1	2.7		3.3	1.8	6.0	10.5	9.1	3.0
5	6.4	16.5	3.6	28	2.7		3.2	1.9	22	40	3.8	2.9
6	6.0	6.5	6.8	26	2.2		3.8	2.5	6.5	10	4.5	2.8
7	5.5	4.2	3.4	11.5	4.5		3.4	13.5	4.5	5.8	4.6	2.7
8	5.0	3.8	2.8	10.5	5.7		3.6	2.8	4.0	4.2	3.8	2.6
9	4.7	17	2.6	7.0	3.4		3.0	9.1	4.3	3.7	4.1	2.5
10	4.6	77	3.8	5.8	2.9		2.8	4.6	7.7	3.3	8.6	2.5
11	4.2	98	4.0	5.2	2.6	3.1	2.8	2.9	4.8	3.1	5.6	2.4
12	6.3	17.5	5.2	4.8	2.6		3.4	2.6	3.7	3.0	9.5	2.3
13	29	8.4	20	4.6	5.6		2.7	2.5	3.4	2.9	13	2.4
14	7.3	15.5	14.5	4.1	13.5		2.5	3.0	3.2	3.2	94	2.3
15	4.7	22	15.5	3.8	17		2.4	4.0	3.0	5.0	49	2.2
16	4.2	25	10	3.5	91		2.3	4.3	2.9	13	6.4	2.3
17	4.0	18.5	5.3	3.2	174	22	2.2	2.6	2.8	3.4	4.8	5.7
18	4.2	15	4.0	3.1	220		4.8	2.7	2.7	3.1	4.1	3.4
19	7.5	7.3	3.5	2.9		4.2	3.0	2.6	2.6	2.9	3.8	9.3
20	6.5	6.2	12	2.8			2.4	2.6	2.5	115	3.7	12
21	4.7	7.5	5.0	2.7	14	53	2.3	3.0	2.5	326	13.5	26
22	4.1	5.7	8.3	3.1		6.0	2.3	3.7	2.4	193	18.5	24
23	3.8	5.5	20	5.7	44	8.8	2.2	3.8	2.4	56	7.8	4.8
24	4.0	5.3	70	3.1		9.0	2.1	39	2.3	14.5	4.6	3.6
25	3.3	6.4	34	3.0	9.5	5.4	2.1	143	2.2	7.6	4.1	13
26	6.0	5.2	8.7	2.6		45	2.0	33	2.2	5.2	3.7	7.8
27	11	5.3	6.7	2.5		5.6	2.0	20	2.2	4.3	3.4	4.5
28	49	4.4	5.5	4.9	5	4.2	1.9	5.2	2.1	4.0	3.3	3.3
29	74	4.1	5.5	21		124	1.9	-------	2.1	3.8	96	3.2
30	16	3.6	5.2	3.6		11.5	1.8	-------	2.0	3.7	7.4	3.0
31	7.5	3.4	-------	2.8	-------	5.0	1.8	-------	13	-------	4.3	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	74	3.3	11.2	17.3	346	1,070
August	98	3.4	14.0	21.7	434	1,330
September	70	2.6	9.95	15.4	298	916
October	34	2.5	7.69	11.9	238	732
November	----------	2.2	31.6	48.9	948	2,910
December	124	----------	12.3	19.0	382	1,170
January	4.8	1.8	2.74	4.24	84.9	261
February	143	1.8	11.5	17.8	323	988
March	36	2.0	5.40	8.36	167	514
April	326	2.9	41.6	64.4	1,250	3,830
May	96	3.3	13.2	20.4	410	1,260
June	26	2.2	5.56	8.60	167	512
The year	326	1.8	13.8	21.4	5,050	15,500

EAST WAILUAIKI STREAM NEAR KEANAE, MAUI

LOCATION.—Water-stage recorder 1,000 feet above Koolau Ditch crossing and trail and 3 miles southeast of Keanae post office.

DRAINAGE AREA.—3.7 square miles.

RECORDS AVAILABLE.—December, 1913, to October, 1917; July, 1922, to June, 1931.

EXTREMES.—Maximum discharge during year, 1,680 million gallons a day or 2,600 second-feet Nov. 18 (gage height, 8.06 feet); minimum, 1.5 million gallons a day or 2.3 second-feet Feb. 5.

1913–1917, 1922–1931: Maximum discharge, 1,900 million gallons a day or 2,940 second-feet Jan. 18, 1916 (gage height, 8.35 feet); minimum, 1.0 million gallons a day or 1.6 second-feet Oct. 22, 23, 1917, Aug. 1, 2, 1922.

Flood of Dec. 24, 1921, may have reached a higher stage, but, owing to destruction of station, no data are available for this peak.

REMARKS.—Records good for ordinary stages; fair for estimated periods; and poor for high stages. No diversions.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	30	9.1	5.5	40	4.3	5.4	5.4	3.6	5.4	47	4.6	4.1
2	15	7.9	5.4	10.5	5.0	5.3	4.6	1.8	9.9	119	4.3	
3	12.5	8.5	5.0	8.5	4.3	5.4	4.4	1.7	40	176	4.6	
4	10.5	7.0	5.1	11.5	4.0	4.8	4.1	1.6	9.5	16	13	
5	9.8	21	5.5	31	4.3	4.3	4.2	1.5	24	40	5.7	
6	9.1	11	9.8	24	39	4.0	5.9	5.4	10.5	39	5.9	2.4
7	8.5	7.2	5.8	13.5	10.5	3.7	4.4	16	6.2	9.5	8.0	
8	7.7	6.5	4.7	12.5	8.7	3.8	4.8	2.8	5.0	6.2	5.4	
9	7.4	22	4.6	9.1	5.1	3.2	3.4	13.5	6.3	4.8	5.8	
10	7.1	88	5.9	7.5	4.8	4.6	3.0	6.7	11.5	4.0	10.5	2.
11	6.7	79	6.5	6.6	4.3	3.1	3.6	2.7	9.1	3.5	10	2.2
12	9.0	18.5	8.2	6.2	4.3	2.8	4.6	2.0	5.7	3.2	13.5	2.1
13	37	11	26	5.8	7.4	2.6	3.0	1.8	4.5	2.9	14	2.5
14	12	18.5	18	5.4	29	2.9	2.6	3.5	4.0	3.8	105	2.1
15	7.8	29	19	5.2	18.5	2.6	2.5	5.1	3.5	7.3	49	2.0
16	7.0	30	13.5	4.8	77	8.1	2.3	7.0	3.1	15	9.9	2.2
17	6.5	21	7.9	4.6	84	33	2.2	2.7	3.0	4.8	6.8	10
18	6.8	17.5	6.1	4.4	334	18.5	9.4	2.6	2.8	3.4	5.5	5.3
19	11	11	5.6	4.3	163	6.4	4.4	2.7	2.6	2.9	4.8	15.5
20	9.8	9.1	11.5	4.1	19	5.2	2.7	2.5	2.5	100	4.3	18.5
21	7.9	10.5	7.6	4.0	19	43	2.3	3.8	2.3	389	15.5	33
22	6.8	8.5	8.2	4.7	12.5	9.6	2.2	5.5	2.2	213	15	28
23	6.4	7.9	16.5	7.9	70	14	2.1	5.3	2.2	68		7.1
24	6.5	7.9	76	5.3	35	12	2.0	63	2.2	19.5		4.6
25	5.8	9.1	32	4.5	15	26	2.0	109	2.1	15		17.5
26	8.9	7.8	11	4.0	10	29	1.9	27	2.0	9.5	4.8	13
27	14	7.9	8.5	3.7	8.4	7.5	1.8	17.5	1.9	7.8		8.0
28	57	6.8	7.9	6.9	7.4	6.4	1.8	7.5	1.8	6.5		5.0
29	84	6.4	7.2	27	6.5	131	1.7	-------	1.8	5.8		4.3
30	20	6.1	7.6	6.7	5.9	12.5	1.7	-------	1.7	5.2	40	3.8
31	11	5.8	-------	4.7	-------	7.2	1.6	-------	11.5	-------		-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	84	5.8	14.8	22.9	460	1,410
August	88	5.8	16.7	25.8	518	1,590
September	76	4.6	12.1	18.7	362	1,110
October	40	3.7	9.64	14.9	299	917
November	334	4.0	34.0	52.6	1,020	3,130
December	131	2.6	13.8	21.4	428	1,310
January	9.4	1.6	3.31	5.12	103	315
February	109	1.5	11.6	17.9	326	997
March	40	1.7	6.48	10.0	201	616
April	389	2.9	44.9	69.5	1,350	4,130
May	----------	----------	15.5	24.0	480	1,470
June	33	2.0	7.19	11.1	216	662
The year	389	1.5	15.8	24.4	5,760	17,700

WEST WAILUAIKI STREAM NEAR KEANAE, MAUI

LOCATION.—Water-stage recorder 500 feet above Koolau Ditch crossing and trail bridge and 2¾ miles south of Keanae post office.

DRAINAGE AREA.—3.6 square miles.

RECORDS AVAILABLE.—January, 1914, to October, 1917; November, 1921, to June, 1931.

EXTREMES.—Maximum discharge during year, 2,360 million gallons a day or 3,650 second-feet Nov. 18 (gage height, 9.96 feet); minimum, 1.1 million gallons a day or 1.7 second-feet Mar. 31.

1914–1917, 1921–1931: Maximum discharge, estimated, 4,500 million gallons a day or 6,960 second-feet Jan. 14, 1923 (gage height from flood marks, about 13.5 feet); minimum, 0.3 million gallons a day or 0.45 second-foot July 26, 1922.

REMARKS.—Records good for ordinary stages; poor for extremely high stages and estimated period. No diversions.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	41	11	5.3	64	6.3	5.4	6.8	3.0	6.7	57	4.9	6.2
2	21	9.5	5.3	18	6.8	5.0	5.6	1.8	8.2	194	4.4	5.1
3	16	9.5	4.7	12.5	5.7	5.4	5.0	1.4	50	95	5.3	4.6
4	13	7.1	4.7	20	5.7	4.6	5.0	1.2	12	17	16	4.0
5	11	35	5.1	39	7.2	3.9	4.7	1.3	30	77	6.8	3.7
6	9.9	14	11	36	74	3.5	5.6	2.8	18.5	42	6.8	3.5
7	8.9	8.5	6.0	22	14.5	3.3	4.7	24	7.9	12	7.7	3.0
8	7.9	7.3	4.9	20	13.5	3.7	4.7	4.6	6.2	7.7	5.9	2.9
9	7.1	35	4.2	13	8.9	3.2	3.9	13.5	8.3	6.2	6.2	2.7
10	6.7	138	5.7	10	7.1	4.2	3.3	9.0	14	4.7	11.5	2.7
11	6.2	127	6.5	8.3	6.3	2.8	3.7	4.2	12	4.3	10.5	2.6
12	9.7	30	9.8	7.5	5.9	2.5	5.3	2.8	7.3	3.6	13.5	2.5
13	46	16	37	7.3	12.5	2.4	3.7	2.1	5.6	3.3	15	3.3
14	18.5	24	30	6.2	51	2.6	2.9	3.0	4.6	4.2	123	2.6
15	10	39	26	5.7	32	2.2	2.7	5.3	4.0	7.5	61	2.2
16	7.7	41	18	5.3	123	7.1	2.4	9.4	3.6	18	15	2.6
17	6.8	28	11.5	4.7	202	34	2.2	2.9	3.2	5.6	9.5	11.5
18	7.0	25	8.1	4.4	712	22	9.3	3.3	2.9	4.2	7.1	8.3
19	12	16	7.0	4.2	293	7.9	6.4	2.9	2.7	3.2	6.3	20
20	9.9	12	17	3.9	25	6.0	3.3	2.7	2.4	245	5.6	22
21	8.1	13.5	9.9	3.6	21	54	2.7	3.7	2.1	487	18.5	36
22	6.7	9.9	10.5	4.9	13.5	12	2.4	6.0	2.0		24	30
23	6.0	9.5	28	12.5	82	16	2.1	7.1	1.9	110	14.5	9.9
24	6.2	8.9	109	7.3	84	15	2.0	53	1.7		7.3	7.0
25	5.1	10.5	47	5.7	19	8.3	1.8	126	1.6	18.5	5.7	18.5
26	8.2	8.5	18	4.4	12	52	1.7	30	1.5	11.5	5.0	15
27	16.5	8.9	12.5	3.7	9.3	10	1.6	20	1.4	8.9	4.6	9.9
28	83	7.1	10.5	7.1	7.7	6.7	1.5	9.5	1.3	7.1	4.3	6.7
29	122	6.5	9.7	40	6.7	155	1.4	-------	1.4	6.2	105	5.7
30	101	6.2	9.3	10.5	5.9	19	1.4	-------	1.2	5.4	16.5	5.0
31	18.5	5.7	-------	6.5	-------	9.7	1.2	-------	13.5	-------	7.9	------

Month	Million gallons a day			Second-feet (mean	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	122	5.1	21.2	32.8	658	2,020
August	138	5.7	23.5	36.4	728	2,240
September	109	4.2	16.4	25.4	492	1,510
October	64	3.6	13.5	20.9	418	1,280
November	712	5.7	62.4	96.5	1,870	5,740
December	155	2.2	15.8	24.4	489	1,500
January	9.3	1.2	3.58	5.54	111	341
February	126	1.2	12.7	19.6	356	1,090
March	50	1.2	7.73	12.0	240	735
April	487	3.2	56.2	87.0	1,690	5,170
May	123	4.3	17.9	27.7	1,555	1,700
June	36	2.2	8.66	13.4	260	797
The year	712	1.2	21.6	33.4	7,870	24,100

EAST WAILUANUI STREAM NEAR KEANAE, MAUI

LOCATION.—Water-stage recorder 125 feet above Koolau Ditch intake, 250 feet above trail, and 2½ miles south of Keanae post office.

DRAINAGE AREA.—0.5 square mile.

RECORDS AVAILABLE.—January, 1914, to October, 1917; November, 1921, to June, 1931.

EXTREMES.—Maximum discharge during year, 775 million gallons a day or 1,200 second-feet Nov. 18 (gage height, 5.60 feet); minimum, 0.5 million gallons a day or 0.8 second-foot Jan. 31.

1914–1917, 1921–1931: Maximum discharge, 1,050 million gallons a day or 1,620 second-feet Feb. 12, 1925 (gage height, 6.96 feet); minimum, 0.1 million gallons a day or 0.2 second-foot Apr. 11, 1926.

REMARKS.—Records good for ordinary stages and estimated periods; poor for high stages. No diversions.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	14	4.6	1.7	17	1.4	1.6	1.8	1.2	2.2	17	1.7	1.5
2		3.4	1.6	4.2	1.7	1.5	1.6	.8	3.2	16	1.7	1.3
3		3.4	1.5	3.6	1.4	1.5	1.5	.7	7.6	6.5	1.7	1.1
4	5.5	3.6	1.6	3.5	1.3	1.3	1.5	.7	3.4	3.6	5.1	1.0
5		13.5	1.8	9.0	1.1	1.1	1.5	.6	8.7	12	1.7	1.0
6		5.6	4.5	7.3	21	1.1	2.1	1.6	3.6	14.5	2.8	1.0
7		3.7	2.4	4.1	3.6	1.1	2.0	3.0	2.0	3.7	4.2	.9
8		3.4	1.5	3.8	5.6	1.3	2.0	.8	1.8	2.9	3.4	.8
9	2.5	13	1.5	2.9	3.4	1.1	1.6	3.4	3.4	1.8	3.6	.8
10		35	2.4	2.2	1.8	1.9	1.3	2.7	6.0	1.6	6.0	.8
11		41	3.2	2.0	1.6	1.0	1.4	1.1	3.7	1.6	4.6	.8
12		8.6	4.1	1.8	1.4	.9	1.7	.9	2.2	1.4	7.3	.8
13	9.5	5.3	8.2	1.6	3.4	.8	1.3	.8	2.0	1.4	8.0	1.0
14		9.0	7.8	1.5	5.0	1.0	1.1	1.3	1.7	1.4	18.5	.9
15		10.5	9.9	1.4	5.8	.9	1.0	3.7	1.6	2.8	9.4	.9
16	2.4	17	7.1	1.3	14.5	2.9	1.0	3.9	1.5	6.2	3.5	1.0
17		13	3.5	1.1	63	8.5	1.0	1.5	1.4	1.7	3.6	5.1
18		11	3.4	1.1	118	6.2	4.3	1.4	1.3	1.4	2.2	2.9
19	5	5.6	2.2	1.0	20	2.2	1.3	1.3	1.3	1.3	2.0	4.1
20		3.8	4.3	1.0	4.5	1.7	1.0	1.3	1.1	44	1.8	5.8
21		4.6	2.0	1.0	3.4	3.7	1.0	1.7	1.0	68	2.0	12
22		3.5	4.4	1.3	3.8	1.7	.9	2.9	.9	58	4.4	6.4
23	2.0	3.7	6.4	3.0	28	2.2	.8	1.7	.9	20	3.1	3.6
24		3.7	28	1.4	21	2.9	.8	9.7	.8	5.1	1.7	2.0
25		4.1	11.5	1.3	5.1	1.8	.8	9.3	.8	4.4	1.6	9.3
26	4.4	3.7	4.2	1.0	3.5	8.8	.8	7.2	.8	3.6	1.5	5.5
27	9.4	3.9	3.4	.9	3.4	2.2	.8	7.3	.8	2.9	1.5	3.4
28	29	3.4	3.7	6.5	2.2	1.7	.8	3.4	.7	2.2	1.4	2.2
29	29	2.2	3.3	17.5	1.8	28	.7	-------	.7	2.0	10.5	1.8
30	22	2.0	3.7	2.9	1.7	3.7	.7	-------	.7	1.8	2.2	1.8
31	6.7	1.8	-------	1.6	-------	2.2	.6	-------	7.6	-------	1.6	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	29	----------	7.04	10.9	218	670
August	41	1.8	8.08	12.5	251	769
September	28	1.5	4.83	7.47	145	445
October	17.5	.9	3.54	5.48	110	337
November	118	1.1	11.8	18.3	353	1,090
December	28	.8	3.18	4.92	98.5	303
January	4.3	.6	1.31	2.03	40.7	125
February	9.7	.6	2.71	4.19	75.9	233
March	8.7	.7	2.43	3.76	75.4	231
April	68	1.3	10.4	16.1	311	957
May	18.5	1.4	4.01	6.20	124	381
June	12	.8	2.72	4.21	81.5	250
The year	118	.6	5.16	7.98	1,880	5,790

WEST WAILUANUI STREAM NEAR KEANAE, MAUI

LOCATION.—Water-stage recorder 150 feet above Koolau Ditch crossing and intake and 2¼ miles south of Keanae post office.

DRAINAGE AREA.—0.7 square mile.

RECORDS AVAILABLE.—December, 1913, to October, 1917; July, 1922, to June, 1931.

EXTREMES.—Maximum discharge during year, 732 million gallons a day or 1,130 second-feet Nov. 18 (gage height, 5.69 feet); minimum, 0.8 million gallons a day or 1.2 second-feet June 15.

1913–1917, 1922–1931: Maximum discharge, 1,220 million gallons a day or 1,890 second-feet Jan. 14, 1923 (gage height, 7.70 feet); minimum, 0.2 million gallons a day or 0.3 second-foot July 16–21, 1922.

REMARKS.—Records fair for ordinary stages; poor for estimated periods and extremely high stages. No diversions.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	19	5.1	1.8	19	1.8	2.6	2.6	1.8	2.8	24	2.1	2.2
2	9.8	4.0	1.8	7.7	2.3	[a] 2.5	2.2	1.2	3.8	71	1.9	1.7
3	7.8	4.0	1.8	5.2	1.7	[b] 2.1	1.7	.9	18	86	2.4	1.4
4	[a] 6.0	2.9	1.9	10.5	1.7	[b] 2.1	1.7	.8	5.0	12	6.7	1.4
5	[a] 4.6	13	[a] 2.5	14	1.7	[b] 1.8	1.5	.9	13.5	21	1.4	1.3
6	[a] 3.6	5.2	[a] 7.3	14	25	[b] 1.7	2.2	2.3	5.9	19.5	3.3	1.2
7	[a] 3.2	2.9	[a] 3.6	8.1	4.6	[b] 1.6	1.7	11	3.2	5.7	4.2	1.2
8	2.8	2.5	2.4	7.0	7.0	[b] 1.4	1.8	2.0	2.6	3.4	2.8	1.1
9	2.5	12	1.5	4.8	3.1		1.4	5.6	3.6	2.5	3.1	.9
10	2.4	39	2.5	3.6	2.5		1.4	3.8	8.2	1.9	6.0	.9
11	2.2	36	2.7	3.1	2.1		1.5	1.7	5.8	1.6	5.3	.9
12	4.9	10.5	4.1	2.8	1.9	1.6	2.2	1.4	3.2	1.4	7.4	.8
13	21	6.5	10.5	2.6	4.4		1.4	1.3	2.6	1.3	8.8	1.1
14	6.0	12	10.5	2.5	15		1.3	1.9	2.2	1.5	37	.8
15	3.2	12.5	11.5	2.2	12.5		1.2	4.0	1.9	3.2	27	.8
16	2.5	17.5	7.6	2.2	43		1.2	5.2	1.8	6.4	7.5	.8
17	2.2	14	4.4	2.1	81	10	1.1	1.8	1.7	1.7	4.4	6.0
18	2.5	12	3.1	2.1	161		5.7	1.7	1.6	1.4	3.2	2.4
19	6.4	6.2	2.8	[a] 2.2	85	[a] 2.6	1.8	1.7	1.5	1.2	2.6	5.1
20	4.4	4.8	11	[a] 1.2	14.5	2.2	1.4	1.4	1.4	66	2.2	7.4
21	3.1	6.0	4.4	1.1	9.1	31	1.3	1.9	1.4	145	4.5	12
22	2.5	[a] 4.4	5.1	1.7	6.0	7.3	1.1	2.5	1.3	88	9.4	11
23	2.2	3.2	9.1	3.8	33	9.1	.9	1.7	1.3	36	5.6	3.8
24	2.5	3.1	34	1.9	25	6.5	.9	16	1.2	14	2.6	2.6
25	1.9	4.0	17	1.5	8.5	3.1	.9	41	1.1	9.9	2.1	10.5
26	[a] 4.3	3.2	7.0	1.2	5.5	22	.8	13.5	1.1	5.5	1.7	7.1
27	7.7	3.5	5.2	1.0	4.0	4.4	.8	10.5	1.0	4.0	1.5	3.8
28	28	2.5	4.4	3.5	3.4	2.5	.8	4.0	.9	3.2	1.5	2.5
29	37	2.4	4.4	19.5	2.9	55	.8	-------	.9	2.8	26	2.2
30	24	2.1	4.2	3.0	2.8	11	.8	-------	.8	2.4	6.2	1.8
31	7.6	1.9	-------	1.9	-------	4.2	.8	-------	9.9	-------	2.9	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	37	1.9	7.67	11.9	238	730
August	39	1.9	8.35	12.9	259	794
September	34	1.5	6.34	9.81	190	584
October	19.5	1.0	5.06	7.83	157	481
November	161	1.7	19.1	29.6	572	1,760
December	55	-------	6.76	10.5	210	643
January	5.7	.8	1.51	2.34	46.9	144
February	41	.8	5.12	7.92	144	440
March	18	.8	3.59	5.55	111	342
April	145	1.2	21.4	33.1	644	1,970
May	37	1.4	6.56	10.1	203	624
June	12	.8	3.22	4.98	96.7	296
The year	161	.8	7.86	12.2	2,870	8,810

[a] Partly estimated. [b] Estimated.

KOOLAU DITCH NEAR KEANAE, MAUI

LOCATION.—Water-stage recorder on west side of Keanae Valley, 2¾ miles southwest of Keanae post office.

RECORDS AVAILABLE.—January, 1910, to December, 1912; November, 1917, to June, 1931.

EXTREMES.—Maximum discharge during year, 158 million gallons a day or 244 second-feet Apr. 22 (gage height, 5.45 feet); no flow occasionally when water is shut out of ditch.

1910–1912, 1917–1931: Maximum discharge, 175 million gallons a day or 271 second-feet Jan. 4, 1922 (gage height, 6.36 feet); no flow occasionally when water is shut out of ditch.

REMARKS.—Records excellent for ordinary stages; good for estimated periods; fair for high stages. Regulated by gates and spillways. Koolau Ditch diverts water at 1,200 feet elevation from all streams from Makapipi to Alo. No diversions from ditch above station except from several spillways.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	137	97	48	103	38	0	57	28	57	136	50	47
2	134	81	45	104	48	0	50	22	72	144	47	
3	127	81	42	78	35	23	44	18.5	133	142	57	
4	104	66	42	84	35	47	44	18.5	80	104	110	
5	97	112	51	94	34	44	41	18.5	118	134	57	34
6	84	104	81	114	96	41	54	30	87	148	70	
7	75	72	57	107	60	38	54	80	7.8	93	80	
8	69	60	42	104	83	41	60	30	0	66	63	
9	63	76	38	78	51	36	44	77	0	57	66	27
10	60	137	57	66	39	50	36	63	0	47	97	27
11	57	137	63	60	36	35	38	32	0	44	97	26
12	79	134	75	54	35	33	50	26	0	41	104	24
13	134	114	130	51	71	32	36	22	0	36	104	27
14	104	120	127	45	119	34	33	33	0	41	148	24
15	75	137	124	42	117	33	30	54	0	69	133	22
16	63	137	104	39	137	73	3.3	66	0	100	104	24
17	57	137	91	38	140	110	0	34	0	54	76	88
18	63	134	66	36	105	118	0	33	0	41	66	54
19	104	114	57	34	32	60	0	30	0	36	57	97
20	94	94	82	32	46	50	0	30	0	67	54	114
21	81	107	60	31	57	122	0	38	0	152	79	106
22	66	87	67	38	42	73	0	54	0	156	133	109
23	60	78	107	72	101	90	8.4	50	20	156	83	70
24	63	78	130	42	34	90	24	110	22	140	57	50
25	51	97	124	36	0	63	22	140	21	125	50	111
26	79	78	107	31	0	123	22	136	21	93	44	112
27	81	81	78	28	0	70	21	124	20	76	41	80
28	134	66	78	80	0	54	20	73	20	66	41	57
29	137	60	75	120	0	108	20	-------	20	60	102	50
30	130	54	81	54	0	87	20	-------	18.5	57	80	44
31	110	51	-------	39	-------	70	18.5	-------	51	-------	54	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	137	51	89.4	138	2,770	8,510
August	137	51	96.2	149	2,980	9,150
September	130	38	77.6	120	2,330	7,140
October	120	28	62.4	96.5	1,930	5,940
November 1–24	140	32	66.3	103	1,590	4,880
December 3–31	123	23	63.7	98.6	1,850	5,670
January 1–16, 23–31	60	3.3	34.0	52.6	850	2,610
February	140	18.5	52.5	81.2	1,470	4,510
March 1–7, 23–31	133	7.8	48.0	74.3	768	2,360
April	156	36	89.4	138	2,680	8,230
May	148	41	77.5	120	2,400	7,370
June	114	22	54.3	84.0	1,630	5,000
The year (336 days)	156	3.3	69.2	107	23,200	71,400

HONOMANU STREAM NEAR KEANAE, MAUI

LOCATION.—Water-stage recorder 500 feet above Spreckels Ditch intake and trail bridge and 3 miles by trail northwest of Upper Keanae.

DRAINAGE AREA.—3.3 square miles.

RECORDS AVAILABLE.—November, 1913, to June, 1931.

EXTREMES.—Maximum discharge during year, 940 million gallons a day or 1,450 second-feet Nov. 19 (gage height, 7.58 feet); minimum, 0.5 million gallons a day or 0.8 second-foot Feb. 4.

1913–1931: Maximum discharge, 1,270 million gallons a day or 1,960 second-feet Dec. 18, 1929 (gage height, 9.25 feet); minimum, 0.08 million gallons a day or 0.12 second-foot Mar. 24, 1928.

REMARKS.—Records good except those for high stages, which are poor. No diversions.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	29	7.4	3.0	29	3.2	4.1	3.4	1.2	3.8	48	1.0	3.3
2	12.5	6.3	3.0	18.5	4.0	3.8	2.9	.9	8.5	59	.9	2.7
3	9.0	6.8	2.7	8.8	3.4	4.8	2.6	.6	38	114	1.6	2.3
4	8.0	5.2	3.1	25	2.6	4.0	2.7	.5	7.3	11.5	9.6	2.0
5	6.3	9.9	2.9	22	2.5	3.3	2.6	.6	33	38	2.4	1.8
6	30	8.7	12.5	23	70	3.0	3.7	5.0	10.5	32	2.8	1.7
7	10.5	5.0	22	15	11.5	2.9	2.9	25	4.6	8.8	4.3	1.8
8	6.3	4.3	6.8	15.5	11	3.4	3.0	3.0	3.6	4.8	3.1	1.6
9	5.4	21	3.8	9.3	6.4	2.9	3.7	13	6.6	3.6	4.2	1.6
10	4.8	81	5.2	6.6	5.4	5.7	2.3	6.0	24	2.9	7.2	3.2
11	4.5	31	6.3	5.0	4.0	3.8	2.1	2.6	11	2.6	7.4	3.0
12	12.5	16	9.9	13.5	3.4	2.7	3.6	1.7	5.2	2.3	9.4	2.0
13	42	9.5	32	6.2	12	2.4	2.6	1.3	3.8	2.1	13.5	3.2
14	19	22	17.5	4.3	41	2.4	1.8	1.8	3.1	2.7	94	2.3
15	8.7	31	13.5	3.8	27	2.1	1.5	3.0	2.7	6.1	32	1.4
16	5.6	31	8.1	3.6	76	7.7	1.4	4.9	2.4	11.5	6.0	1.3
17	4.6	14.5	5.8	3.2	86	39	1.3	2.2	2.2	4.7	2.8	20
18	4.9	14	9.6	3.0	241	17.5	13	2.4	2.1	3.1	2.1	8.9
19	11	9.8	7.1	2.8	184	6.1	6.3	2.5	1.8	2.5	1.6	15
20	7.1	6.4	26	2.6	32	4.8	2.2	2.1	1.7	52	1.4	16.5
21	5.5	6.8	8.3	2.7	15.5	50	1.5	2.7	1.6	226	1.2	28
22	4.8	5.8	8.3	6.1	9.8	11	1.3	4.8	1.4	[a]154	5.7	23
23	4.3	5.2	30	22	47	13	1.1	4.8	1.4	[a]52	9.8	6.4
24	5.2	5.0	71	6.1	31	9.8	1.0	42	1.3	12	3.7	4.3
25	5.3	5.2	30	4.0	11	5.2	.9	84	1.1	9.4	2.9	16
26	8.4	5.5	10	3.1	7.8	34	.8	17.5	1.1	3.0	2.6	11.5
27	17	6.2	6.6	2.5	6.6	6.3	.8	11	1.0	2.1	2.3	6.1
28	75	4.9	6.0	6.1	5.6	4.1	.7	5.2	.9	1.7	2.1	4.2
29	84	4.0	5.0	34	5.0	81	.7	-------	1.0	3.1	55	3.4
30	17.5	3.8	5.8	7.1	4.5	11.5	.7	-------	.9	1.1	8.7	2.8
31	10	3.6	-------	3.7	-------	5.0	.7	-------	14.5	-------	4.1	------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	84	4.3	15.4	23.8	479	1,470
August	81	3.6	12.8	19.8	397	1,220
September	71	2.7	12.7	19.6	382	1,170
October	34	2.5	10.3	15.9	318	980
November	241	2.5	32.3	50.0	970	2,970
December	81	2.1	11.5	17.8	357	1,090
January	13	.7	2.45	3.79	75.8	233
February	84	.5	9.01	13.9	252	774
March	38	.9	6.52	10.1	202	620
April	226	1.1	29.2	45.2	877	2,690
May	94	.9	9.85	15.2	305	937
June	28	1.3	6.71	10.4	201	618
The year	241	.5	13.2	20.4	4,820	14,800

[a] Partly estimated.

HAIPUAENA STREAM NEAR HUELO, MAUI

LOCATION.—Water-stage recorder 200 feet above inflow of Spreckels Ditch and 3¼ miles southeast of Kailua.

DRAINAGE AREA.—1.1 square miles.

RECORDS AVAILABLE.—October, 1913, to June, 1931.

EXTREMES.—Maximum discharge during year, 406 million gallons a day or 628 second-feet Nov. 6 (gage height, 5.12 feet); minimum, 1.2 million gallons a day or 1.9 second-feet June 16.

1913–1931: Maximum discharge, 582 million gallons a day or 900 second-feet Feb. 17, 1929 (gage height, 6.25 feet); minimum, 0.3 million gallons a day or 0.5 second-foot frequently during December, 1919.

REMARKS.—Records fair for ordinary stages and estimated periods; poor for extremely high stages. No diversions.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	20	7.6	2.6		3.2	2.8	2.9	2.0	3.3	40	2.7	2.6
2		6.1	2.6		3.9	2.5	2.5	1.7	6.8	41	2.6	2.2
3		6.6	2.4		3.3	3.1	2.2	1.5	24	60	3.4	1.9
4	7.5	[a] 4.6	2.5		2.8	2.7	2.2	1.5	5.6	7.5	11	1.7
5		10	2.9	19	2.6	2.2	2.2	1.5	22	32	3.7	1.6
6	15	8.0	8.4		49	2.0	2.9	3.3	7.5	31	3.8	1.6
7		4.5	11.5		8.2	2.0	2.4	19.5	4.0	6.9	6.2	1.5
8		3.6	5.3		8.5	2.4	2.2	3.2	3.5	4.1	4.2	1.4
9		12.5	3.0		5.2	1.8	2.8	11.5	4.6	3.0	5.3	1.3
10	4.6	63	5.3	8	4.1	3.0	1.7	6.4	17	2.4	7.6	1.8
11		29	6.5		3.0	2.2	1.7	2.9	9.0	2.1	8.8	1.8
12		13.5			2.7	1.7	2.7	2.3	4.4	1.9	11	1.5
13	15	8.6			8.1	1.6	2.0	2.1	3.5	1.6	11.5	1.9
14		16.5	20	4.3	24	1.7	1.5	3.0	2.9	2.0	77	1.7
15		22			15	1.5	1.4	5.0	2.7	3.9	30	1.3
16	5.5	27			49	4.2	1.4	5.5	2.5	7.6	7.2	1.3
17		17	9		64	25	1.3	2.8	2.4	2.8	4.5	12.5
18		14			131	13	8.6	2.5	2.2	2.0	3.4	5.8
19	9	9.9		2.4	87	4.4	4.5	2.6	2.2	1.6	3.0	10
20		6.7			14.5	3.0	2.0	2.0	2.1	56	2.7	12.5
21	5.5	7.4	15		8.5	23	1.7	2.4	2.0	112	2.5	25
22		[a] 5.9			6.2	5.8	1.6	3.5	2.0	95	5.0	17.5
23	3.6	4.8		11	35	6.4	1.5	3.2	2.0	38	6.8	5.2
24	4.2	4.5	40		28	5.8	1.5	30	2.0	9.6	2.9	3.5
25	3.7	5.2		[a] 3.1	8.6	3.6	1.4	46	2.0	8.9	2.4	13.5
26	8.4	4.6		2.4	6.2	19	1.4	11.5	1.9	4.3	2.2	9.5
27	15	5.2		2.2	4.7	4.1	1.4	9.8	1.8	3.5	1.9	5.2
28	59	4.1	7	4.9	4.0	2.8	1.4	4.4	1.7	3.2	1.8	3.5
29	60	[a] 4.2		25	3.4	52	1.4	-------	1.9	3.1	39	2.9
30	21	[a] 3.4		6.7	3.0	7.4	1.4	-------	1.8	3.0	7.1	2.5
31	11	2.9	-------	3.6	-------	3.9	1.4	-------	15.5	-------	3.1	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	60	----------	12.7	19.6	393	1,210
August	63	2.9	11.1	17.2	343	1,060
September	----------	2.4	11.8	18.3	356	1,090
October	----------	----------	9.15	14.2	284	870
November	131	2.6	19.9	30.8	597	1,830
December	52	1.5	6.99	10.8	217	665
January	8.6	1.3	2.17	3.36	67.2	206
February	46	1.5	6.91	10.7	194	594
March	24	1.7	5.38	8.32	167	512
April	112	1.6	19.7	30.5	590	1,810
May	77	1.8	9.17	14.2	284	872
June	25	1.3	5.21	8.06	156	480
The year	131	1.3	9.99	15.5	3,650	11,200

[a] Partly estimated.

SPRECKELS DITCH AT HAIPUAENA, NEAR HUELO, MAUI

LOCATION.—Water-stage recorder between Haipuaena and Puohokamoa Streams on Spreckels Ditch trail, 3½ miles southeast of Kailua.

RECORDS AVAILABLE.—February, 1930, to June, 1931.

EXTREMES.—Maximum discharge during year, 62 millions gallons a day or 96 second-feet Nov. 18 (gage height, 4.58 feet); no flow July 10, Nov. 18, 19, when water was shut out of ditch.

1930–31: Maximum discharge, that of Nov. 18, 1930; minimum, that of July 10, Nov. 18, 19, 1930.

REMARKS.—Records good except those for estimated periods, which are poor. Regulated by gates and spillways. Spreckels Ditch diverts from all streams between Nuaailua and Kailua above Koolau Ditch east of Puohokamoa and below Koolau Ditch west of Puohokamoa.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	28	19	8.9		9.2		9.4	19	13	28	7.9	9.0
2	22	18	8.7		12	9	8.1	5.0		25	7.6	7.4
3	20	18	7.8		9.8		7.4	3.8		24	11	6.4
4	18	15	8.9	24	7.8		7.4	3.5		18	27	5.7
5	17	21	11		7.4		9.0	3.7	20	24	13	5.2
6	22	19	17		12		12	8.1		21	14	5.2
7	19	15	19		16		8.3	27		14	25	5.4
8	14	12.5	14		19		9.4	10	13.5	11	17	4.7
9	12	17	10	18	16	6	8.5	25	20	8.5	21	5.6
10	6.3	32	16		13.5		5.9	21	28	6.7	22	10.5
11	11	28	16	14	10.5		7.1	9.6	26	6.1	28	10.5
12	16.5	24	20	16	8.7		11.5	7.8	17	5.2	27	5.6
13	32	20	27	15	18	4.7	6.4	6.2	13	4.7	22	9.0
14	24	24	25	11	25	7.2	5.2	14	11	6.9	39	5.4
15	18	27	24	9.4	24	5.6	4.9	24	9.8	13	29	3.5
16	14	29	20	8.5	29	15	4.7	19	9.2	17	24	4.2
17	12	26	[a] 17	7.9	29	22	4.5	12	10.5	9.6	16	25
18	13.5	25		7.4	15	18	20	11	9.4	7.4	13	20
19	25	21		6.9	7.0	12	13	11	8.7	6.2	11	27
20	19	17		6.6		10	6.7	9.6	7.9	18	9.8	28
21	16	19		6.6	5.5	25	5.9	13	6.2	22	8.9	29
22	14	17		9.6		18	6.1	17	3.8	36	21	28
23	13	15	24	22		19	6.7	15	4.2	28	20	18
24	15	15		15	24	18	5.0	29	3.3	24	10	12.5
25	13	17		10		14	4.4	28	3.2	25	8.1	25
26	20	15		7.8		20	4.4	25	2.8	17	7.2	26
27	23	16		6.6		12	4.2	15	2.8	13	6.4	19
28	36	13.5		12	14	9.8	3.8		2.6	11	5.9	12
29	33	11.5	14	26		15.5	3.8	-------	3.2	9.8	24	10.5
30	26	11.5		15		17	3.7	-------	2.4	8.7	18	8.7
31	22	10.5	-------	10.5	-------	11.5	3.7	-------	14.5	-------	10.5	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	36	6.3	19.2	29.7	594	1,830
August	32	10.5	19.0	29.4	588	1,810
September	----------	7.8	18.4	28.5	552	1,690
October	----------	6.6	15.0	23.2	466	1,430
November	----------	----------	14.9	23.1	447	1,370
December	25	4.7	11.6	17.9	358	1,100
January	20	3.7	7.13	11.0	221	678
February	29	3.5	14.5	22.4	407	1,250
March	28	2.4	11.6	17.9	359	1,100
April	36	4.7	15.6	24.1	469	1,440
May	39	5.9	16.9	26.1	524	1,610
June	29	3.5	13.1	20.3	392	1,210
The year	39	2.4	14.7	22.7	5,380	16,500

[a] Partly estimated.

PUOHOKAMOA STREAM NEAR HUELO, MAUI

LOCATION.—Water-stage recorder just above Spreckels Ditch inflow and trail crossing and 3 miles southeast of Kailua.

DRAINAGE AREA.—2.6 square miles.

RECORDS AVAILABLE.—December, 1910, to June, 1931.

EXTREMES.—Maximum discharge during year, 1,100 million gallons a day or 1,700 second-feet Nov. 18 (gage height, 7.88 feet); minimum, 1.6 million gallons a day or 2.5 second-feet Feb. 6.

1910–1931: Maximum discharge, 1,100 million gallons a day or 1,700 second-feet Jan. 14, 1923, Nov. 18, 1930 (gage height, 7.88 feet); minimum, 0.1 million gallons a day or 0.2 second-foot Nov. 17, 1929.

REMARKS.—Records good for ordinary stages and estimated period; poor for high stages. Kula pipe line diverts small amounts of water above station at elevation 4,300 feet.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	50	15	5.6	44	4.9	7.9	7.0	3.1	7.6	56	5.0	5.3
2	24	11.5	5.7	26	5.7	7.1	6.1	2.3	14	56	4.6	4.4
3	17	11.5	4.9	14	4.9	8.1	5.5	1.9	35	77	6.0	3.8
4	13.5	9.1	4.8	24	3.9	6.8	5.5	1.7	11	11.5	17	3.5
5	11.5	22	5.8	32	3.7	6.0	5.4	1.7	34	56	6.5	3.1
6	28	17	16	41	78	5.4	7.1	3.4	13.5	56	7.4	3.0
7	13.5	9.2	16.5	17	14	5.2	5.6	24	8.2	12.5	11.5	2.8
8	9.8	7.2	9.5	22	17	6.1	5.5	4.2	6.8	7.9	7.8	2.6
9	8.6	34	6.6	14	10	4.9	5.5	16.5	7.9	6.1	9.4	2.6
10	8.2	132	9.4	11	7.8	7.1	4.2	9.6	26	4.9	15.5	2.8
11	6.9	56	11	8.9	6.1	5.2	4.4	4.0	14	4.5	17	2.6
12	13	20	18	10	5.4	4.3	6.0	2.8	7.8	4.0	20	2.4
13	60	[a] 16	52	8.9	13.5	4.0	4.3	2.4	6.1	3.7	22	3.3
14	18	23	29	7.6	40	4.5	3.5	3.6	5.2	4.2	127	2.6
15	11	56	28	6.6	25	3.9	3.2	7.2	4.6	8.3	46	2.1
16	8.6	45	16	6.1	180	9.5	2.9	9.4	4.2	15	13.5	2.2
17	7.2	16	12	5.6	151	41	2.8	4.4	4.0	5.6	9.7	22
18	7.8		12	4.4	294	23	15.5	4.3	3.6	4.3	7.8	11
19	24	14	11	4.1	150	9.1	8.5	4.1	3.3	3.6	6.6	19
20	13.5		21	3.8	26	6.8	3.8	3.7	3.0	94	5.9	22
21	10		10.5	3.8	17	30	3.2	4.8	2.7	219	5.2	43
22	8.6	11	15	6.4	13.5	9.5	2.8	6.7	2.6	200	10.5	32
23	8.1		35	20	70	9.9	2.6	6.0	2.6	71	12	11.5
24	8.8	8.8	137	7.3	46	10.5	2.4	42	2.4	22	5.4	7.9
25	7.8	11	58	5.3	17	7.1	2.4	74	2.2	21	4.6	37
26	15	10	18.5	4.2	13.5	25	2.2	22	2.1	11	4.0	19
27	38	10	14	3.6	11.5	8.1	2.1	21	2.1	8.8	3.6	11.5
28	140	8.1	12	7.8	10.5	6.0	2.0	10	1.9	7.9	3.3	7.8
29	131	6.6	11	40	9.2	85	2.0	-------	2.2	6.8	71	6.8
30	48	8.2	13	9.7	8.5	12.5	2.0	-------	2.0	6.0	11.5	6.0
31	21	6.2	-------	5.4	-------	8.3	2.0	-------	23	-------	6.3	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	140	6.9	25.5	39.5	790	2,430
August	132	6.2	20.8	32.2	644	1,980
September	137	4.8	20.6	31.9	619	1,900
October	44	3.6	13.7	21.2	424	1,300
November	294	3.7	41.9	64.8	1,260	3,860
December	85	3.9	12.5	19.3	388	1,190
January	15.5	2.0	4.45	6.89	138	423
February	74	1.7	10.7	16.6	301	919
March	35	1.9	8.57	13.3	266	815
April	219	3.6	35.5	54.9	1,060	3,270
May	127	3.3	16.2	25.1	504	1,540
June	43	2.1	10.2	15.8	306	939
The year	294	1.7	18.4	28.5	6,700	20,600

[a] Estimated.

MANUEL LUIS DITCH AT PUOHOKAMOA GULCH, NEAR HUELO, MAUI

LOCATION.—Water-stage recorder in Puohokamoa Gulch at lower portal of tunnel between Haipuaena and Puohokamoa Streams, 3 miles southeast of Kailua.

RECORDS AVAILABLE.—December, 1917, to June, 1931.

EXTREMES.—Maximum discharge during year, 42 million gallons a day or 65 second-feet Nov. 18 (gage height, 2.65 feet); minimum, 0.2 million gallons a day or 0.3 second-foot Feb. 13.

1917–1931: Maximum discharge, 116 million gallons a day or 179 second-feet Jan. 14, 1923 (gage height, 4.93 feet); minimum, 0.05 million gallons a day or 0.08 second-foot Mar. 3, 1920.

REMARKS.—Records good for low stages; fair for medium and high stages. Estimated periods poor. Manuel Luis Ditch is extension of Center Ditch and picks up water at elevation of 500 feet between Kolea and Waikamoi Streams. Regulated by gates.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	23	8.5	0.7	2.7	1.0	0.6		0.2	0.9	[a] 23	0.8	0.7
2	17	2.7	.7	11	1.0	.5		.3	1.2	[a] 17	.8	.6
3	17	3.3	.7	1.9	.9	.5	.8	.3	10.5	[b] 5	.9	.5
4	13	1.6	.6	11	1.1	.4		.2	1.6	3.1	8.9	.5
5	7.9	15.5	.7	10	1.0	.4		.2	10	[a] 19.5	.8	.5
6	9.3	12	9.3	21	12.5	.4		.2	4.4	[b] 8	1.4	.4
7	3.4	1.8	3.2	11	8.3	.4	1.4	1.0	1.2	3.8	1.9	.4
8	1.4	1.5	.7	13.5	9.2	.4		.4	1.0	1.2	.8	.4
9	1.2	6.6	.5	2.4	1.6	.4	.8	.6	1.3	1.0	.8	.4
10	1.1	29	1.7	1.3	1.2	.4		.9	[a] 10.5	.8	3.0	.4
11	1.0	29	1.4	1.1	.8	.3		.3	[a] 9.9	.7	4.2	.4
12	4.6	26	4.2	2.0	.7	.3	1.2	.2	1.7	.7	6.0	.4
13	27	16.5	26	1.0	7.5	.3		.2	1.3	.6	3.7	.4
14	18.5	20	22	.8	17.5	.7		.5	1.0	.6	15	.4
15	2.1	26	22	.8	20	.5	.5	.8	.9	3.3		.3
16	1.0	28	11.5	.8	27	1.5		1.1	.9	7.7	1.9	.3
17	1.0	27	4.0	.7	27	[a] 16		.5	.8	.9	1.0	9.4
18	1.2	23	4.8	.7	27	[a] 14.5		.4	.8	.6	.8	.7
19	17	13.5	1.3	.6	21	1.0	6.5	.4	.7	.5	.8	3.1
20	11.5	4.2	9.5	.5	6.9	.7		.5	.7	8.3	.7	8.9
21	7.8	10.5	1.4	.5	2.2	[b] 15	.5	.6	.6		.7	
22	1.6	2.6	4.4	.7	1.5		.4	.8	.6	22	3.7	9.5
23	1.6	1.7	18	7.8	16.5		.4	.8	.6		2.2	.9
24	2.1	1.6	29	.8	17	.8	.4	3.2	.5	11.5	.8	.5
25	1.3	6.8	27	.6	2.9		.4	17.5	.5	9.3	.7	[a] 11
26	6.9	1.5	10	.5	1.7	[b] 10	.4	14	.4	1.9	.7	7.6
27	6.0	2.2	1.6	.5	1.2	.8	.4	10.5	.4	1.5	.6	.8
28	27	1.0	1.9	3.9	1.0		.3	1.2	.3	1.3	.5	.5
29	27	.9	3.4	28	.8	[b] 15	.3	-------	.3	1.1	[a] 15.5	.4
30	24	.9	4.1	3.8	.7	2.0	.3	-------	.3	1.0	3.0	.4
31	16	.8	-------	1.0	-------		.3	-------	3.1	-------	.8	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	27	1.0	9.69	15.0	300	922
August	29	.8	10.5	16.2	326	999
September	29	.5	7.54	11.7	226	694
October	28	.5	4.61	7.13	143	439
November	27	.7	7.96	12.3	239	733
December	----------	.3	2.87	4.44	89.0	273
January	----------	.3	1.02	1.58	31.7	97
February	17.5	.2	2.06	3.19	57.8	177
March	----------	.3	2.22	3.43	68.9	211
April	----------	.5	6.66	10.3	200	613
May	----------	.5	3.17	4.90	98.4	302
June	----------	.3	2.34	3.62	70.2	215
The year	29	.2	5.07	7.84	1,850	5,680

[a] Partly estimated. [b] Estimated.

MANUEL LUIS DITCH, WEST OF PUOHOKAMOA STREAM, NEAR HUELO, MAUI

LOCATION.—Water-stage recorder 500 feet below intake in Puohokamoa Stream at lower portal of intake tunnel and 3 miles southeast of Kailua.

RECORDS AVAILABLE.—February, 1930, to June, 1931.

EXTREMES.—Maximum discharge during year, 82 million gallons a day or 127 second-feet Nov. 18 (gage height, 5.80 feet); minimum, 0.1 million gallons a day or 0.2 second-foot Feb. 13.

1930–31: Maximum discharge, that of Nov. 18, 1930; minimum, that of Feb. 13, 1931.

REMARKS.—Records fair except those for high and low stages and estimated periods, which are poor. Manuel Luis Ditch is extension of Center Ditch and picks up water at elevation of 500 feet between Kolea and Waikamoi Streams. Regulated by gates.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	23	15	1.0	16.5	1.0	21	1.2	0.5	1.0	27	1.0	
2	19	6.6	.9	18	1.2	21	1.2	.4	7.0	24	.8	
3	19.5	5.9	.8	5.2	1.0	21	1.1	.3	19	24	1.2	
4	14	2.9	.8	18.5	1.4	20	1.1	.3	1.9	4.0	10.5	0.8
5	10.5	17	1.4	11	1.2	20	1.2	.2	15.5	23	.9	
6	13	14	12	20	13	20	2.1	.9	4.3	23	1.4	
7	4.1	3.1	11	13	7.8	20	1.7	11.5	1.7	4.9	2.4	.7
8	1.8	2.4	2.1	15	10.5	20	1.4	.3	1.8	1.4	.9	.7
9	1.5	8.0	.7	3.4	1.9	19.5	1.2	6.0	2.9	1.2	.8	.7
10	1.4	27	3.4	1.6	1.4	20	1.0	.9	16.5	1.0	5.2	.7
11	1.2	26	2.9	1.4	.9	19.5	1.5	.2	14.5	.8	6.2	.8
12	7.5	24	9.2	3.0	.8	7.5	1.8	.1	2.7	.7	8.4	.7
13	24	19.5	18	1.2	8.0	.5	1.0	.1	1.9	.5	5.4	.7
14	19	21	22	1.1	19	.8	.8	.4	1.6	.5	26	.6
15	2.6	24	22	1.0	18.5	.6	.7	1.0	1.4	4.0	17	.6
16	1.3	25	13.5	1.0	26	1.8	.6	3.3	1.4	9.3	2.4	.6
17	1.2	24	5.4	.9	30	20	.7	.3	1.2	.8	1.2	13
18	1.6	13.5	6.0	.8	37	16.5	15.5	.3	1.2	.5	1.2	1.4
19	19	9.1	4.8	.8	40	1.4	5.3	.3	1.1	.4	1.0	6.8
20	12.5	7.6	16	.7	32	.8	.9	.3	1.0	14	1.0	12.5
21	7.7	15.5	6.2	.7	26	16.5	.8	.5	.9	29	1.2	13.5
22	2.1	3.9	4.2	1.2	24	1.0	.8	.7	.9	31	6.0	[a] 10
23	2.1	2.4	16	9.7	39	1.0	.8	.6	.8	26	[b] 6.1	.8
24	3.1	2.0	27	1.0	35	1.2	.5	15.5	.7	15		
25	1.6	8.4	24	.7	27	1.0	.5	23	.6	12.5		12
26	8.4	1.9	16	.6	24	14	.4	16.5	.6	3.7	.9	
27	7.0	2.8	4.6	.6	24	.9	.4	12.5	.6	2.3		
28	27	1.3	2.3	4.6	23	.6	.4	1.3	.6	1.8		
29	29	1.2	5.2	24	22	21	.4	-------	.6	1.4		.8
30	27	3.1	8.8	4.4	21	5.8	.4	-------	.6	1.2	2.7	
31	21	1.2	-------	1.2	-------	1.3	.4	-------	12	-------		

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	29	1.2	10.8	16.7	334	1,030
August	27	1.2	10.9	16.9	339	1,040
September	27	.7	8.94	13.8	268	823
October	24	.6	5.90	9.13	183	561
November	40	.8	17.3	26.8	518	1,590
December	21	.5	10.8	16.7	336	1,030
January	15.5	.4	1.54	2.38	47.8	147
February	23	.1	3.51	5.43	98.2	302
March	19	.6	3.82	5.91	118	363
April	31	.4	9.63	14.9	289	887
May	26	----------	3.90	6.03	121	371
June	----------	----------	3.25	5.03	97.6	299
The year	40	.1	7.53	11.7	2,750	8,440

[a] Estimated. [b] Partly estimated.

SPRECKELS DITCH AT WAHINEPEE, NEAR HUELO, MAUI

LOCATION.—Water-stage recorder between Puohokamoa and Alo Streams, 1,000 feet below intake at Puohokamoa Gulch and 7 miles southeast of Kailua.

RECORDS AVAILABLE.—August, 1928, to June, 1931.

EXTREMES.—Maximum discharge during period, 53 million gallons a day or 82 second-feet Nov. 18 (gage height, 4.00 feet); no flow Feb. 13.

1928–1931: Maximum discharge, 69 million gallons a day or 107 second-feet Dec. 7, 1929 (gage height, 5.05 feet); no flow occasionally when water is shut out of ditch.

REMARKS.—Records good. Intake is on Puohokamoa Stream just below intake of Koolau Ditch and for normal flows takes all water that passes Koolau Ditch intake.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	June
1	19.5	4.7	15.5	25	0.1	0.1	0.1	0.1	0.1	-------
2	12	3.0	15.5	28	.5	.1	.1	.1	5.1	-------
3	7.2	3.0	14	28	.2	.1	.1	.1	18	-------
4	4.3	2.3	15.5	26	.1	.1	.1	.1	.3	-------
5	2.9	19	18	16	.1	.1	.1	.1	12	-------
6	16	9.0	24	22	9.1	.1	.2	.7	.8	-------
7	8.8	9.3	25	12.5	2.4	.1	.1	10	13	-------
8	11	12	21	16	4.2	.1	.1	.1	16	0.1
9	.5	21	17	7.5	1.8	.1	.1	3.8	24	5.9
10	.1	24	26	5.5	1.0	.1	.1	.7	--------	10
11	.1	24	28	3.9	.3	.1	.1	.1	--------	6.3
12	2.0	12	31	5.0	.2	.1	.1	.1	--------	.1
13	17.5	6.2	34	4.2	3.3	.1	.1	.1	--------	4.1
14	2.6	12.5	32	2.4	9.9	.1	.1	.1	--------	.1
15	.4	22	31	2.0	8.7	.1	3.6	.4	--------	.1
16	3.1	28	23	14	17	.3	7.5	1.0	--------	.1
17	.6	19	25	7.3	19.5	.7	7.2	3.9	--------	4.0
18	1.2	13.5	25	.1	17.5	.4	30	5.0	--------	.1
19	11.5	6.5	25	.1	38	.1	21	3.3	--------	2.5
20	3.7	3.6	26	.1	37	.1	9.5	3.9	--------	2.3
21	1.8	4.8	24	.1	35	.3	8.1	4.6	--------	8.8
22	1.5	3.4	21	.6	12	.2	7.2	.2	--------	6.1
23	11	2.4	16.5	5.8	2.5	.2	6.8	3.6	--------	.1
24	20	1.9	26	.8	3.7	.2	3.6	17.5	--------	.1
25	6.9	3.5	24	.1	.4	.1	1.6	23	--------	4.0
26	11	2.7	24	.1	.2	3.0	4.2	3.0	--------	.6
27	12.5	2.9	24	.1	.1	.1	5.7	3.5	--------	.1
28	28	1.9	8.1	2.6	.1	.1	2.8	.2	--------	.1
29	29	11	22	14.5	.1	6.0	.1	--------	--------	.1
30	19.5	19.5	31	1.5	.1	.3	.1	--------	--------	9.0
31	8.5	17.5	--------	.2	--------	.1	.1	--------	--------	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	29	0.1	8.86	13.7	275	843
August	28	1.9	10.5	16.2	326	999
September	34	8.1	23.1	35.7	692	2,130
October	28	.1	8.13	12.6	252	773
November	38	.1	7.50	11.6	225	690
December	6.0	.1	.44	.68	13.7	42
January	30	.1	3.89	6.02	121	370
February	23	.1	3.19	4.94	89.3	274

NOTE.—Data Mar. 10 to June 7 insufficient to determine discharge.

ALO STREAM NEAR HUELO, MAUI

LOCATION.—Water-stage recorder just above Spreckels Ditch inflow and tram crossing and 2½ miles southeast of Kailua.

DRAINAGE AREA.—0.2 square mile.

RECORDS AVAILABLE.—December, 1910, to June, 1931.

EXTREMES.—Maximum discharge during year, 1,600 million gallons a day or 2,480 second-feet Nov. 18 (gage height, 6.90 feet); minimum, 0.3 million gallons a day or 0.5 second-foot June 15, 16.

1910–1931: Maximum discharge, that of Nov. 18, 1930; minimum, 0.3 million gallons a day or 0.5 second-foot Nov. 10, 13, 15–17, 1930, June 15, 16, 1931.

REMARKS.—Records good for ordinary stages; poor for high stages. No diversions.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	7.2	3.9	1.3	7.8	1.3	1.5	1.3	0.8	1.7	14	1.1	1.1
2	3.7	2.7	1.2	2.8	1.7	1.4	1.2	.6	4.2	5.6	1.1	.9
3	3.4	2.8	1.1	2.0	1.2	1.8	1.1	.4	6.8	4.2	1.8	.8
4	2.2	2.0	1.1	3.5	1.1	1.3	1.1	.4	2.3	2.3	4.7	.7
5	2.1	16.5	1.6	11.5	1.0	1.1	1.4	.4	5.1	9.7	1.3	.7
6	6.3	3.6	3.8	9.9	11.5	1.0	2.7	.9	2.2	15.5	2.6	.7
7	2.0	2.0	1.7	3.2	3.6	1.0	1.7	4.2	1.6	2.8	3.0	.6
8	1.7	1.7	1.2	3.4	4.7	1.3	1.4	.7	1.3	1.7	1.8	.6
9	1.5	18	1.1	2.0	4.4	1.0	1.1	2.2	1.4	1.4	1.8	.6
10	1.4	32	3.0	1.7	1.8	1.9	1.0	2.6	7.9	1.2	3.6	.6
11	1.3	37	2.5	1.5	1.3	1.0	1.3	.8	3.3	1.1	2.9	.5
12	2.2	7.2	3.2	1.3	1.2	.9	2.1	.6	1.6	.9	4.4	.4
13	20	3.4	6.0	1.3	3.9	.9	1.0	.6	1.3	.9	4.4	.5
14	3.7	4.5	5.7	1.2	3.1	1.4	.9	1.3	1.2	1.0	11.5	.4
15	1.7	4.0	7.5	1.2	4.9	1.0	.8	4.7	1.0	2.6	5.8	.4
16	1.4	15.5	4.0	1.1	21	3.2	.8	4.5	.9	3.6	2.4	.4
17	1.3	15	2.6	1.1	44	13.5	.8	1.9	.9	1.2	1.7	3.9
18	1.6	9.2	1.9	1.0	128	12.5	7.9	1.6	.8	1.0	1.4	1.1
19	12.5	3.3	1.7	.9	36	2.1	1.3	1.4	.7	.8	1.3	1.4
20	4.6	2.4	3.0	.9	8.0	1.6	1.0	1.3	.7	19.5	1.2	2.9
21	2.9	3.7	1.5	.9	4.5	2.6	.9	1.5	.6	19	1.1	7.1
22	1.9	2.4	3.7	1.0	3.4	1.5	.7	2.1	.6	33	4.2	5.3
23	1.9	2.0	2.9	2.1	63	1.4	.6	1.6	.6	16.5	2.7	2.1
24	2.1	1.9	19	1.3	37	2.1	.6	7.3	.6	4.6	1.2	1.4
25	1.6	3.3	11	1.1	7.9	1.7	.6	5.9	.6	4.2	1.0	4.9
26	5.4	2.1	2.4	.9	4.8	7.9	.6	4.5	.5	2.3	.9	4.2
27	5.7	2.0	2.4	.8	2.9	1.5	.5	6.5	.5	1.8	.9	2.2
28	19.5	1.6	2.0	9.7	2.2	1.3	.5	2.4	.5	1.5	.8	1.4
29	25	1.5	4.4	11.5	1.8	28	.5	-------	.6	1.3	6.9	1.3
30	37	2.2	4.6	2.0	1.6	2.2	.4	-------	.5	1.2	1.7	1.2
31	9.4	1.5	-------	1.3	-------	1.6	.4	-------	8.1	-------	1.1	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	37	1.3	6.26	9.69	194	596
August	37	1.5	6.80	10.5	211	647
September	19	1.1	3.64	5.63	109	335
October	11.5	.8	2.96	4.58	91.9	282
November	128	1.0	13.8	21.4	413	1,270
December	28	.9	3.33	5.15	103	317
January	7.9	.4	1.23	1.90	38.2	117
February	7.3	.4	2.28	3.53	63.7	196
March	8.1	.5	1.95	3.02	60.6	186
April	33	.8	5.88	9.10	176	541
May	11.5	.8	2.65	4.10	82.3	252
June	7.1	.4	1.68	2.60	50.3	155
The year	128	.4	4.37	6.76	1,590	4,890

WAIKAMOI STREAM ABOVE WAILOA DITCH, NEAR HUELO, MAUI

LOCATION.—Water-stage recorder 500 feet above intake of Wailoa Ditch, a quarter of a mile above Spreckels Ditch trail, and 2½ miles southeast of Kailua.

DRAINAGE AREA.—4.4 square miles.

RECORDS AVAILABLE.—January, 1922, to June, 1931.

EXTREMES.—Maximum discharge during year, 684 million gallons a day or 1,060 second-feet Nov. 18 (gage height, 6.95 feet); minimum, 1.0 million gallons a day or 1.6 second-feet Feb. 4.

1922–1931: Maximum discharge, 1,360 million gallons a day or 2,100 second-feet Oct. 16, 1924 (gage height, 10.45 feet); minimum, 0.4 million gallons a day or 0.6 second-foot Nov. 16, 1929.

REMARKS.—Records good for ordinary stages, fair for estimated periods, and poor for high stages. Haleakala ranch and Kula pipe lines divert small amounts of water above station.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	29	8.3	2.8	27	3.1	2.9	4.5	1.9	5.2	47	2.9	3.3
2	15	6.4	2.3	17.5	3.6	2.8	3.7	1.5	7.0	52	2.5	2.8
3	10.5	6.2	2.0	11.5	3.4	3.3	3.4	1.2	38	98	3.2	2.4
4	8.2	4.7	2.3	25	2.5	2.8	3.4	1.1	9.0	12	11	2.2
5	6.4	9.1	2.7	23	2.2	2.2	3.8	1.2	30	42	4.3	2.0
6	20	8.4	8.1	25	53	2.0	4.8	1.7	13	39	4.1	2.0
7	11	4.1	14	13	12.5	1.9	3.4	25	5.9	12	7.1	1.9
8	6.2	3.7	7.5	20	9.6	2.4		4.6	4.6	5.9	5.3	1.7
9	4.5	9.6	2.9	10	6.8	2.0		13.5	4.9	4.4	6.9	1.7
10	3.4	95	4.7	6.7	4.6	2.9	2.8	8.2	16	3.5	8.9	2.1
11	3.4	33	6.0	5.4	3.5	2.2		3.6	12.5	3.1	10.5	2.0
12	4.2	18.5	7.7	6.8	3.0	1.6	5	2.3	5.5	2.8	14	1.8
13	27	11.5	28	6.3	11	1.4		1.8	4.2	2.4	13.5	2.5
14	13.5	17	19	3.6	47	1.7		2.5	3.3	3.0	114	2.2
15	8.8	35	14	3.0	25	1.4		4.5	2.9	5.4	46	1.6
16	5.8	39	8.6	2.8	77	4.9	1.7	5.8	2.6	10.5	11.5	1.6
17	4.7	18	6.4	2.5	109	34		3.2	2.4	4.5	6.9	14.5
18	4.7	15.5	11.5	2.5	178	16.5	* 20	3.1	2.2	3.2	5.2	8.4
19	13	12	12	2.2	152	5.3		2.8	2.0	2.5	4.4	15
20	8.6	6.9	28	2.0	22	3.6	2.7	3.0	1.9	63	3.8	18.5
21	6.4	7.2	11	2.0	12	37		3.4	1.7	164	3.4	30
22	4.6	5.4	9.7	3.4	7.2	8.6	2.0	5.6	1.6	132	7.1	30
23	3.7	5.1	32	18.5	52	9.0	1.8	5.9	1.7	56	9.2	8.0
24	4.6	4.7	79	6.6	31	7.6	1.6	42	1.6	17.5	3.8	4.9
25	3.1	5.0	32	3.8	9.9	4.7	1.6	94	1.5	17	3.0	16
26	8.0	3.8	12.5	2.8	7.4	25	1.6	20	1.4	7.4	2.6	13
27	12	3.8	8.4	2.2	5.1	5.0	1.4	15	1.4	5.5	2.4	6.6
28	67	3.1	6.7	5.6	4.5	3.3	1.4	7.1	1.3	4.0	2.2	4.4
29	77	2.8	8.4	26	3.9	73	1.4	-------	1.6	3.4	43	3.5
30	28	5.4	6.9	9.8	3.3	11.5	1.2	-------	1.4	3.0	10	2.6
31	11.5	4.4	-------	3.8	-------	5.9	1.2	-------	13.5	-------	4.2	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	77	3.1	14.0	21.7	434	1,330
August	95	2.8	13.3	20.6	413	1,270
September	79	2.0	13.2	20.4	397	1,220
October	27	2.0	9.69	15.0	300	922
November	178	2.2	28.8	44.6	865	2,650
December	73	1.4	9.30	14.4	288	885
January	-------	1.2	3.17	4.90	98.3	302
February	94	1.1	10.2	15.8	286	876
March	38	1.3	6.51	10.1	202	619
April	164	2.4	27.5	42.5	826	2,530
May	114	2.2	12.2	18.9	377	1,160
June	30	1.6	6.97	10.8	209	642
The year	178	1.1	12.9	20.0	4,700	14,400

* Estimated.

KAAIEA STREAM NEAR HUELO, MAUI

LOCATION.—Water-stage recorder 700 feet above Hamakua Ditch trail crossing and 2 miles southeast of Kailua.

DRAINAGE AREA.—0.5 square mile.

RECORDS AVAILABLE.—December, 1921, to June, 1931.

EXTREMES.—Maximum discharge during year, 2,300 million gallons a day or 3,560 second-feet Nov. 18 (gage height, 7.93 feet); minimum, 0.5 million gallons a day or 0.8 second-foot Mar. 28.

1921–1931: Maximum discharge, that of Nov. 18, 1930; minimum, 0.3 million gallons a day or 0.5 second-foot July 17, 1922, Mar. 22, 1927, Nov. 16, 1929.

REMARKS.—Records good for ordinary stages, fair for estimated periods, and poor for high stages. No diversions.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	8.2	4.2	1.4	6.2	1.0	1.3	1.4	1.1	2.4	17	1.0	1.0
2	4.6	3.0	1.2	3.6	1.4	1.2	1.2	.9	5.8	6.2	.9	.9
3	4.2	3.4	1.0	2.2	1.6	1.5	1.1	.6	8.8	4.4	1.8	.7
4	2.6	2.2	1.0	4.6	1.0	1.3	1.1	.6	2.8	2.9	5.6	.7
5	2.2	9.8	1.7	10	1.0	1.0	1.4	.6	6.7	15.5	1.3	.7
6	4.9	4.3	4.0	8.7	8.9	1.0	2.0	1.0	2.5	17	2.5	.7
7	2.2	2.2	1.9	3.9	2.7	.9	1.9	6.5	1.6	2.8	3.4	.6
8	1.6	1.9	1.4	5.4	3.7	1.4	1.4	1.0	1.4	1.8	1.9	.6
9	1.5	7.5	1.0	2.4	2.3	.9	1.2	3.1	1.6	1.4	2.1	.6
10	1.4	21	3.6	2.1	1.6	1.6	1.0	3.5	9.5	1.2	4.1	.6
11	1.2	21	3.1	1.6	1.1	.9	1.4	1.2	3.5	1.0	3.6	.6
12	1.8	6.6	3.8	1.4	1.0	.8	2.1	.9	1.8	1.0	4.8	.6
13	13	3.7	6.5	1.3	2.8	.7	1.1	.7	1.4	.9	5.5	.7
14	3.5	5.8	6.0	1.1	3.0	1.1	.9	1.8	1.3	1.1	15.5	.6
15	1.9	5.2	7.4	1.0	3.6	.9	.9	6.3	1.1	3.0	7.7	.6
16	1.4	13	4.2	.9	13.5	2.7	.8	6.1	1.0	4.8	2.6	2.3
17	1.3	12	3.0	.9	24	8.3	.8	3.0	1.0	1.4	1.8	
18	1.5	7.9	2.2	.8	120	7.6	6.2	2.6	.9	1.1	1.5	
19	9.3	3.8	1.8	.7	39	2.1	1.4	2.1	.8	.9	1.3	1.9
20	4.2	2.6	4.2	.7	3.7	1.5	1.0	2.1	.7	29	1.1	
21	2.9	4.2	1.8	.6	2.4	2.6	.9	2.4	.7	26	1.1	7
22	2.1	2.6	4.1	.8	1.8	1.5	.8	3.2	.6	44	4.3	
23	1.9	2.1	4.2	2.6	29	1.5	.7	2.6	.7	18.5	3.1	
24	2.2	2.2	15.5	1.4	19	2.2	.7	10.5	.6	4.2	1.2	
25	1.5	3.2	10	1.0	4.8	1.5	.7	8.5	.6	5.1	1.0	3.1
26	5.4	2.4	3.0	.7	3.1	6.1	.6	8.0	.6	2.1	1.0	
27	6.6	2.4	2.8	.6	2.1	1.5	.6	8.0	.6	1.5	.9	
28	18.5	1.8	2.2	4.8	1.8	1.4	.6	3.2	.6	1.5	.8	
29	18	1.5	3.2	9.4	1.5	18	.6	-------	.7	1.3	7.9	1.3
30	22	3.1	4.5	2.0	1.4	2.2	.6	-------	.6	1.2	1.8	
31	6.4	1.8	-------	1.2	-------	1.5	.6	-------	11	-------	1.0	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	22	1.2	5.16	7.98	160	491
August	21	1.5	5.43	8.40	168	517
September	15.5	1.0	3.72	5.76	112	342
October	10	.6	2.73	4.22	84.6	260
November	120	1.0	10.1	15.6	304	930
December	18	.7	2.54	3.93	78.7	242
January	6.2	.6	1.22	1.89	37.7	116
February	10.5	.6	3.22	4.98	90.1	277
March	11	.6	2.38	3.68	73.9	226
April	44	.9	7.33	11.3	220	675
May	15.5	.8	3.04	4.70	94.1	289
June	--------	--------	1.80	2.79	53.9	166
The year	120	--------	4.05	6.27	1,480	4,530

OOPUOLA STREAM NEAR HUELO, MAUI

LOCATION.—Water-stage recorder between Kaaiea and Nailiilihaele Streams, 100 feet above Wailoa Ditch intake, 300 feet above ditch trail, and 4 miles southeast of Huelo.

DRAINAGE AREA.—0.2 square mile.

RECORDS AVAILABLE.—August, 1930, to June, 1931.

EXTREMES.—Maximum discharge during period, 169 million gallons a day or 261 second-feet Nov. 18 (gage height, 4.24 feet); minimum, 0.1 million gallons a day or 0.2 second-foot Mar. 28, 29.

REMARKS.—Records good except those for very high stages, which are poor. No diversions. Station established Aug. 22, 1930.

Daily and monthly discharge, in million gallons, 1930–31

Day	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	-------	0.8	2.5	0.6	0.5	0.4	0.2	0.5	7.7	0.3	0.3
2	-------	.8	1.7	.7	.5	.4	.2	1.8	1.2	.3	.3
3	-------	.7	1.0	.6	.7	.3	.2	3.7	1.4	.7	.3
4	-------	.7	3.2	.4	.5	.3	.2	.7	.6	2.4	.2
5	-------	.9	4.2	.4	.4	.4	.2	2.2	4.4	.4	.2
6	-------	2.2	4.6	1.6	.4	1.0	.3	.6	7.3	.8	.2
7	-------	1.1	1.8	.8	.4	.8	1.2	.4	.9	1.1	.2
8	-------	.8	2.1	1.1	.5	.5	.2	.3	.5	.7	.2
9	-------	.7	1.0	1.3	.4	.4	.6	.3	.3	.7	.2
10	-------	2.4	.8	.8	.6	.3	.8	3.8	.2	1.0	.2
11	-------	1.8	.7	.4	.4	.7	.2	1.3	.2	.8	.2
12	-------	1.9	.7	.4	.3	1.1	.2	.4	.2	1.4	.2
13	-------	3.0	.6	1.3	.3	.5	.1	.3	.2	1.9	.2
14	-------	3.1	.5	.7	.6	.3	.4	.3	.2	6.0	.2
15	-------	4.4	.4	1.5	.3	.3	1.3	.2	1.0	3.1	.2
16	-------	2.6	.4	5.0	1.5	.2	1.7	.2	1.0	[a] 1.2	.2
17	-------	1.8	.3	10.5	3.5	.2	.5	.2	.3	[b] .9	[a] 1.8
18	-------	1.3	.3	26	3.3	2.4	.5	.2	.2	[b] .6	[a] .4
19	-------	1.1	.3	9.4	.8	.4	.4	.2	.2	[b] .4	.3
20	-------	3.2	.2	1.9	.6	.3	.3	.2	12	[b] .4	.8
21	-------	[a] 1.0	.2	1.2	.7	.2	.5	.2	10.5	[a] .4	3.0
22	[a] 1.4	[b] 1.1	.3	.9	.5	.2	.9	.2	21	1.8	2.2
23	1.2	[a] 1.6	1.1	14	.5	.2	.7	.2	[a] 9.9	1.3	.7
24	1.3	3.3	.6	9.1	[a] 1.0	.2	3.6	.2	[b] 1.4	.5	.4
25	2.4	2.8	.3	2.3	[b] .7	.2	2.6	.2	[b] 1.3	.4	1.6
26	1.4	.9	.2	1.5	[a] 2.3	.2	1.9	.1	[b] .7	.3	1.2
27	1.3	1.2	.2	1.0	.5	.2	2.7	.1	[b] .7	.3	.4
28	1.0	.9	2.1	.8	.4	.2	.8	.1	[b] .5	.3	.2
29	.9	2.0	4.8	.6	8.4	.2	-------	.2	[b] .4	2.5	.2
30	1.6	3.0	1.0	.5	1.1	.2	-------	.1	[a] .3	.7	.2
31	1.0	-------	.6	-------	.6	.2	-------	4.7	-------	.3	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
August 22–31	2.4	0.9	1.35	2.09	13.5	41
September	4.4	.7	1.77	2.74	53.1	163
October	4.8	.2	1.25	1.93	38.7	119
November	26	.4	3.24	5.01	97.3	298
December	8.4	.3	1.07	1.66	33.2	102
January	2.4	.2	.43	.66	13.4	41
February	3.6	.1	.84	1.30	23.4	72
March	4.7	.1	.78	1.21	24.1	74
April	21	.2	2.89	4.47	86.7	266
May	6.0	.3	1.09	1.69	33.9	104
June	3.0	.2	.56	.87	16.9	52
The period (313 days)	26	.1	1.39	2.15	434.0	1,330

[a] Partly estimated. [b] Estimated.

NAILIILIHAELE STREAM NEAR HUELO, MAUI

LOCATION.—Water-stage recorder 200 feet above Wailoa Ditch intake, 700 feet above New Hamakua Ditch trail, and 1½ miles south of Kailua.

DRAINAGE AREA.—2.8 square miles.

RECORDS AVAILABLE.—October, 1913, to June, 1918; August, 1919, to June, 1931.

EXTREMES.—Maximum discharge, 1,520 million gallons a day or 2,350 second-feet Nov. 18 (gage height, 10.74 feet); minimum, 4.3 million gallons a day or 6.6 second-feet Feb. 4–6.

1913–1918, 1919–1931: Maximum discharge, 1,800 million gallons a day or 2,790 second-feet May 1, 1916 (gage height, 6. 3 feet); minimum discharge, 0.45 million gallons a day or 0.7 second-foot July 14, 1920.

REMARKS.—Records fair for ordinary stages; poor for estimated periods and high stages. No diversions.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	54	24	9.0	32	6.8	7.3	9.8	6.4	13	84	8.5	7.5
2	32	18.5	8.4	27	8.2	7.3	9.2	5.8	22	45		
3	26	19	7.8	17.5	8.0	8.0	8.8	4.9	46	37		
4	21	15	7.4	31	5.7	7.1	8.8	4.6	16	14	[a] 26	[a] 6.7
5	18	41	9.0	45	5.4	6.7	9.0	4.6	41	73	8.5	
6	27	24	21	45	38	6.4	11.5	6.1	17	93		6.6
7	17.5	14	16	26	16.5	6.4	9.8	30	12.5	17.5	14	6.6
8	14	12	11	33	22	7.3	8.8	7.5	11	11	9	6.4
9	12	33	8.2	19.5	13	6.0	8.2	18.5	11.5	9.2		6.2
10	11	85	18.5	16	9.2	7.4	7.3	15.5	20	8.5		6.2
11	9.9	78	17.5	13.5	7.2	6.4	8.5	7.5	20	8.0	22	6.2
12	12.5	38	20	12.5	6.4	7.1	11.5	6.4	12	7.5	[a] 25	5.8
13	59	24	45	11	15	7.8	7.5	5.8	10	6.9	[b] 30	6.7
14	24	41	34	9.9	25	9.2	6.9	8.0	9.2	7.5	102	6.2
15	13.5	45	42	8.8	24	8.2	6.6	21	9.0	13.5	47	5.6
16	11	68	24	8.2	65	19	6.2	25	8.5	24	14	5.8
17	9.9	52	18.5	7.4	92	51	6.2	11	8.2	8.8	9	34
18	11.5	43	18.5	6.6	215	40	32	11.5	7.8	7.5		14
19	43	25	15	6.3	90	14.5	10.5	8.8	7.5	6.9		24
20	24	19	28	5.9	26	12	7.5	9.5	7.3	103		34
21	18	24	15	5.5	17	23	6.9	10.5	6.9	152		62
22	14	18.5	22	7.2	12	12.5	6.6	14	6.7	192	[a] 18.5	35
23	12.5	15.5	34	19	69	12.5	6.4	12	6.7	84	[a] 15.5	15.5
24	14	14.5	88	10.5	37	15	6.2	51	6.4	30	8.5	10
25	11	18.5	57	7.4	20	12	6.0	56	6.4	30		46
26	26	14.5	24	5.5	14	32	5.6	30	6.2	13.5		30
27	35	15.5	21	5.0	9.8	12.5	5.6	38	6.0	[a] 10		17
28	92	11.5	18	16.5	9.0	10	5.5	17	5.8	9		10.5
29	80	10.5	19	44	8.2	89	5.3	-------	6.4		[a] 56	9.8
30	50	16	24	13	7.5	15	5.2	-------	5.8		12	9.0
31	32	11.5	-------	7.6	-------	11	4.9	-------	47	-------		-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	92	9.9	26.9	41.6	835	2,560
August	85	10.5	28.7	44.4	889	2,730
September	88	7.4	23.4	36.2	701	2,150
October	45	5.0	16.9	26.1	523	1,610
November	215	5.4	30.1	46.6	902	2,770
December	89	6.0	15.8	24.4	490	1,500
January	32	4.9	8.35	12.9	259	794
February	56	4.6	16.0	24.8	447	1,370
March	47	5.8	13.5	20.9	420	1,280
April	192	6.9	37.5	58.0	1,120	3,450
May	-------	-------	17.8	27.5	551	1,690
June	62	5.6	15.2	23.5	456	1,400
The year	215	4.6	20.8	32.2	7,590	23,300

[a] Partly estimated. [b] Estimated.

KAILUA STREAM NEAR HUELO, MAUI

LOCATION.—Water-stage recorder just above Wailoa Ditch intake, 1¼ miles southwest of Kailua and 2½ miles south of Huelo.

DRAINAGE AREA.—3.0 square miles.

RECORDS AVAILABLE.—December, 1910, to June, 1918; July, 1919, to June, 1931.

EXTREMES.—Maximum discharge during year, 3,390 million gallons a day or 5,250 second-feet Nov. 18 (gage height, 8.61 feet); minimum, 1.3 million gallons a day or 2.0 second-feet Feb. 4–6.

1910–1918, 1919–1931: Maximum discharge, that of Nov. 18, 1930; minimum, 0.07 million gallons a day or 0.11 second-foot June 27, 1921.

REMARKS.—Records good for ordinary stages; poor for high stages and estimated periods. No diversions above station.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	40	12	3.6	23	3.2	6.5	5.7	1.8	6.3	71		
2	19.5	8.8	3.2	17.5	3.4	6.1	4.9	1.6	7.5	56		
3	14	8.3	2.9	12.5	3.4	6.3	4.4	1.4	45	100		2.8
4	11	6.9	2.8	27	2.6	5.5	4.2	1.4	10.5	13.5		
5	9.0	15	2.9	28	2.4	4.8	3.8	1.4	37	63		
6	14	12	7.3	33	43	4.2	4.9	1.6	15.5	67		2.3
7	11	6.4	11	16.5	14.5	3.8	4.0	23	7.8	14	5.5	2.2
8	7.9	5.3	6.8	25	14	4.8	3.7	4.4	6.3	8.3		1.9
9	6.8	13.5	3.8	12	7.6	3.8	3.7	13.5	5.9	6.3		1.9
10	6.1	129	5.8	8.5	4.4	4.4	2.9	8.6	16.5	5.1		1.9
11	5.4	57	6.9	6.9	3.4	3.5	3.2	3.5	11.5	4.4		1.8
12	6.0	20	8.0	6.9	2.9	3.2	4.2	2.4	6.1	3.7		1.6
13	29	14	32	5.5	8.5	2.9	3.0	2.0	4.8	3.4		1.9
14	11.5	26	20	4.8	44	3.2	2.4	2.6	4.0	3.5	136	1.7
15	7.4	53	20	4.0	26	2.8	2.2	5.4	3.5	5.2		1.5
16	6.1	63	11	3.6	100	6.4	2.0	8.5	3.2	11	14	1.5
17	5.2	29	7.7	3.4	119	42	1.9	3.8	2.9	5.1		14
18	5.6	24	19	3.0	470	26	14	3.8	2.5	4.0		7.8
19	20	15	11	2.9	290	8.6	7.8	3.1	2.3	3.3		13.5
20	10.5	10	31	2.5	37	5.9	2.8	3.7	2.2	116		24
21	7.9	11	12.5	2.3	18.5	37	2.5	4.4	2.1	228		38
22	6.3	8.5	13.5	2.6	13	11	2.3	6.3	1.9	202		37
23	5.8	7.2	34	12.5	102	9.4	2.1	5.7	1.9	87	4.8	8.8
24	6.3	6.6	126	6.9	64	9.4	1.9	48	1.7			4.9
25	5.1	7.2	49	4.0	20	6.8	1.9	109	1.7			29
26	10.5	6.1	17	2.9	16	28	1.8	24	1.6	11		18
27	25	6.1	11.5	2.4	10	8.6	1.7	20	1.6			8.1
28	102	4.8	9.1	5.2	9.7	6.1	1.6	8.6	1.6			5.1
29	97	4.0	8.3	24	8.3	91	1.6	-------	1.9			4.0
30	24	5.3	8.8	8.8	7.2	14.5	1.6	-------	1.6		18	3.4
31	15.5	4.6	-------	4.0	-------	7.4	1.4	-------	19.5	-------		-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	102	5.1	17.8	27.5	551	1,690
August	129	4.0	19.3	29.9	600	1,840
September	126	2.8	16.9	26.1	506	1,560
October	33	2.3	10.4	16.1	322	989
November	470	2.4	48.9	75.7	1,470	4,500
December	91	2.8	12.4	19.2	384	1,180
January	14	1.4	3.42	5.29	106	325
February	109	1.4	11.6	17.9	324	997
March	45	1.6	7.69	11.9	238	732
April	228	3.3	38.6	59.7	1,160	3,550
May	136	----------	11.5	17.8	356	1,090
June	38	1.5	8.33	12.9	250	767
The year	470	1.4	17.2	26.6	6,270	19,200

HOOLAWALIILI STREAM NEAR HUELO, MAUI

LOCATION.—Water-stage recorder just above New Hamakua Ditch crossing, 2 miles west of Kailua, and 2 miles southwest of Huelo.

DRAINAGE AREA.—Not determined.

RECORDS AVAILABLE.—April, 1911, to June, 1931.

EXTREMES.—Maximum discharge recorded during year, 578 million gallons a day or 894 second-feet Nov. 18 (gage height, 6.74 feet); minimum, 1.4 million gallons a day or 2.2 second-feet June 16.

1911–1931: Maximum discharge, that of Nov. 18, 1930; minimum, 0.2 million gallons a day or 0.3 second-foot June 8, 1926.

REMARKS.—Records good for ordinary stages, fair for estimated periods, and poor for high stages. No diversions.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	12.5	[a] 4.8	2.4	4.2	2.0	2.8	2.4	1.6	1.8	8.3	2.8	2.0
2	9.2	4.2	2.3	3.8	2.0	2.6	2.3	1.4	3.0	3.0	2.6	2.0
3	7.5	3.8	2.1	3.4	1.9	2.6	2.3	1.4	3.7	2.8	2.8	1.8
4	5.8	3.8	2.0	4.9	1.8	2.4	2.3	1.4	2.4	2.3	3.3	1.7
5	4.8	6.7	2.0	7.1	1.8	2.3	2.2	1.2	3.8	5.1	2.4	1.8
6	4.8	5.4	2.3	8.1	2.6	2.3	[a] 1.8	1.4	3.0	10.5	2.6	1.8
7	4.2	3.8	2.1	4.8	2.1	2.3	[b] 1.7	1.7	2.6	3.9	2.6	1.8
8	3.6	3.4	2.0	5.5	2.1	2.3	[a] 1.4	1.4	2.6	3.3	2.4	1.8
9	3.2	5.5	2.0	4.2	2.1	2.3	[b] 2.2	1.7	2.4	2.6	2.3	1.8
10	3.0	15	2.8	3.6	2.0	2.3	[b] 2.2	1.7	4.4	2.4	2.4	1.8
11	2.8	20	2.7	3.2	1.9	2.2	[b] 3.0	1.6	3.3	2.3	2.6	1.8
12	2.8	12	2.5	2.8	1.8	2.2	2.3	1.4	2.4	2.2	3.0	1.7
13	6.4	8.3	4.5	2.7	2.1	2.0	2.0	1.4	2.3	2.0	3.1	1.7
14	3.6	7.2	3.4	2.5	2.0	2.2	1.8	1.6	2.3	2.2	7.8	1.7
15	3.0	6.9	5.0	2.4	2.5	2.2	1.7	2.0	2.3	2.3	5.1	1.7
16	2.8	10.5	3.6	2.3	7.5	2.6	1.4	2.4	2.2	2.3	3.5	1.7
17	2.7	12	3.2	2.1	16.5	3.5	[a] 1.2	1.8	2.0	2.2	3.0	2.3
18	2.8	9.8	3.9	2.0	66	3.7	[a] 2.3	1.8	2.0	2.0	3.0	1.8
19	5.4	7.5	3.0	2.0	16.5	2.6	1.8	1.6	1.8	2.0	3.0	1.8
20	4.8	6.1	3.9	2.0	8.0	2.4	1.7	1.7	1.8	7.3	3.0	2.0
21	4.2	5.8	3.0	1.9	5.8	2.4	1.7		1.8	12	2.8	3.0
22	3.6	5.1	3.2	1.9	4.4	2.3	1.6		1.7	24	[a] 3.0	3.4
23	3.4	4.4	4.0	[a] 2.0	22	2.3	1.6	3.3	1.7	15	[b] 2.6	2.3
24	3.4	4.0	7.5	[a] 2.0	17.5	2.3	1.6	3.6	1.7	7.0	[a] 2.4	2.0
25	3.0	4.2	7.2	1.9	9.0	2.3	1.6	2.4	1.6	5.4	2.4	2.9
26	3.8	3.8	4.4	1.8	6.4	2.8	1.4	3.5	1.6	4.1	2.4	3.0
27	3.8	3.6	4.2	1.8	4.6	2.3	1.4	3.0	1.6	3.9	2.4	2.4
28	9.3	3.2	3.6	2.4	4.1	2.3	1.4	2.3	1.6	3.5	2.3	2.2
29	9.5	2.8	3.6	4.5	3.5	6.7	1.4	-------	1.8	3.3	3.5	2.0
30	7.6	2.7	4.6	2.5	3.0	2.8	1.4	-------	1.6	3.0	2.6	1.8
31	5.6	2.5	-------	2.1	-------	2.4	1.2	-------	4.6	-------	2.2	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	12.5	2.7	4.93	7.63	153	469
August	20	2.5	6.41	9.92	199	610
September	7.5	2.0	3.43	5.31	103	316
October	8.1	1.8	3.17	4.90	98.4	302
November	66	1.8	7.52	11.6	226	692
December	6.7	2.0	2.60	4.02	80.7	247
January	-------	-------	1.82	2.82	56.3	173
February	3.6	1.2	1.92	2.97	53.7	165
March	4.6	1.6	2.37	3.67	73.4	225
April	24	2.0	5.07	7.84	152	467
May	7.8	2.2	2.96	4.58	91.9	282
June	3.4	1.7	2.05	3.17	61.5	189
The year	66	1.2	3.69	5.71	1,350	4,140

[a] Partly estimated. [b] Estimated.

HOOLAWANUI STREAM NEAR HUELO, MAUI

LOCATION.—Water-stage recorder just above intake of Wailoa Ditch, 2 miles southwest of Huelo; elevation 1,240 feet.

DRAINAGE AREA.—Not determined.

RECORDS AVAILABLE.—December, 1910, to June, 1931.

EXTREMES.—Maximum discharge during year, 584 million gallons a day or 904 second-feet Nov. 18 (gage height, 9.37 feet); minimum, 0.6 million gallons a day or 0.9 second-foot Mar. 31.

1910–1931: Maximum discharge, that of Nov. 18, 1930; minimum, 0.15 million gallons a day or 0.23 second-foot Oct. 25, 1917.

REMARKS.—Records good for ordinary stages; fair for high stages and estimated periods. No diversions.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	17	7.0		10.5	2.3	5.6	4.2	1.4	3.0	[a] 14	4.4	2.6
2	11	5.3		9.4	2.6	4.9	4.2	1.2	3.4	4.1	4.2	2.6
3	8.2	4.9		8.2	2.2	5.3	4.0	1.1	7.5	9.1	4.3	2.5
4	6.7	4.5		10	1.9	4.4	3.7	1.1	3.4	3.3	6.2	2.4
5	5.7	6.9	2.8	13	1.8	4.5	3.6	1.1	7.1	11.5	4.0	2.3
6	6.8	7.0		16	5.9	4.1	3.7	1.3	4.0	29	4.2	2.3
7	5.3	4.3		10.5	4.5	4.2	3.4	2.5	3.1	8.3	4.8	2.2
8	4.2	3.8		13.5	4.8	4.2	3.3	1.3	2.8	5.9	4.2	2.1
9	3.6	5.3	2.2	8.5	3.9	3.7	3.0	2.2	2.5	5.2	3.8	2.1
10	3.4	30	3.9	6.6	3.0	3.7	2.8	2.1	4.6	4.4	4.6	2.1
11	3.0	28	3.4	6.1	2.7	3.6	3.0	1.5	3.2	4.0	5.5	2.0
12	2.8	13.5	3.0	5.5	2.5	3.5	3.4	1.3	2.4	3.8	5.8	2.0
13	8.3	9.1	8.4	5.0	3.9	3.4	2.6	1.2	2.2	3.5	5.0	2.0
14	4.3	10	5.8	4.5	6.0	3.7	2.4	1.5	2.2	3.4	23	1.9
15	3.2	15	7.4	4.1	6.3	3.6	2.2	2.1	2.0	3.8	14.5	1.8
16	2.7	22	6.0	3.6	24	5.0	2.0	2.9	[b] 2.0	4.2	7.4	1.8
17	2.4	16.5	4.2	3.4	45	8.9	1.8	1.9	[a] 2.2	3.4	5.5	3.3
18	2.6	14.5	[a] 7	3.1	135	8.8	4.1	1.8	[b] 2.5	2.9	4.7	2.6
19	6.8	9.8	[b] 5.5	2.8	60	5.2	2.2	1.7	2.3	2.6	4.0	2.8
20	6.0	7.4	7.0	2.6	26	4.6	1.7	1.7	2.3	25	3.5	5.4
21	4.9	7.0	5.6	2.2	17	6.0	1.6	1.8	2.1	50	3.4	8.1
22	3.8		5.9	2.6	13	4.7	1.5	2.0	2.1	75	4.4	7.7
23	3.4		10.5	3.5	58	4.5	1.4	2.3	2.0	37	4.0	3.6
24	3.4		40	2.7	43	4.6	1.4	7.1	1.8	15	3.0	2.9
25	3.0		26	2.4	22	4.5	1.4	10.5	1.7	10.5	2.8	8.3
26	4.6	4.9	14	2.0	15.5	6.7	1.3	4.9	1.5	8.0	2.6	6.4
27	6.2		11.5	1.9	12	4.6	1.3	5.7	1.3	6.8	2.6	4.0
28	31		9.4	3.2	10	4.0	1.3	3.4	1.1	5.6	2.4	3.4
29	25		9.4	7.8	8.2	21	1.2	-------	1.2	5.1	8.5	3.0
30	10.5		9.9	3.8	6.7	5.6	1.2	-------	.9	4.7	3.3	2.8
31	7.2		-------	2.6	-------	4.7	1.2	-------	[b] 5.1	-------	2.8	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	31	2.4	7.00	10.8	217	666
August	30	----------	9.06	14.9	281	862
September	40	----------	7.61	11.8	228	701
October	16	1.9	5.86	9.07	182	557
November	135	1.8	18.3	28.3	550	1,680
December	21	3.4	5.35	8.28	166	509
January	4.2	1.2	2.45	3.79	76.1	233
February	10.5	1.1	2.52	3.90	70.6	217
March	7.5	.9	2.76	4.27	85.5	263
April	75	2.6	12.3	19.0	369	1,130
May	23	2.4	5.27	8.15	163	501
June	8.3	1.8	3.30	5.11	99.0	304
The year	135	.9	6.81	10.5	2,490	7,620

[a] Estimated. [b] Partly estimated.

HONOPOU STREAM NEAR HUELO, MAUI

LOCATION.—Water-stage recorder just above Wailoa Ditch crossing, 2½ miles southwest of Kailua, and 2¼ miles southwest of Huelo; elevation about 1,250 feet.

DRAINAGE AREA.—1.0 square mile.

RECORDS AVAILABLE.—December, 1910, to June, 1931.

EXTREMES.—Maximum discharge during year, 1,220 million gallons a day or 1,890 second-feet Nov. 18 (gage height, 7.28 feet); minimum, 0.3 million gallons a day or 0.5 second-foot Feb. 4.

1910–1931: Maximum discharge, that of Nov. 18, 1930; minimum, 0.15 million gallons a day or 0.23 second-foot July 14, 1920.

REMARKS.—Records good for ordinary stages; poor for high stages and estimated periods. No diversions.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	9.3			3.2	1.2	3.1		0.5			2.3	1.0
2	6.6			2.9	1.3	2.7		.4			2.1	.9
3	5.6			2.5	1.2	2.5		.4	1.6		2.2	.8
4	4.6			3.4	1.1	2.2		.4			2.3	.8
5	4.0	3.2	1.5	5.3	1.1	2.0	1.1			3.1	1.6	.8
6	4.2			5.0	1.7	1.9			1.9		1.7	.8
7	3.4			3.5	1.4	1.8			1.6		1.8	.8
8	3.0			4.0	1.4	1.7			1.5		1.5	.8
9	2.7		1.4	3.1	1.4	1.5		.4	1.5		1.3	.8
10	2.5		2.3	2.8	1.3	1.5			2.9		1.5	.8
11	2.3		2.0	2.7	1.2	1.3	1.4		1.8		1.5	.8
12	2.3		2.0	2.5	1.1	1.2			1.4		1.8	.7
13	5.1		3.4	2.3	1.5	1.1			1.3		1.9	.8
14	2.5		2.3	2.2	1.3	1.2			1.2	1.3	5.6	.6
15	2.2	8	3.1	2.0	1.9	1.1	.7		1.1		3.7	.6
16	2.1		2.2	1.8	5.6	1.7	.7		1.1		2.4	.7
17	2.0		2.0	1.7	11	2.4	.7		1.1		2.2	1.4
18	2.2		3.7	1.6	69	2.3	1.8	.6	1.1		2.0	.9
19	4.0		2.2	1.5	15	1.2	.9		1.1		1.8	.8
20	3.1		2.6	1.5	7.7	1.2	.7		1.0	4.2	1.7	1.0
21	2.6		2.2	1.3	6.0	1.3	.7		.9	7.1	1.6	2.2
22	2.2		2.6	1.5	5.0	1.1	.6		.9	18	2.3	2.4
23	2.2		2.9	1.7	18	1.1	.5		.9	11	1.9	1.2
24	2.2		5.4	1.4	15.5	1.1	.5		.8	5.1	1.4	.9
25	2.0		5.9	1.3	8.6		.5	1.5	.8	3.9	1.3	1.8
26	2.6	3.0	4.1	1.2	6.5		.4		.7	3.3	1.2	1.9
27	2.3		3.7	1.2	5.6	1.8	.4		.7	3.2	1.2	1.3
28	6.4		3.2	1.9	5.0		.4		.7	3.2	1.2	1.1
29			3.3	3.2	4.2		.4	-------	.9	2.9	2.1	1.0
30	5.5		3.6	1.6	3.8		.4	-------	1.8	2.5	1.2	.9
31			-------	1.2	-------		.4	-------		-------	1.0	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	9.3	2.0	3.64	5.63	113	346
August	----------	----------	4.83	7.47	150	460
September	5.9	----------	2.60	4.02	78.1	239
October	5.3	1.2	2.35	3.64	73.0	224
November	69	1.1	6.89	10.7	207	634
December	----------	----------	1.70	2.63	52.8	162
January	----------	.4	.90	1.39	27.9	86
February	----------	----------	.73	1.13	20.4	63
March	----------	----------	1.31	2.03	40.5	125
April	18	----------	3.51	5.43	105	323
May	5.6	1.0	1.91	2.96	59.3	182
June	2.4	.6	1.04	1.61	31.3	96
The year	69	----------	2.62	4.05	958	2,940

WAILOA DITCH AT HONOPOU, NEAR HUELO, MAUI

LOCATION.—Water-stage recorder 100 feet below intake at Honopou Stream, half a mile west of Lupi, and 2½ miles west of Kailua.

RECORDS AVAILABLE.—November, 1922, to June, 1931.

EXTREMES.—Maximum discharge during year, 173 million gallons a day or 268 second-feet Nov. 23 (gage height, 5.77 feet); minimum, 28 million gallons a day or 43 second-feet Jan. 28.

1922–1931: Maximum discharge, that of Nov. 23, 1930; minimum, 12.2 million gallons a day or 18.9 second-feet Jan. 13, 1927.

REMARKS.—Records good except those estimated, which are fair. Wailoa Ditch receives the water from Koolau Ditch at Alo and from all streams west of Alo as far as Halehaku at elevation of about 1,200 feet.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	160	162	96	160	81	58	120	58	118	162	88	88
2		158	92		92	54		51	107	158	81	78
3		158	85		81	74	[a]118	42	162	162	92	71
4	150	144	85		71	92	[a]85	40	154	154	158	67
5		158	96	159	71	81	[b]86	42	154	162	111	64
6	120	158	125	162	102	78	112	51	154	166	112	60
7		149	141	160	141	78	92	145	85	158	150	57
8		126	111	162	128	88	99	71	60	134	122	54
9		129	81	158	130	71	85	126	64	111	134	54
10		166	136	150	101	96	74	134	119	96	128	57
11	150	162	137	130	81	74	88	71	101	85	154	54
12		162	143	130	78	67	[b]103	57	67	78	158	51
13		162	158	122	122	64	[b]74	51	54	74	142	57
14		162	158	103	145	74	64	69	48	81	166	54
15		162	158	92	154	60	60	127	45	125	162	48
16	140	162	158	88	158	136	39	130	42	146	158	48
17		162	154	81	158	158	32	81	40	100	146	134
18		162	145	78	154	159	102	81	38	81	126	123
19		162	138	74	154	126	64	71	36	71	111	146
20		158	152	71	158	99	40	74	34	102	103	154
21	130	158	140	67	118	154	36	85	33	166	101	150
22		158	130	77	92	142	33	114	32	166	158	158
23		154	158	150	154	146	34	111	51	162	150	138
24	136	149	162	112	166	146	51	145	51	162	107	103
25	114	158	162	85	150	114	48	162	48	158	88	140
26	147	150	158	71	120	158	48	158	48	154	85	158
27	150	154	158	64	88	126	48	162	45	142	78	142
28	166	130	154	86	81	99	45	146	45	126	71	107
29	162	114	146	158	71	154	40	-------	48	111	128	96
30	162	118	158	132	64	154	40	-------	42	99	143	85
31	162	107	-------	88	-------	122	42	-------	90	-------	99	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	166	-------	143	221	4,430	13,600
August	166	107	151	234	4,670	14,400
September	162	81	136	210	4,080	12,500
October	-------	64	118	183	3,650	11,200
November	166	64	115	178	3,460	10,600
December	159	54	107	166	3,300	10,200
January	-------	32	68.5	106	2,120	6,520
February	162	40	94.8	147	2,660	8,150
March	162	32	71.5	111	2,220	6,800
April	166	71	128	198	3,850	11,800
May	166	71	123	190	3,810	11,700
June	158	48	93.2	144	2,800	8,580
The year	166	32	112	173	41,000	126,000

[a] Estimated. [b] Partly estimated.

NEW HAMAKUA DITCH AT HONOPOU, NEAR HUELO, MAUI

LOCATION.—Water-stage recorder 600 feet below Honopou Stream crossing, 15 feet above tunnel portal, and 2½ miles west of Kailua.

RECORDS AVAILABLE.—January, 1918, to June, 1931.

EXTREMES.—Maximum discharge during year, 126 million gallons a day or 195 second-feet Nov. 17 (gage height, 5.34 feet); no flow when water is shut out of ditch.

1918–1931: Maximum discharge, that of Nov. 17, 1930; no flow when water is shut out of ditch.

REMARKS.—Records good for ordinary stages, fair for high stages, poor for estimated periods. New Hamakua Ditch diverts water from streams between Waikamoi and Halehaku, above Center and Lowrie Ditches. Regulated by gates and spillways.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	77	39	0.1	38	1.3	0	1.4	0.9	1.2	98	4.3	1.8
2	72	16.5	0		1.0	0	1.4	.9		68	3.8	1.5
3	64	13.5	0		1.0	0	1.4	.8	40	78	3.3	1.0
4	45	1.6	0		1.0	0	1.4	.8		22	47	1.0
5	32	42	0		1.1	0	.9	.8	[a] 37	87	2.0	.9
6	40	40	12	50	27	0	1.2	3.2	30	101	4.5	.9
7	34	2.3	7.6		25	0	2.1	33	2.5	29	17	.9
8	7.2	.7	1.4		27	0	1.0	1.1	1.7	3.5	4.0	.8
9	1.5	13.5	0		6.5	0	1.0	24	2.6	3.0	3.0	.7
10	1.2	74	4.9		2.0	0	.9	8.5	28	2.0	14.5	.7
11	1.0	77	7.5		1.0	0	1.2	.8	4.8	.9	38	.8
12	5.4	72	9.6	2.3	.9	0	2.1	.7	2.1	[a] 4.2	45	1.2
13	64	54	62		20	0	1.4	.7	1.7	2.8	17.5	2.8
14	42	58	60		43	0	.9	.9	1.6	1.8	96	2.9
15	12	52	65		54	0	.9	5.1	1.4	8.4	84	2.8
16	3.2	74	48		79	[b] 0	.9	20	1.4	26	38	2.8
17	.8	74	18.5		95	47	.9	1.0	1.3	2.2	5.5	45
18	.8	69	18.5		64	37	13	1.0	1.3	1.8	1.3	5.3
19	53	55	6.0	1.4	0	7.8	6.0	.8	1.2	1.7	1.2	28
20	42	28	35		0	1.0	1.0	.8	1.2	29	1.1	58
21	26	40	12		0	31	1.0	1.0	1.2	104	1.1	39
22	1.4	18	8.5		0	4.0	.9	1.3	1.0	107	29	73
23	.8	3.2	55	[b] 20	0	5.4	.9	14	1.0	104	28	17.5
24	6.5	5.4	85	[b] 6.8	0	6.0	1.7		1.0	85	1.5	2.4
25	.9	21	60	1.1	0	1.1	1.7		1.1	72	1.2	49
26	24	2.2		1.1	0	37	.9	46	1.0	25	1.1	63
27	18	2.0		1.0	0	3.9	.9		1.0	7.0	1.0	15
28	72	.1	24	9.1	0	.9	.9		1.0	5.5	1.0	2.4
29	72	.1		73	0	57	.8	-------	1.1	5.2	50	1.9
30	64	.1		16.5	0	21	.8	-------	1.0	4.6	23	1.7
31	53	.1	-------	1.4	-------	1.7	.7	-------	39	-------	2.0	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	77	0.8	30.2	46.7	937	2,870
August	77	.1	30.6	47.3	948	2,910
September 1, 6–8, 10–30	85	.1	29.3	45.3	733	2,250
October	----------	1.0	18.7	28.9	580	1,780
November 1–18	95	.9	25.0	38.7	450	1,380
December 17–31	57	.9	17.5	27.1	262	806
January	13	.7	1.68	2.60	52.2	160
February	----------	.7	11.4	17.6	320	980
March	----------	----------	8.12	12.6	252	772
April	107	.9	36.3	56.2	1,090	3,340
May	96	1.0	18.4	28.5	570	1,750
June	73	.7	14.2	22.0	425	1,310
The year (332 days)	107	.1	19.9	30.8	6,620	20,300

[a] Partly estimated. [b] Estimated.

LOWRIE DITCH AT HONOPOU GULCH, NEAR HUELO, MAUI

LOCATION.—Water-stage recorder a quarter of a mile below siphon across Honopou Stream and 1½ miles northwest of Kailua.

RECORDS AVAILABLE.—February, 1930, to June, 1931.

EXTREMES.—Maximum discharge during year, 86 million gallons a day or 133 second-feet Nov. 18 (gage height, 5.45 feet); no flow Jan. 23–24.

1930–31: Maximum discharge, that of Nov. 18, 1930; no flow Jan. 23–24, 1931.

REMARKS.—Record good except those estimated, which are poor. Lowrie Ditch diverts water at elevation of 500 feet from all streams between Kailua and Halehaku Streams. Regulated by gates.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	61	42	13	36		1.8	0.6	0.4	0.2	3.5	16.5	10.5
2	59	30	12	44		1.7	.5	.4	.5		24	9.8
3	59	40	11	27	11	1.5	.5	.4	1.9	1.1	18.5	9.2
4	48	25	11	48		.8	.6	.4			42	8.6
5	37	39	12	42		.7	.6	.4	1.6	2.5	17.5	8.0
6	37	44	21	59		.5	.6	.5			12	8.0
7	36	19.5	27	37		.7	.7	.4			18.5	7.8
8	21	16.5	15.5	53	20	.6	.7	.4	.8	.6	13	7.4
9	18	24	9.8	26		[a] .5	.5	.5			11	7.2
10	25	56	17.5	21			.5	.5	2.4		14.5	7.2
11	22	61	17	23	9.8	.6	.5	.4			30	7.2
12	22	59	22	20	9.2		.5	.3		.4	39	6.6
13	48	56	56	13.5	19		.5	.3			14.5	6.7
14	42	56	56	13	35		.5	.4			64	6.2
15	24	59	56	12	48	.8	.5	.4	.7	1.4	61	5.9
16	20	59	45	11	59	1.2	.4	.5			28	5.9
17	12	59	30	10.5	48	1.0	.4	.3		.6	22	34
18	13	59	27	10.5	54	1.0	.7	.2			28	12
19	42	48	24	9.8	3.0	.8	.4	.2		8.6	18.5	14.5
20	40	35	35	9.2	1.4	.8	.3	.1		21	10.5	36
21	40	40	30	9.2	1.1	.8	.2	.2		64	11	27
22	28	30	23	9.2	1.1	.8	.2	.2	.4	67	29	47
23	25	30	40	26	.8	.8	.1	.4		51	33	25
24	24	30	53	13	1.0	.8	.2	.9		18.5	12	16.5
25	15.5	42	56	8.6	.8	.8	.3	.7		14.5	10.5	37
26	33	19.5	40	8.0	.6	1.1	.3	.5		9.2	10.5	45
27	20	20	28	8.0	2.8	.8	.3	2.1		8.0	9.8	18.5
28	59	16.5	31		5.9	.7	.3	.4	.2	7.2	9.2	8.6
29	59	14.5	19.5	28	4.2	1.2	.3	-------		11	36	7.3
30	59	16.5	39		2.9	.7	.3	-------		13.5	40	6.8
31	53	16.5	-------		-------	.6	.3	-------		-------	20	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	61	12	35.5	54.9	1,100	3,380
August	61	14.5	37.5	58.0	1,160	3,570
September	56	9.8	29.2	45.2	877	2,690
October	59	8.0	23.2	35.9	720	2,210
November	59	.6	15.4	23.8	463	1,420
December	1.8	----------	.85	1.32	26.5	81
January	.7	.1	.43	.66	13.3	41
February	2.1	.1	.46	.71	12.8	40
March	----------	----------	.77	1.19	23.8	73
April	67	----------	10.5	16.2	316	967
May	64	9.2	23.4	36.2	724	2,230
June	47	5.9	15.2	23.5	457	1,400
The year	67	.1	16.2	25.1	5,890	18,100

[a] Partly estimated.

HAIKU DITCH AT KAPALALAEA GULCH, NEAR HUELO, MAUI

LOCATION.—Water-stage recorder in open section of ditch just below tunnel between Honopou and Kapalalaea Gulches and 1¾ miles northwest of Kailua.

RECORDS AVAILABLE.—February, 1930, to June, 1931.

EXTREMES.—Maximum discharge during year, 110 million gallons a day or 170 second-feet Nov. 18 (gage height, 5.87 feet); no flow Nov. 26 to Dec. 1.

1930–31: Maximum discharge, that of Nov. 18, 1930; no flow Nov. 26 to Dec. 1, 1930.

REMARKS.—Records good. Haiku Ditch diverts water at elevation of 250 feet from all streams between Kailua Stream and Maliko Gulch. Regulated by gates.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	74	17	1.4	23	0.8	0.0	12	6.6	26	74	4.8	1.3
2	59	2.5	1.3	14	.8	6.1	11	17	23	39	4.1	1.3
3	22	4.2	1.2	5.8	.7	26	10.5	5.4	72	69	4.1	1.2
4	7.6	2.6	1.2	17.5	.7	21	11.5	5.2	28	11.5	17	1.2
5	5.4	24	1.2	28	.7	18	25	5.2	45	48	2.1	1.3
6	[a] 13	22	8.5	64	15	17	26	5.9	32	70	1.8	1.3
7	[a] 7.3	1.7	6.7	4.0	14	17	17	46	31	13	1.6	1.3
8	3.3	1.4	2.8	31	10.5	17	16	14.5	12	5.3	1.4	1.4
9	[a] 8.6	9.6	1.1	5.4	4.0	14.5	10.5	24	11	4.8	1.1	1.5
10	3.9	71	1.4	1.7	.7	16	9.6	12	45	3.7	7.7	1.5
11	3.1	74	1.2	1.7	.6	14	12	6.6	33	2.2	1.8	1.6
12	[a] 3.7	74	1.2	1.6	.5	14	15	5.4	16	2.0	12.5	1.6
13	[b] 22	30	49	1.5	.7	14	10.5	5.0	13	2.0	17	1.6
14	[a] 12	29	42	1.4	21	17	9.2	7.1	12	2.1	74	1.6
15	2.7	62	45	1.3	15.5	15	8.8	7.6	12	2.2	46	1.6
16	[a] 6.6	67	21	1.2	49	32	8.4	25	20	9.1	2.3	1.5
17	2.5	67	2.7	1.1	68	47	8.0	7.5	10.5	2.2	1.6	1.5
18	2.5	51	2.3	1.1	65	64	27	6.6	8.4	2.0	1.3	1.5
19	[a] 22	16.5	3.0	1.0	30	22	19	5.9	8.0	1.8	1.0	1.4
20	[a] 12	2.9	22	1.0	39	23	8.6	6.4	4.8	18.5	.8	1.4
21	[a] 6.3	5.0	6.1	1.0	38	58	7.8	6.7	6.3	76	.9	14
22	2.1	2.5	1.8	.9	22	19	7.5	9.2	2.5	76	16	2.1
23	2.0	2.3	37	47	6.9	30	7.3	9.4	2.3	76	2.3	1.5
24	2.5	2.1	66	1.1	1.3	35	6.9	45	2.2	68	1.0	9.0
25	2.0	6.3	72	.7	.2	20	6.4	74	2.2	59	1.0	18.5
26	11.5	1.9	13.5	.7	0	58	6.6	62	2.8	27	1.0	46
27	4.5	1.7	2.2	.6	0	17	6.0	61	2.1	21	1.0	2.1
28	65	1.7	2.5	1.0	0	11	6.0	29	2.0	17.5	1.0	1.6
29	65	1.6	1.3	58	0	57	5.9	-------	2.3	9.7	40	25
30	60	1.6	10.5	7.9	0	29	5.9	-------	2.0	5.4	5.7	14.5
31	13	1.7	-------	.9	-------	14	5.9	-------	21	-------	1.5	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	74	2.0	17.0	26.3	527	1,620
August	74	1.4	21.2	32.8	658	2,020
September	72	1.1	14.3	22.1	429	1,320
October	64	.6	10.6	16.4	327	1,010
November	68	0	13.5	20.9	406	1,240
December	64	0	24.6	38.1	763	2,340
January	27	5.9	11.2	17.3	348	1,070
February	74	5.0	18.6	28.8	521	1,600
March	72	2.0	16.5	25.5	510	1,570
April	76	1.8	27.3	42.2	818	2,510
May	74	.8	8.88	13.7	275	845
June	46	1.2	5.43	8.40	163	500
The year	76	0	15.7	24.3	5,740	17,600

[a] Partly estimated. [b] Estimated.

ISLAND OF HAWAII

WAILUKU RIVER AT PUKAMAUI, NEAR HILO, HAWAII

LOCATION.—Water-stage recorder at Pukamaui, three-quarters of a mile above Hilo Boarding School Ditch intake and 4 miles west of Hilo.

DRAINAGE AREA.—97.2 square miles.

RECORDS AVAILABLE.—April, 1923, to June, 1928; July, 1929, to June, 1931.

EXTREMES.—Maximum discharge during year unknown, owing to missing gage-height record; no flow occasionally during year.

1923–1928, 1929–1931: Maximum discharge, 2,480 million gallons a day or 3,840 second-feet June 30, 1926 (gage height, 14.50 feet); no flow when stream dries up.

REMARKS.—Records good for ordinary stages; poor for high stages and estimated periods. Hilo Water Works diverts water for domestic use from pool at control. Regulated by gate.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	135	55	35	50	5.4	8.3	4.6	0	22	0	3.4	3.4
2	[a]196	29	68	156	5.4	7.8	3.8	0	13.5	0	2.1	2.1
3	[b]68	23	34	362	5.2	7.8	3.4	0	11.5	.2	1.5	1.4
4	[b]50	17.5	28	618	6.5	7.2	3.4	0	12	.4	1.3	1.3
5	[a]36	412	23	102	6.5	6.5	3.2	0	8.6	.7	1.0	1.0
6	133	491	22	181	4.8	5.8	4.0	0	6.3	4.4	.7	1.0
7	68	90	21	90	3.8	5.4	5.6	0	5.4	3.2	.4	.7
8	40	54	19.5	88	8.9	5.2	4.8	0	5.2	1.9	.3	.2
9	30	249	19	[a]63	11	4.8	5.0	0	5.6	.9	.3	0
0	22	2,340	154	[b]44	5.6	5.0	4.0	0	5.8	.2	.2	0
11	17	}2,000	140	40	5.0	4.6	6.1	0	8.1	0	.2	0
12	15		73	178	36	3.8	4.0	0	6.1	0	1.3	0
13	14	[a]398	73	99	19.5	3.2	3.0	0	5.2	0	.7	0
14	15	362	50	46	19.5	3.4	2.4	0	4.4	0	0	0
15	12.5	294	40	34	16	3.2	2.1	0	4.0	.2	.1	0
16	11	446	284	26	148	7.2	1.5	0	3.6	3.4	.2	4.2
17	10	497	1,090	21	234	14	1.3	0	3.6	5.0	.8	3.8
18	9.8	[a]330	322	17.5	68	12	1.3	0	3.4	11	12	3.6
19	9.0	244	179	15	35	8.8	1.3	0	2.3	5.8	10	2.1
20	85	109	170	12.5	39	6.7	1.0	.5	1.5	3.6	4.6	1.9
21	127	116	187	12	29	10.5	.8	.5	1.3	2.8	2.8	3.0
22	63	116	109	12	30	12.5	.7	2.6	1.1	2.9	1.7	5.0
23	32	73	96	14	24	9.0	.5	3.8	1.0	27	1.1	5.6
24	32	63	600	19.5	40	6.9	.3	3.4	.9	19	.8	4.4
25	20	90	381	16	17.5	6.5	.2	357	.8	7.2	.5	3.6
26	101	73	140	18	14	33	.2	263	.8	5.4	.5	3.4
27	59	63	90	12	12	12.5	.4	189	.8	4.4	1.0	2.6
28	73	50	78	10	10.5	9.0	.1	48	.5	4.0	.4	1.9
29	85	46	68	8.8	9.5	7.2	0	-------	.2	5.0	.9	1.7
30	54	38	54	8.1	9.5	6.7	0	-------	0	4.2	} 5.5	1.1
31	42	35	--------	6.9	-------	5.6	0	-------	0	-------		------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	196	9.0	53.7	83.1	1,660	5,110
August	----------	17.5	361	559	11,200	34,300
September	1,090	19	155	240	4,650	14,300
October	618	6.9	76.8	119	2,380	7,310
November	234	3.8	29.3	45.3	879	2,700
December	33	3.2	8.07	12.5	250	768
January	6.1	0	2.23	3.45	69.0	212
February	357	0	31.0	48.0	868	2,660
March	22	0	4.69	7.25	146	446
April	27	0	4.09	6.33	123	377
May	12	0	1.99	3.08	61.8	189
June	5.6	0	1.97	3.05	59.0	181
The year	----------	0	61.2	94.7	22,300	68,600

[a] Partly estimated. [b] Estimated.

WAILUKU RIVER ABOVE HILO BOARDING SCHOOL DITCH INTAKE, NEAR HILO, HAWAII

LOCATION.—Water-stage recorder 1,000 feet above Hilo Boarding School Ditch intake, three-quarters of a mile west of Reservoir No. 1, and 4½ miles west of Hilo.

DRAINAGE AREA.—124.5 square miles.

RECORDS AVAILABLE.—July, 1928, to June, 1931.

EXTREMES.—Maximum discharge during year unknown, owing to missing gage-height record; minimum, 1.6 million gallons a day or 2.5 second-feet Feb. 17.

1928–1931: Maximum discharge, 13,500 million gallons a day or 20,900 second-feet Feb. 15, 1929 (gage height, 17.50 feet); minimum, that of Feb. 17, 1931.

REMARKS.—Records good for ordinary stages; poor for high stages and estimated periods. Hilo Water Works diverts about 1 million gallons a day from pool at Pukamaui, three-quarters of a mile upstream.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	678	195	118	152	18.5	28	16.0	4.2	98	4.8	15.4	
2	855	101	228	532	18.5	26	15.2	4.0	60	5.0	12.7	
3	265	80	114	1,230	22	26	14.4	3.9	51	7.2	11.6	
4	183	63	92	1,790	24	23	13.9	3.6	54	7.7	10.8	
5	132	1,750	80	370	20	22	13.0	3.4	36	8.0	9.8	
6	576		76	773	17.0	18.5	14.4	3.4	26	27	9.2	
7	239	950	70	317	17.0	17.0	22	4.0	23	15.7	9.2	
8	152		66	466	51	16.5	18.5	3.3	22	12.5	8.8	7.5
9	114		63	220	42	15.2	23	3.1	24	8.8	9.2	
10	88	6,650	763	152	22	14.4	18.5	3.2	24	7.0	8.6	
11	66		518	129	20	13.7	26	2.8	32	6.6	8.8	
12	54		250	599	131	12.5	17.0	2.6	22	6.2	11.8	
13	51	1,900	250	255	63	11.6	13.9	2.4	18.5	5.8	9.4	
14	51		172	132	66	11.6	12.2	2.1	15.4	6.8	7.7	
15	43		142	105	54	11.4	11.2	1.9	13.9	7.2	7.7	
16	36	1,300	1,240	84	684	35	10.2	1.9	12.5	23	7.8	
17	30		4,810	70	1,150	60	9.6	1.7	13.0	21	9.2	
18	30		1,120	60	264	43	9.6	2.7	12.0	53	60	
19	28		816	51	142	28	10.0	4.0	10.0	24	37	
20	[a] 401	500	746	43	160	22	9.6	5.1	8.6	15.7	18.5	16
21	380		791	40	105	44	8.2	5.2	7.8	13.7	14.2	
22		477	479	40	130	51	7.5	11.6	7.5	13.4	11.0	
23	100	282	442	48	100	30	6.8	15.7	7.3	166	9.4	
24		230	2,650	60	159	23	6.6	18.6	7.2	76	8.6	
25	[a] 70	361	1,600	46	73	20	6.5	1,640	7.0	34	7.8	
26	423	250	572	51	57	114	6.2	1,260	7.5	23	12.7	11.8
27	196	206	332	38	46	40	6.2	657	7.5	20	10.8	8.6
28	311	172	265	30	40	28	5.7	170	7.0	18.5	9.0	6.8
29	419	196	220	24	34	24	5.1	--------	6.0	24	7.3	6.2
30	191	136	162	23	32	28	5.0	--------	5.4	20	65	4.8
31	149	128	--------	20	--------	18.5	4.2	--------	4.8	--------		--------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	855	28	219	339	6,790	20,800
August	--------	63	1,280	1,980	39,800	122,000
September	4,810	63	642	993	19,200	59,100
October	1,790	20	256	396	7,950	24,400
November	1,150	17.0	125	193	3,760	11,500
December	114	11.4	28.3	43.8	876	2,690
January	26	4.2	11.8	18.3	366	1,120
February	1,640	1.7	137	212	3,840	11,800
March	98	4.8	21.0	32.5	651	2,000
April	166	4.8	22.7	35.1	682	2,090
May	--------	7.3	16.3	25.2	504	1,550
June	--------	--------	10.4	16.1	311	957
The year	--------	1.7	232	359	84,700	260,000

[a] Partly estimated.

KAPEHU STREAM AT PIIHONUA, NEAR HILO, HAWAII

LOCATION.—Water-stage recorder at Piihonua, a quarter of a mile above confluence with Wailuku River and 3 miles west of Hilo.

DRAINAGE AREA.—4.9 square miles.

RECORDS AVAILABLE.—November, 1928, to June, 1931.

EXTREMES.—Maximum discharge during year, 3,640 million gallons a day or 5,630 second-feet Aug. 12 (gage height, 10.83 feet); minimum, 1.2 million gallons a day or 1.9 second-feet Feb. 17.

1928–1931: Maximum discharge, that of Aug. 12, 1930; minimum, that of Feb. 17, 1931.

REMARKS.—Records good for low and medium stages; poor for extremely high stages and estimated periods. Small diversion above station for fluming sugarcane.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	181	45	53	48	14.5	23	13	5.2	21	5.0	7.2	4.8
2	115	29	74	70	14	21	12	5.8	17	5.1	6.2	4.2
3	63	27	45	84	17	20	11.5	5.4	17.5	6.2	5.6	4.0
4	48	23	39	232	18	17.5	11	5.0	20	5.8	5.8	4.0
5	36	241	34	75	14	16.5	12	4.9	14	6.7	5.1	4.1
6	89	211	34	167	13.5	15.5	13	4.9	12.5	13	4.9	4.2
7	45	55	32	80	13	15	14.5	5.4	11	7.7	4.5	3.7
8	34	39	29	95	27	14	13	4.9	11.5	5.9	4.6	3.5
9	32	138	27	59	20	13.5	13	4.9	12.5	3.8	4.6	3.4
10	27	443	158	51	15	14	11.5	4.8	12.5	3.4	4.9	3.5
11	25	907	121	42	15.5	13	13	4.3	14.5	3.1	5.0	3.2
12	23	780	71	57	62	12	11	3.5	11	3.0	6.6	3.1
13	23	198	67	45	29	12	9.3	1.7	10	3.0	4.5	3.3
14	20	228	48	34	32	12	8.1	1.8	9.5	3.3	4.1	3.0
15	17	158	45	29	27	11	6.9	1.6	8.8	3.2	4.5	3.6
16	15	281	200	27	160	24	7.0	1.4	8.6	9.0	4.3	
17	14	262	299	25	204	29	7.9	1.4	9.3	6.1	4.6	
18	13	179	155	23	59	20	8.6	1.6	8.4	12.5	29	
19	13	112	123	22	68	15.5	8.4	1.6	7.7	5.9	10	
20	41	75	107	20	55	14	7.9	1.6	7.0	4.6	6.6	9
21	44	106	110	19	39	22	7.2	1.6	6.7	4.9	5.5	
22	47	106	97	20	54	22	6.9	4.4	6.6	5.0	5.0	
23	19	71	89	21	47	16.5	6.7	4.4	6.6	36	4.8	
24	22	63	395	24	77	14	6.4	3.4	6.2	23	4.5	
25	16.5	89	289	21	42	14	6.4	236	6.1	11.5	4.3	
26	83	71	106	20	34	42	6.4	165	6.2	9.0	5.1	
27	37	63	75	18	32	17.5	6.4	108	6.1	7.9	4.6	3.8
28	100	55	67	16.5	27	14.5	6.4	29	5.8	8.6	4.2	
29	80	104	63	16	25	15	6.2	-------	5.5	11.5	4.1	
30	42	55	48	15.5	24	18	5.0	-------	5.1	9.8	7.5	
31	43	45	-------	14.5	-------	14	4.9	-------	5.0	-------	6.4	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	181	13	45.4	70.2	1,410	4,320
August	907	23	170	263	5,260	16,200
September	395	27	103	159	3,100	9,480
October	232	14.5	48.1	74.4	1,490	4,580
November	204	13	42.6	65.9	1,280	3,920
December	42	11	17.5	27.1	542	1,660
January	14.5	4.9	9.08	14.0	282	864
February	236	1.4	22.3	34.5	624	1,920
March	21	5.0	10.0	15.5	310	951
April	36	3.0	8.12	12.6	244	748
May	29	4.1	6.08	9.41	189	578
June	-------	-------	5.31	8.22	159	489
The year	907	1.4	40.8	63.1	14,900	45,700

HONOLII STREAM NEAR HILO, HAWAII

LOCATION.—Water-stage recorder 500 feet above intake of Hilo Sugar Co.'s upper ditch, 2 miles from end of Kaiwiki road, and 10 miles from Hilo.

DRAINAGE AREA.—8.3 square miles.

RECORDS AVAILABLE.—February, 1924, to June, 1931.

EXTREMES.—Maximum discharge during year, 1,860 million gallons a day or 2,880 second-feet Aug. 11 (gage height, 12.50 feet); minimum, 0.6 million gallons a day or 0.9 second-foot Feb. 13, 14.

1924–1931: Maximum discharge, 3,060 million gallons a day or 4,730 second-feet Nov. 21, 1924 (gage height, 16.5 feet; estimated from flood marks); minimum, 0.1 million gallons a day or 0.2 second-foot Feb. 9, Apr. 14, 1926.

REMARKS.—Records good for ordinary stages except those estimated, which are poor. Records poor for high stages. No diversions above station.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	171	25	19.5	20	3.4		4.0	0.9	12	1.1	6.6	9.5
2	141	11	40	70	3.4			2.1	8.2	1.6	4.5	6.1
3	22	8.7	17	143	7.2			1.7	9.4	6.0	3.9	5.2
4	14	7.6	12	395	6.3			1.4	11	6.1	3.5	4.1
5	10.5	254	9.8	49	3.9		3.5	1.3	6.1	9.1	3.0	3.5
6	70	343	9.4	129	3.5		5.8	1.3	4.6	29	2.2	3.5
7	28	30	7.8	42	3.4		7.8	1.7	3.7	11.5	2.2	3.0
8	11	13.5	8.5	117	28		7.8	1.7	3.5	7.8	2.0	2.7
9	8.7	202	9.8	42	16	2.2	10	1.4	4.1	5.1	2.0	2.3
10	7.1	809	147	20	8.5		6.6	1.3	3.5	3.5	2.0	2.3
11	5.8	1,090	135	14	6.8		9.1	1.1	4.4	2.8	2.2	2.2
12	5.0	643	38	60	37		6.1	.8	3.4	2.3	3.0	1.9
13	4.8	94	38	38	24		3.9	.7	2.6	2.1	2.2	1.7
14	6.6	145	28	14	37		3.2	.6	2.1	3.0	1.6	1.7
15	6.3	155	25	10	29		2.6	.7	1.9	2.6	1.6	1.7
16	4.5	320	226	8.2	260		2.3	.8	1.6	17	1.9	12
17	3.5	236	431	6.6			2.1	.8	1.9	9.8	2.3	6.8
18	3.4	161	130	5.6			2.6	2.5	1.6	23	24	7.4
19	3.7	98	68	4.6			3.9	2.8	1.4	9.8	9.4	5.2
20	68	31	62	3.7			3.0	4.6	1.1	6.1	5.8	6.8
21	56	72	84	3.5	22	7	2.5	3.4	1.0	5.6	4.1	8.1
22	47	68	54	5.1			2.1	11	.8	5.1	3.0	9.2
23	11.5	27	67	8.2			1.9	19.5	.8	63	2.3	8.7
24	12.5	22	533	12.5			1.6	63	.9	43	1.9	5.6
25	7.6	54	242	11			1.5	515	.9	12	2.0	5.4
26	122	40	65	13			1.4	311	.9	7.4	6.3	5.2
27	37	31	29	7.5	7		1.3	126	1.1	5.2	4.8	3.5
28	78	22	33	5.3			1.1	24	1.1	8.8	3.7	2.8
29	120	31	30	4.4		14	.9	-------	.9	12	3.2	2.7
30	41	21	20	3.7			.9	-------	1.0	11	31	2.3
31	15	26	-------	3.5	-------		.8	-------	1.3	-------	19.5	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	171	3.4	36.9	57.1	1,140	3,510
August	1,090	7.6	164	254	5,090	15,600
September	533	7.8	87.3	135	2,620	8,040
October	395	3.5	40.9	63.3	1,270	3,890
November	----------	3.4	31.1	48.1	933	2,860
December	----------	----------	5.88	9.10	182	559
January	10	.8	3.62	5.60	112	344
February	515	.6	39.4	61.0	1,100	3,390
March	12	.8	3.19	4.94	98.8	303
April	63	1.1	11.1	17.2	332	1,020
May	31	1.6	5.41	8.37	168	515
June	12	1.7	4.77	7.38	143	439
The year	1,090	.6	36.1	55.9	13,200	40,500

AWINI DITCH AT EAST HONOKANEIKI GULCH, NEAR NIULII, HAWAII

LOCATION.—Water-stage recorder on Awini Ditch at flume across East Honokaneiki Gulch, 4½ miles southeast of Niulii.

RECORDS AVAILABLE.—October, 1927, to June, 1931.

EXTREMES.—Maximum discharge during year, 29 million gallons a day or 45 second-feet Nov. 18 (gage height, 3.60 feet); minimum, 2.3 million gallons a day or 3.6 second-feet Mar. 31.

1927–1931: Maximum discharge, 32 million gallons a day or 50 second-feet Dec. 28, 1927, Sept. 10, 1928 (gage height, 3.51 feet); no flow several days in September, October, November, 1929.

REMARKS.—Records fair. Awini Ditch diverts water at about 2,000 feet elevation from all streams between Waikaloa and Honokane. Regulated by head gates and spillways.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	23	17.5	11	14	3.5		10.5	2.9	7.0	19	9.2	16
2	20	14.5	11	15	3.4		8.6	3.4	8.5	19	8.0	10.5
3	21	15	9.7	19	3.7		6.8	3.2	14.5	19	7.5	7.5
4	19.5	14	9.2	20	4.6	8	6.3	2.9	13.5	17	17.5	6.4
5	17.5	15	9.2	17.5	5.0		6.4	2.8	13	18	18	5.8
6	15	18	11.5	18	5.6		17	3.7	16	20	17	5.0
7	14	13.5	15	17	8.6	6.5	12	9.7	9.7	19.5	16	4.5
8	14	12	11	17	15.5	9.2	8.6	14.5	13	17.5	17.5	4.0
9	13	19	9.2	14.5	17	9.7	7.0	13.5	19.5	14.5	18	3.6
10	12	23	13.5	11.5	13	17	*6.0	11.5	18	10.5	21	3.3
11	*9.7	21	15	9.7	9.7	11	12	9.2	17	9.7	22	3.0
12	*9.2	20	14.5	9.7	7.5	9.7	11	6.3	11.5	10.5	19.5	2.8
13	8.6	20	17	9.2	7.5	7.5	7.5	3.7	8.0	10.5	16	2.6
14	8.0	21	13	8.6	8.0	7.0	5.9	9.3	6.5	11.5	20	3.3
15	8.0	20	10.5	7.5	13	6.5	5.0	15	6.9	16	22	4.4
16	9.2	20	19.5	7.5	20	6.1	4.5	16	6.0	15	17.5	14.5
17	8.0	18	19	7.0	18	8.6	3.9	13	8.0	14.5	15	17
18	13	18	14.5	5.9	15	8.6	10	14	6.0	14	13	18
19	19	19	12	4.9	10.5	9.2	9.7	9.2	5.0	17	10.5	17
20	16	19	11	4.7	13	9.2	6.0	5.0	4.1	23	8.6	17
21	14	20	10.5	4.5	12	15	3.7	4.7	3.3	22	7.5	16
22	14.5	22	18	4.3	12	17	2.9	4.2	3.4	21	7.0	19
23	14	18	19.5	4.5	19.5	16	2.7	3.3	3.4	22	6.5	15
24	13.5	17	22	10.5	17.5	13	4.5	3.5	3.5	21	6.2	11.5
25	12	20	20	13.5	13	9.2	4.5	17.5	3.0	19.5	5.8	15
26	20	19	20	12	12	14	4.1	14	2.8	18	5.5	19
27	19	17.5	17	8.0	9.2	10.5	3.7	13.5	3.0	16	5.0	13
28	23	16	18	6.1	9.2	7.5	3.3	9.2	3.5	13.5	4.5	9.2
29	20	14.5	19.5	5.1	9.5	14.5	3.0	-------	3.1	11	7.4	7.5
30	17.5	13.5	17	4.5		17.5	2.9	-------	2.5	9.7	19	6.3
31	16	12	-------	3.9	-------	13.5	2.8	-------	4.4	-------	18	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	23	8.0	14.9	23.1	461	1,420
August	23	12	17.6	27.2	547	1,670
September	22	9.2	14.6	22.6	438	1,340
October	20	3.9	10.2	15.8	315	970
November	20	3.4	10.8	16.7	326	994
December	17.5	6.1	10.4	16.1	322	989
January	17	2.7	6.54	10.1	203	622
February	17.5	2.8	8.52	13.2	239	732
March	19.5	2.5	7.96	12.3	247	757
April	23	9.7	16.3	25.2	489	1,500
May	22	4.5	13.1	20.3	406	1,250
June	19	2.6	9.92	15.3	298	913
The year	23	2.5	11.8	18.3	4,290	13,200

* Partly estimated.

EAST HONOKANEIKI INTAKE TO AWINI DITCH AT EAST HONOKANEIKI GULCH, NEAR NIULII, HAWAII

LOCATION.—Water-stage recorder on intake tunnel delivering water from East Honokaneiki Gulch to Awini Ditch on west side of gulch, 4½ miles southeast of Niulii.

RECORDS AVAILABLE.—October, 1927, to June, 1931.

EXTREMES.—Maximum discharge during year, 7.7 million gallons a day or 11.9 second-feet July 27, 28 (gage height, 1.34 feet); minimum, 0.4 million gallons a day or 0.6 second-foot June 11–13.

1927–1931: Maximum discharge, 10.8 million gallons a day or 16.7 second-feet Mar. 27, Apr. 2 (gage height, 1.35 feet); no flow several days during September, October, November, 1929.

REMARKS.—Records fair except those estimated, which are poor. Diverts water from East Honokaneiki Gulch to Awini Ditch. All records from October, 1927, to June, 1930, are revised in this paper.

Daily discharge, in million gallons, 1927–1931

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May
1927–28								
1	-------	0.71	0.79	0.83	4.0	0.38	0.44	1.35
2	-------	.14	1.05	.83	4.3	.35	.26	.79
3	-------	.06	.60	.75	5.6	.35	1.8	.35
4	-------	.06	.35	.71	2.9	.35	1.8	.79
5	[a] 0.23	.08	.41	.71	2.3	.32	1.2	4.5
6	.23	.10	.38	.64	2.9	.32	2.5	4.5
7	.20	.10	.60	.60	2.8	.32	4.3	1.2
8	.60	.10	2.0	.97	1.65	.32		.71
9	.68	.12	1.7	1.95	2.4	.32		1.25
10	.32	.12	.97	1.45	1.85	.29	.8	1.5
11	.23	1.0	.68	2.1	1.5	.32		2.6
12	.17		.52	2.6		.44		3.0
13	.14	.87	.48	2.3		.41		
14	.17	.64	.48	2.2		.35	.4	1.75
15	.20	.52	.44		3.1	.29		-------
16	.64	.48	.52	1.85		.26	1.1	-------
17	1.35	1.25	.79	1.9				-------
18	.41	1.4	.52				.71	-------
19	1.75	1.2	.79	4.2	.83			-------
20	1.45	.68	1.55	3.6	.71	.1	.6	-------
21	2.1	.60	2.4	3.7	1.0			-------
22	2.7	1.6	1.5	2.9	.87		.41	-------
23	.97	1.5	1.35	1.55	.56		3.8	-------
24	1.65	.64	.83	1.15	1.5		3.1	-------
25	2.2	1.25	2.6	.87		1.65	1.05	-------
26	1.5	1.0	1.7	.75	1.45	2.6	.64	-------
27	.83	1.2	1.85	4.1	.97	2.6	.52	-------
28	.64	.71	1.65	5.3	.75	2.1	.44	-------
29	.29	.56	1.25	4.7	.44	1.7	.41	-------
30	.10	.48	1.05	5.0	-------	.9	1.25	-------
31	.17	-------	.87	3.9	-------		-------	-------

[a] Partly estimated.

Daily discharge, in million gallons, of East Honokaneiki intake to Awini Ditch at East Honokaneiki Gulch, near Niulii, Hawaii, 1927–1931—Continued

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1928–29												
1	3.2	0.97	1.15	0.32	0.14	0.35	0.83	1.35	0.87	0.38	0.64	0.44
2	4.0	1.55	5.0	.29	1.4	.35	.87	.79	.71	.48	.68	.71
3	4.5	3.0	4.2	.26	2.9	.35	4.0	.68	.60	.92	.64	2.0
4	3.2	3.7	3.3	.26	2.3	.35	2.8	.64	.41	1.2	.60	1.6
5	2.8	2.7	2.1	.23	2.0	1.55	1.85	.60	.41	.97	.60	.71
6	2.7	1.5	2.6	.60	1.0	3.8	4.3	.60	.41	.52	1.8	.41
7	4.0	2.6	4.7	3.2	3.1	2.6	2.0	3.0	.41	.97	2.8	.29
8	2.7	2.4	3.6	.71	3.6	2.6	3.6	4.5	.48	3.5	2.6	.29
9	2.4	1.35	3.6	.35	5.2	4.3	2.7	2.0	.60	2.1	1.3	.23
10	1.15	2.0	4.1	.26	4.3	4.3	1.55	1.5	.20	3.3	.87	.26
11	1.0	2.8	4.6	.23	3.4	4.0	1.15	.92	.52	3.5	2.7	1.9
12	1.15	2.4	3.4	.23	2.9	4.5	1.0	.87	1.8	3.1	2.2	2.9
13	3.0	1.8	2.3	.41	1.85	4.0	1.55	2.2	2.5	2.7	2.7	.83
14	2.8	1.85	2.1	.97	1.75	4.5	4.6	2.5	2.0	2.6	3.3	.48
15	2.4	.68	1.2	.52	1.75	3.8	3.4	3.3	1.75	2.5	2.5	2.2
16	1.15	1.55	.92	.29	1.75	2.8	2.1	3.4	1.35	1.75	2.3	2.2
17	1.0	4.9	.83	.23	1.65	1.75	1.15	4.1	1.35	1.8	1.6	1.2
18	3.0	2.9	1.0	.26	2.6	3.8	1.0	3.5	1.25	3.4	1.1	.92
19	3.3	1.6	4.5	.14	3.3	2.8	4.8	2.0	1.1	2.6	.92	.64
20	1.45	1.1	1.7	.14	2.3	1.8	1.85	4.6	.97	1.65	.87	.56
21	1.9	.83	.92	.14	1.8	2.7	1.3	4.2	.83	1.4	.83	.52
22	3.9	.75	.83	.17	1.05	2.9	4.8	4.4	.79	1.1	.79	.52
23	4.8	1.35	.79	.17	.79	2.2	4.2	2.6	1.05	.92	.79	.48
24	3.3	2.1	.68	.20	.64	2.2	2.4	.26	.83	1.25	.41	.41
25	1.55	2.0	.64	.20	.56	2.2	1.9	.29	.79	1.0	.38	.35
26	4.2	1.95	.60	.20	.56	2.1	1.75	.60	.68	.83	.35	.32
27	2.4	1.95	.48	.17	.44	1.8	1.8	.71	.64	.75	.32	.29
28	1.7	1.75	.44	.17	.41	1.75	1.2	.60	.60	.75	.29	.17
29	1.95	1.45	.41	.17	.35	1.55	2.6	-------	.38	.68	.26	.12
30	1.35	1.35	.38	.14	.32	.97	2.1	-------	.35	.64	.23	.32
31	1.05	1.3	-------	.14	-------	.71	1.45	-------	.35	-------	.20	-------
1929–30												
1	1.55	.10	.23	0	0	5.0	1.2	.79	.97	4.0	2.4	3.2
2	.60	.08	.29	0	0	5.8	1.0	.41	.87	5.7	2.2	2.8
3	.41	.08	.29	0	0	4.4	1.0	.26	1.25	3.7	2.1	2.4
4	.23	.08	.23	0	0	2.9	1.1	.23	1.15	2.3	1.25	6.2
5	.20	.10	.23	0	0	2.1	.79	.20	1.85	2.7	5.1	2.5
6	.14	.08	.20	0	0	1.8	.79	.56	1.65	3.3	4.5	2.4
7	.14	.10	.12	0	0	3.6	.92	3.9	1.75	2.9	3.2	1.0
8	.14	.17	.10	0	0	1.35	1.8	1.7	1.45	3.1	2.3	1.05
9	.12	.20	.08	0	0	.87	.97	1.1	1.35	2.1	1.95	.83
10	.12	3.6	.10	.92	0	.68	1.05	.60	1.35	1.2	1.25	.79
11	.29	2.8	.08	.38	0	.52	3.3	.35	2.0	1.45	1.05	.79
12	.20	.38	.08	.20	0	.44	1.1	.23	1.25	1.7	.92	.83
13	.17	.23	.08	.17	0	.41	2.4	.20	1.05	1.1	2.6	2.3
14	.20	.17	.06	.17	0	.38	1.45	.14	1.0	.87	2.6	2.3
15	.12	.23	.06	.14	0	.9	.79	.14	1.3	.83	1.9	2.8
16	.79	.17	.06	.14	0		.56	.17	1.05	.83	.97	2.0
17	1.15	.17	.06	.14	0		.41	.20	.87	.83	1.25	1.4
18	.35	.17	.12	.17	.04	4.0	.56	.48	1.15	.83	4.5	1.1
19	.20	.14	.12	.02	.02		1.25	.48	1.25	3.4	1.95	.87
20	.17		.03	0	3.8		1.4	.29	1.25	6.0	1.0	.68
21	.23	.1	.04	0	3.6	2.9	.97	.23	1.2	4.2	.71	.44
22	.32		.04	0	1.4	1.75	.68	1.5	.97	4.5	1.05	.35
23	.23		.02	0	3.0	1.35	.48	.52	.87	4.9	.68	2.7
24	.35	.08	0	0	3.7	5.2	.41	.26	.83	4.3	.79	6.4
25	2.1	2.7	0	0	1.45	3.8	1.15	.23	.79	2.8	1.2	4.5
26	.75	1.85	0	0	3.8	3.4	.83	1.8	3.0	2.8	.75	4.5
27	.52	.56	0	0	1.95	4.3	.64	3.4	6.0	2.3	1.5	2.2
28	.44	.38	0	0	3.0	2.1	.48	2.2	2.6	2.3	2.3	2.2
29	.29	.26	0	0	5.1	2.3	.48	-------	1.5	2.3	1.9	7.0
30	.23	.23	0	0	4.8	3.7	.92	-------	1.05	2.5	.97	5.9
31	.17	.23	-------	0	-------	2.1	1.4	-------	.83	-------	.52	-------

Daily discharge, in million gallons, of East Honokaneiki intake to Awini Ditch at East Honokaneiki Gulch, near Niulii, Hawaii, 1927–1931—Continued

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1930–31												
1	4.9	1.9	0.52	0.79	0.10		0.60	0.29	0.35	1.2	0.44	1.4
2	3.4	.97	.44	.79	.10		.41	.12	1.25	2.3	.48	.60
3	3.0	.87	.38	2.5	.10		.29	.10	1.6	2.5	1.7	.41
4	2.5	.75	.38	3.4	.10	1.0	.29	.10	.92	2.6	1.35	.32
5	1.1	2.2	.35	1.7	.12		.29	.12	2.1	6.2	1.55	.23
6	1.25	2.8	.32	1.2	.61		3.5	.08	2.3	2.4	1.45	.14
7	1.35	.87	1.6	1.2	1.35	.17	1.0	.60	.93	1.4	1.15	.10
8	3.1	.64	.60	1.45	.52	.35	.48	.52	1.5	1.25	2.1	.08
9	2.0	2.7	.35	1.1	.44	.92	.32	1.05	1.7	.71	2.3	.06
10	1.7	3.5	.29	.75	.35	2.3	.26	1.95	2.8	.64	4.3	.06
11	.68	1.85	1.8	.46	1.75	.56	.97	.48	2.1	.64	5.1	.04
12	.35	.71	.75	.35	2.2	.29	.56	.06	.97	.79	2.7	.04
13	.35	.83	1.7	.32	1.65	.32	.29	.06	.64	.87	1.15	.08
14	.35	1.25	.87	.29	1.4	.32	.23	.27	.26	1.9	3.2	.23
15	.35	.71	.38	.23	1.35	.29	.20	1.5	.20	.83	2.9	.63
16	.35	1.4	3.0	.23	1.65	.29	.17	2.1	.20	.83	1.5	5.1
17	.35	1.45	5.1	.23	1.25	.29	.10	1.45	.20	.64	.97	3.4
18	.52	.87	1.85	.15	2.6	.29	4.1	.97	.17	.71	.75	3.6
19	3.3	1.2	.64	.06	2.8	.26	2.3	.64	.17	.44	.60	3.6
20	3.1	1.95	.48	.06	2.3	.34	.64	.56	.17	3.6	.56	2.4
21	4.3	2.6	.44	.06	1.7	1.55	.38	.29	.12	4.3	.48	2.0
22	3.1	6.2	2.0	.06	.97	2.9	.29	.17	.10	4.3	.35	3.3
23	1.0	2.8	3.0	.06	.75	1.65	.48	.14	.12	4.2	.29	1.65
24	1.85	2.1	2.7	.23	.79	.64	1.15	.17	.12	4.0	.26	.92
25	.79	2.3	1.45	.70	2.6	.35	1.05	.29	.12	2.9	.26	.92
26	4.2	2.1	1.0	.75	3.2	.79	1.0	.64	.12	.56	.26	3.4
27	3.4	1.9	1.4	.41	4.0	.48	.87	.56	.12	.48	.23	1.0
28	5.4	1.7	2.1	.23	2.3	.32	.75	.56	.10	.38	.14	.83
29	4.3	1.6	1.9	.17	1.2	2.6	.64	-------	.10	.38	.96	.71
30	2.2	.72	1.15	.17		1.85	.52	-------	.08	.41	2.4	.52
31	1.6	.60	-------	.12	-------	1.05	.44	-------	.14	-------	2.1	-------

Monthly discharge, in million gallons, of East Honokaneiki intake to Awini Ditch at East Honokaneiki Gulch, near Niulii, Hawaii, 1927–1931

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
1927–28						
October 5–31	2.7	0.10	0.812	1.26	21.9	67
November	1.6	.06	.672	1.04	20.2	62
December	2.6	.35	1.05	1.62	32.7	100
January	5.3	.60	2.20	3.40	68.2	209
February	5.6	.44	2.22	3.43	64.5	198
March	2.6	----------	.601	.930	18.6	57
April	----------	.26	1.13	1.75	33.8	104
1928–29						
July	4.8	1.0	2.55	3.95	79.0	243
August	4.9	.68	1.94	3.00	60.1	185
September	5.0	.38	2.10	3.25	63.1	193
October	3.2	.14	.380	.588	11.8	36
November	5.2	.32	1.87	2.89	56.1	172
December	4.5	.35	2.43	3.76	75.4	231
January	4.8	.83	2.34	3.62	72.6	223
February	4.6	.26	2.03	3.14	56.7	174
March	2.5	.20	.870	1.35	27.0	83
April	3.5	.38	1.64	2.54	49.3	151
May	3.3	.20	1.21	1.87	37.6	115
June	2.9	.12	.809	1.25	24.3	74
The year	5.2	.12	1.68	2.60	613	1,880
1929–30						
July	2.1	.12	.417	.645	12.9	40
August	3.6	.08	.508	.786	15.7	48
September	.29	0	.091	.141	2.72	8
October	.92	0	.079	.122	2.45	8
November	5.1	0	1.19	1.84	35.7	110
December	5.8	----------	2.61	4.04	81.0	248
January	3.3	.41	1.04	1.61	32.3	99
February	3.9	.14	.806	1.25	22.6	69
March	6.0	.79	1.47	2.27	45.4	140
April	6.0	.83	2.72	4.21	81.7	250
May	5.1	52	1.85	2.86	57.4	176
June	7.0	.35	2.48	3.84	74.4	228
The year	7.0	0	1.27	1.96	464	1,420
1930–31						
July	5.4	.35	2.13	3.30	66.1	203
August	6.2	.60	1.74	2.69	54.0	166
September	5.1	.29	1.30	2.01	38.9	120
October	3.4	.06	6.52	1.01	20.2	62
November	4.0	.10	1.38	2.14	41.4	127
December	2.9	.17	.876	1.36	27.2	83
January	4.1	.10	.793	1.23	24.6	75
February	2.1	.06	.566	.876	15.8	49
March	2.8	.08	.702	1.09	21.8	67
April	6.2	.38	1.81	2.80	54.4	167
May	5.1	.14	1.42	2.20	44.0	135
June	5.1	.04	1.26	1.95	37.8	116
The year	6.2	.04	1.22	1.89	446	1,370

KOHALA DITCH AT POLOLU, NEAR NIULII, HAWAII

LOCATION.—Water-stage recorder on open section of ditch in Pololu Valley just below boundary between Bishop Estate land of Honokane and Territorial land of Pololu, 2¾ miles above mouth of Pololu Stream, and 4 miles south of Niulii.

RECORDS AVAILABLE.—August, 1927, to June, 1931.

EXTREMES.—Maximum discharge during year, 59 million gallons a day or 91 second-feet Apr. 1 (gage height, 3.82 feet); no flow Nov. 13 when water was shut out of ditch.

1927–1931: Maximum discharge, that of Apr. 1, 1931; no flow Nov. 13, 1930.

REMARKS.—Records fair. Regulated by head gates. Kohala Ditch receives flow of Awini Ditch and diverts at elevation of about 1,200 feet from all streams west of Honokane.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	27	31	25	29	15.5	20	24	15	20	45	20	29
2	27	28	27	29	15	21	23	15	23	39	22	24
3	27	29	24	33	15	24	22	14	33	41		21
4	27	29	24	33	15.5	24	21	13	29	36		18.5
5	27	29	24	33	15.5	23	22	13	27	35		18.5
6	27	31	24	31	20	20	35	13	35	31	26	17.5
7	27	29	29	31	37	20	29	19.5	25	29		16.5
8	27	25	25	31	34	23	24	20	25	29		16.5
9	27	30	23	31	29	23	22	31	35	27	[a] 31	15.5
10	27	33	25	27	24	29	21	33	33	24	31	15.5
11	25	31	31	26	20	27	29	22	33	23	33	15.5
12	23	31	29	25	18.5	24	25	17.5	25	24	31	15
13	22	31	31	25	5.2	22	22	15.5	21	27	29	15.5
14	22	31	27	23	14	22	18.5	18	18.5	31	31	15.5
15	22	31	24	23	27	21	17.5	27	17.5	25	33	16.5
16	23	31	33	22	35	20	16.5	39	17.5	25	30	37
17	22	31	35	22	31	23	16.5	29	20	25	27	35
18	25	29	33	21	34	23	33	33	16.5	26	24	41
19	32	29	29	20	29	23	33	24	15.5	22	22	35
20	37	29	29	18.5	27	24	27	18.5	15	26	22	32
21	37	29	25	17.5	25	33	22	17	15	39	21	33
22	35	29	31	18.5	26	35	20	15.5	15	33	21	39
23	29	29	35	18.5	33	31	17.5	15	15	29		33
24	33	29	33	24	31	27	17	15	15	27		25
25	27	29	33	26	29	22	16.5	39	14	27	19	39
26	32	29	33	27	27	29	15.5	33	14	27		39
27	29	29	33	22	25	24	15.5	33	14	29	[a] 17.5	30
28	31	29	33	20	24	21	15	24	14	25	16.5	24
29	31	29	33	18.5	26	31	15	-------	14	23	18.5	22
30	29	27	31	16.5	22	33	15	-------	13	21	29	20
31	29	25	-------	15.5	-------	29	15	-------	19	-------	31	-------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	37	22	27.9	43.2	865	2,650
August	33	25	29.4	45.5	911	2,800
September	35	23	29.0	44.9	871	2,670
October	33	15.5	24.4	37.8	758	2,320
November	37	5.2	24.3	37.6	729	2,240
December	35	20	24.9	38.5	771	2,370
January	35	15	21.5	33.3	665	2,050
February	39	13	22.2	34.3	622	1,910
March	35	13	20.9	32.3	646	1,990
April	45	21	29.0	44.9	870	2,670
May	33	16.5	24.9	38.5	772	2,370
June	41	15	25.2	39.0	754	2,320
The year	45	5.2	25.3	39.1	9,230	28,400

[a] Partly estimated.

KEHENA DITCH NEAR KOHALA, HAWAII

LOCATION.—Water-stage recorder at old Honokane Weir, near head of West Branch of Honokanenui Gulch and 8½ miles southeast of Kohala.

RECORDS AVAILABLE.—December, 1917, to November, 1919; April, 1928, to June, 1931.

EXTREMES.—Maximum discharge during year, 46 million gallons a day or 71 second-feet Apr. 20 (gage height, 1.14 feet); no flow for several days when ditch was dry.

1917–1919, 1928–1931: Maximum discharge, 116 million gallons a day or 179 second-feet Mar. 25–27, 1930 (gage height, 2.04 feet); no flow when ditch was dry.

REMARKS.—Records good. Regulated by several gates above station. Intake on Honokanenui Stream 2 miles above station, at elevation of about 4,200 feet.

Daily and monthly discharge, in million gallons, 1930–31

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	31	9.0	1.6	26	0.2	1.5	2.6	1.6	2.4	37	1.5	4.8
2	15	3.7	1.2	10	.1	1.8	1.7	.9	11	37	1.1	1.1
3	10.5	3.2	.9	18	.1	4.0	1.1	.4	14.5	35	1.3	.3
4	7.6	3.2	.9	24	.1	3.5	.9	.2	12	15.5	16	0
5	4.0	9.5	.9	9.6	0	2.6	1.3	.2	6.9	38	5.5	0
6	2.8	26	1.7	12.5	0	1.7	20	3.4	12	29	6.8	0
7	2.0	6.6	5.8	7.0	8.2	.9	6.9	10.5	4.0	8.4	7.5	0
8	1.6	3.7	2.0	6.7	10.5	.9	2.8	13.5	3.3	3.5	5.0	0
9	1.4	13.5	1.2	3.7	5.8	.9	1.7	34	7.2	2.0	6.9	0
10	1.2	43	1.4	2.2	2.2	5.6	1.4	9.0	8.9	1.5	21	0
11	1.1	30	11	1.4	1.1	2.4	10	3.3	10	2.0	25	0
12	.9	12	7.8	1.2	.6	1.3	6.4	1.8	3.3	3.8	10.5	0
13	.8	17.5	11.5	.9	1.2	.7	2.2	1.1	1.7	5.2	4.0	0
14	.8	32	5.0	.8	15	.5	.9	4.6	1.1	12	16	.1
15	.8	36	2.6	.6	10	.4	.5	20	.8	4.7	26	2.8
16	.8	38	23	.4	35	.4	.3	11	.7	8.6	6.4	21
17	.8	36	32	.3	20	2.0	.2	16	.5	4.7	2.8	21
18	5.5	27	16	.2	14.5	2.6	17	5.2	.5	5.5	1.8	28
19	19	9.0	8.1	.1	14	2.4	10.5	2.6	.5	2.4	1.7	20
20	23	5.0	15.5	.1	3.7	7.7	2.0	2.2	.4	19.5	2.4	11
21	18.5	11.5	9.6	.1	2.6	18.5	.8	2.2	.3	37	1.5	15.5
22	11.5	36	14	.2	2.2	29	.3	2.2	.3	33	.9	24
23	5.0	13.5	23	.6	24	17.5	.2	1.5	.3	30	.8	11.5
24	9.7	6.7	36	4.6	30	5.5	.1	27	.2	27	.7	4.5
25	3.7	26	35	4.2	7.5	3.3	0	[a] 35	.2	15	.4	27
26	16.5	11.5	20	4.8	21	17.5	0	15	.2	5.7	.3	24
27	12.5	7.8	8.1	1.8	14	4.2	0	12	.2	22	.2	5.2
28	28	4.2	11.5	.8	5.3	2.0	0	4.5	.2	6.1	.1	2.6
29	11.5	2.8	8.1	.5	5.8	20	0	-------	.2	2.8	.2	2.0
30	7.6	2.4	5.0	.2	2.8	25	0	-------	.2	1.8	13.5	1.3
31	3.7	1.8	-------	.2	-------	6.0	0	-------	6.8	-------	4.9	------

Month	Million gallons a day			Second-feet (mean)	Total run-off	
	Maximum	Minimum	Mean		Million gallons	Acre-feet
July	31	0.8	8.35	12.9	259	794
August	43	1.8	15.7	24.3	488	1,490
September	36	.9	10.7	16.6	320	985
October	26	.1	4.64	7.18	144	441
November	35	0	8.58	13.3	258	790
December	29	.4	6.20	9.59	192	590
January	20	0	2.96	4.58	91.8	282
February	-------	.2	8.60	13.3	241	739
March	14.5	.2	3.57	5.52	111	340
April	38	1.5	15.2	23.5	456	1,400
May	26	.1	6.22	9.62	193	592
June	28	0	7.59	11.7	228	699
The year	43	0	8.17	12.6	2,980	9,140

[a] Estimated.

MISCELLANEOUS MEASUREMENTS

Measurements of streams and ditches on the island of Hawaii at other than regular gaging stations are listed below:

Miscellaneous discharge measurements on island of Hawaii, 1930–31

Date	Stream	Tributary to—	Locality	Discharge	
				Second-feet	Million gallons a day
Jan. 14	Awini Ditch	Kohala Ditch	Honokane Weir	7.00	4.52
May 27	do	do	do	5.09	3.29
Jan. 19	Pae Stream	Pacific Ocean	Near Niulii	1.27	.821
19	Kalmu Stream	do	do	6.47	4.18
20	Punalulu Stream	do	do	2.99	1.93
20	Paopao Stream	do	do	.427	.276
20	West Branch of Paopao Stream.	Paopao Stream	do	.818	.529
20	Kukui Stream	Pacific Ocean	do	.837	.541
20	Waimaile Stream	do	do	.274	.177

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