OTHER USGS STREAM FLOW DATA FOR WAIHE`E

EXHIBIT 8

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY
GEORGE OTIS SMITH, DIRECTOR

WATER-SUPPLY PAPER 318

WATER RESOURCES OF HAWAII

1909–1911

PREPARED UNDER THE DIRECTION OF M. O. LEIGHTON

BY

W. F. MARTIN AND C. H. PIERCE

WASHINGTON
GOVERNMENT PRINTING OFFICE
1913

000048

cane and taro. The cane belt is on the western and eastern sides of West Maui, the northwestern and southeastern sides of East Maui, and on the isthmus. Taro is grown in some of the valleys, and a small quantity of rice is also grown. Both taro and rice require irrigation.

Good roads exist on central Maui, along the western and southern coasts of West Maui, along the northern coast of East Maui as far as Kailua, and along the southeastern coast. Around the other parts of the island there is only a horse trail.

Wailuku is the principal town, and the county seat of Maui County. Lahaina, Kahului, Puunene, and Paia are important places.

The streams are described in clockwise order around West Maui, beginning with Waihee at the northeast, and in east-to-west order along the ditch systems of East Maui.

WEST MAUI.

WAIHEE STREAM BASIN.

GENERAL FEATURES.

Waihee basin lies on the northeast slope of West Maui south of Kahakuloa and north of Waiehu. It is about 6 miles long and 1 to 2 miles wide and comprises an area of approximately 10 square miles. The basin is deep and narrow, the upper part being closed in by almost vertical walls which separate it from Honokahau on the west and Iao at the south.

The almost incessant rainfall on the northeastern slopes of Eke and Puu Kukui gives a large run-off from a comparatively small drainage area. Numerous tributaries enter the main stream from both sides, and several tunnels have also been driven which develop additional water. The Waihee canal and Spreckels ditch divert water from the south side of the stream for irrigating cane, and several native auwais take water at lower elevations for irrigating taro.

Gaging stations have been established on the main stream at the intake of Waihee canal, and on Waihee canal and Spreckels ditch.

WAIHEE STREAM AT DAM NEAR WAIHEE, MAUI.

A station was established on Waihee stream November 17, 1910. This station is at the dam which forms the intake of Waihee canal.

Records at this point show only the amount of water passing down the main stream after Waihee canal has been supplied.

A staff gage on the left wall is used for obtaining gage heights.

The discharge at this station, added to that of Waihee canal, gives the total flow of the stream, and also includes the water developed by two tunnels which were driven in 1909 jointly by the Wailuku Sugar Co. and the Hawaiian Commercial & Sugar Co.

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Discharge measurements of Waihee Stream at dam near Waihee, Maui, in 1910–11.

Date.	Hydrographer.	Width.	Area of section.	Gage height.	Discharge.
		Feet.	*Sq. ft.*	*Feet.*	*Sec.-ft.*
1910. Dec. 29	Pierce and Schulz			0.35	[a] 29.9
1911. Jan. 27	Martin and Pierce [b]	43.8	28.7	.68	35.1
Mar. 28	C. H. Pierce [c]	36.4	42.6	.53	51.5
Aug. 22	J. B. Stewart			.27	[a] 18.0
Nov. 27	do			.00	[d] .05

[a] Discharge is the difference between the result of the measurement of stream above intake of Waihee Canal and of the canal below intake.
[b] Measurement by wading on crest of dam.
[c] Measurement above intake of Waihee Canal. The intake gates were closed during measurement and no water was being diverted by Waihee Canal.
[d] Discharge estimated.

Daily gage height, in feet, of Waihee Stream at dam near Waihee, Maui, for 1910–11.

[Joaquin Santos, observer.]

Day.	Nov.	Dec.	Day.	Nov.	Dec.	Day.	Nov.	Dec.
1910.			1910.			1910.		
1		1.55	11		0.9	21	0.0	0.45
2		1.9	12		.8	22	.0	.7
3		2.0	13		.8	23	.05	.5
4		2.0	14		.7	24	.3	1.1
5		1.5	15		.45	25	.0	.8
6		1.9	16		.0	26	.0	.8
7		1.45	17	0.3	.0	27	.3	.75
8		1.0	18	.25	.0	28	.6	.4
9		1.0	19	.10	.25	29	1.3	.4
10		1.0	20	.15	.25	30	.95	.75
						31		.8

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1911.												
1	0.8	0.4	0.8	0.4	0.4	0.6	0.4	0.5	0.5	1.6	0.4	0.2
2	.8	.7	.5	.6	1.0	.8	.4	.6	.5	1.1	.4	.2
3	.35	.5	.3	.4	.4	.8	.4	.6	.5	.5	.4	.2
4	.5	1.1	.3	.4	.6	.8	.4	.7	.7	.5	.4	.2
5	.8	.5	.3	.4	.6	.8	.4	.8	.7	.5	.4	.2
6	1.3	1.05	.3	.3	.6	.8	.8	.8	.7	.5	.4	.2
7	1.25	.5	.3	.3	.7	.8	.8	.8	.6	.5	.4	.1
8	1.2	.6	.3	.4	.4	.8	.8	.9	.6	.5	.4	.1
9	1.2	1.25	.3	.3	3.1	1.0	.4	.8	.4	.5	.3	.0
10	1.3	1.55	.4	.3	1.8	1.0	.4	.7	.8	.5	.3	.0
11	1.3	.5	.3	.3	.8	1.0	.6	.8	.9	.4	.1	.0
12	1.3	.5	.3	.3	.8	1.2	.8	.8	.8	.4	.1	.05
13	.6	.5	.3	.3	.8	1.0	.8	.85	.8	.4	.0	.15
14	.6	.5	.3	.3	1.3	.8	1.0	.8	.7	.4	1.05	.10
15	.6	.5	.3	.3	1.0	.8	1.0	.8	.6	.4	.25	1.0
16	.8	.5	.3	.3	1.0	.8	.95	.9	.6	.4	.1	.8
17	1.5	.5	.8	.8	.8	.6	.6	.9	.8	.4	.3	.4
18	1.1	.5	.8	1.6	.8	.6	.5	1.15	.8	.65	.3	.55
19	1.1	.5	.55	1.7	.8	.4	.6	.8	.8	.4	.3	.5
20	1.1	.5	.7	1.9	.8	.8	.55	.8	1.5	.4	.3	.1
21	1.1	.5	.85	1.9	.8	.8	.6	.8	2.2	.4	.55	.0
22	1.1	.5	1.0	1.9	1.0	.8	.6	.6	1.4	.3	.8	.25
23	1.1	.5	.9	1.95	1.0	.6	.6	.4	4.4	.3	.8	.1
24	1.25	.2	.95	1.85	1.0	.8	.5	.4	.95	.3	.8	.1
25	1.2	1.35	.6	1.8	1.0	.8	.5	.4	1.0	.3	.7	.1
26	1.2	.5	.6	1.0	1.0	.4	.5	.4	1.1	.4	.8	.1
27	.7	.5	1.25	.9	1.0	.4	.5	.4	1.0	.4	.8	.1
28	1.3	.9	.3	.5	.9	.8	.5	.4	.8	.35	.85	.3
29	.8		.8	.5	1.2	.8	.5	1.25	1.5	.3	.8	.3
30	.4		.6	.5	1.5	.7	.5	.75	2.0	.4	.8	.6
31	.4		.4		1.3		.5	.5		.4		.9

Daily discharge, in second-feet, of Waihee Stream at dam near Waihee, Maui, for 1910–11.

Day	Nov.	Dec.	Day.	Nov.	Dec.	Day.	Nov.	Dec.
1910			11		130	21	0.0	44
1		275	12		110	22	0.0	90
2		360	13		110	23	2.3	53
3		385	14		90	24	22	173
4		385	15		44	25	0.0	110
5		263	16		0.0	26	0.0	110
6		360	17	22	0.0	27	22	100
7		252	18	17	0.0	28	71	36
8		151	19	4.6	17	29	217	36
9		151	20	8.3	17	30	140	100
10		151				31		110

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct	Nov.	Dec
1911.												
1	110	36	110	36	36	71	36	53	53	287	36	12
2	110	90	53	71	151	110	36	71	53	173	36	12
3	29	53	22	36	36	110	36	71	53	53	36	12
4	53	173	22	36	71	110	36	90	90	53	36	12
5	110	53	22	36	71	110	36	110	90	53	36	12
6	217	162	22	22	71	110	110	110	90	53	36	12
7	200	53	22	22	90	110	110	110	71	53	36	4.6
8	193	71	22	36	36	110	110	130	71	53	36	4.6
9	193	206	22	22	660	151	36	110	36	53	22	0.0
10	217	275	36	22	335	151	36	90	110	53	22	0.0
11	217	53	22	22	110	151	71	110	130	35	4.6	0.0
12	217	53	22	22	110	195	110	110	110	35	4.6	2.3
13	71	53	22	22	110	151	110	120	110	35	90	8.3
14	71	53	22	22	217	110	151	110	90	35	162	4.6
15	71	53	22	22	151	110	151	110	71	35	17	4.6
16	110	53	22	22	151	110	140	130	71	35	4.6	110
17	263	53	110	110	110	71	71	130	110	35	22	36
18	173	53	110	287	110	71	53	184	110	80	22	62
19	173	53	62	311	110	36	71	110	110	35	22	53
20	173	53	90	360	110	110	62	110	263	35	22	4.6
21	173	53	120	360	110	110	71	110	435	35	62	0.0
22	173	53	151	360	151	110	71	71	240	22	110	17
23	173	53	130	372	151	71	71	36	985	22	110	4.6
24	206	12	140	348	151	110	53	36	140	22	110	4.6
25	193	228	71	335	151	110	53	36	151	22	90	4.6
26	193	53	71	151	151	36	53	36	173	36	110	
27	90	53	206	130	151	36	53	36	151	36	110	
28	217	130	22	53	130	110	53	36	110	29	120	22
29	110		110	53	195	110	53	206	263	22	110	22
30	36		71	53	263	90	53	100	385	36	110	71
31	36		36		217		53	53		36		130

NOTE.—Daily discharge computed from a rating curve that is fairly well defined below 100 second-feet.

0000030

Monthly discharge of Waihee Stream at dam near Waihee, Maui, for 1910–11.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
1910.					
November 17-30	217	0.0	37.6	1,040	B.
December	385	0.0	136	8,360	C.
1911.					
January	263	29	148	9,100	C.
February	275	12	83.5	4,640	B.
March	206	22	64	3,940	B.
April	372	22	125	7,440	C.
May	660	36	144	8,850	C.
June	195	36	105	6,250	B.
July	151	36	71.3	4,380	B.
August	206	36	94.4	5,800	B.
September	985	36	164	9,760	C.
October	287	22	51.8	3,190	B.
November	162	4.6	58.2	3,460	B.
December	130	0.0	21.0	1,290	B.
The year	985	0.0	94.6	68,100	

NOTE.—These estimates do not include the water diverted by Waihee Canal.

WAIHEE CANAL NEAR WAIHEE, MAUI.

Waihee canal diverts water from the south side of Waihee Stream at elevation 650 feet.

A station was established on this canal November 17, 1910, at a point about 2½ miles above Waihee and about 1 mile below the intake. It is 20 feet above the chute through which water is at certain times turned from Waihee canal to Spreckels ditch.

Gage heights are obtained from a staff gage, graduated in tenths of feet, which is placed on the *mauka* or right side of the ditch. The ditch at this place has a fairly smooth concrete lining and regular cross section. The discharge at this station added to that of the station on Waihee Stream at the dam gives the total discharge of Waihee Stream.

Discharge measurements of Waihee canal near Waihee, Maui, in 1910–11.

Date.	Hydrographer.	Width.	Area of action.	Gage height.	Discharge.
		Feet.	*Sq. ft.*	*Feet.*	*Sec.-ft.*
1910. Dec. 29	Pierce and Schulz	5.5	10.8	1.95	42.3
1911. Jan. 27	Martin and Pierce	5.5	11.8	2.13	52.1
Aug. 26	J. B. Stewart	5.35	14.4	2.15	56.4
Nov. 27	do	5.6	14.6	2.15	57.7
Dec. 21	do	5.7	14.3	2.10	56.6

NOTE.—An additional measurement made early in 1912 was used in determining the rating. Measurements made at various sections.

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Daily gage height, in feet, of Waihee canal near Waihee, Maui, for 1910–11.

[Joaquin Santos, observer.]

Day.	Nov.	Dec.	Day.	Nov.	Dec.	Day.	Nov.	Dec.
1910.								
1		2.0	11		1.8	21	1.95	2.2
2		2.0	12		1.8	22	1.8	2.55
3		2.0	13		1.8	23	1.9	2.2
4		2.0	14		1.8	24	2.1	2.3
5		2.0	15		1.85	25	1.95	2.1
6		1.8	16		2.2	26	1.8	2.1
7		1.8	17	2.3	2.2	27	2.15	2.1
8		1.8	18	2.15	2.2	28	2.1	2.0
9		.0	19	1.9	2.2	29	2.2	2.0
10		.0	20	1.8	2.2	30	2.2	2.15
						31		2.[illegible]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1911.												
1	2.2	1.6	1.8	1.75	1.9	2.2	2.2	2.2	2.0	2.6	2.6	2.2
2	2.2	1.9	1.8	.9	2.3	2.2	2.2	2.2	2.2	2.6	2.6	2.2
3	2.0	1.9	1.9	.0	2.1	2.2	2.4	2.1	2.2	2.6	2.6	2.2
4	2.2	2.1	1.9	.0	2.1	2.2	2.7	2.35	2.6	2.6	2.6	2.2
5	2.2	2.1	1.9	.0	2.1	2.2	2.6	2.2	2.6	2.6	2.6	2.1
6	2.2	2.1	2.0	1.5	2.1	2.4	2.7	2.2	2.6	2.6	2.6	2.1
7	2.2	2.1	2.0	1.5	2.1	2.4	2.3	2.2	2.6	2.6	2.6	2.15
8	2.2	2.1	2.1	1.5	2.1	2.2	2.6	2.2	2.6	2.6	2.6	2.2
9	2.2	2.1	2.1	1.5	2.3	2.4	2.6	2.55	2.6	2.6	2.4	2.2
10	2.2	1.95	2.1	1.5	2.5	2.3	2.6	2.2	2.6	2.6	2.3	2.2
11	2.2	1.8	2.1	1.5	2.5	2.3	2.8	2.2	2.8	2.6	2.2	2.2
12	2.2	1.8	2.1	1.6	2.5	2.2	2.8	2.2	2.8	2.6	2.2	2.2
13	2.2	2.2	2.1	1.6	2.5	2.2	2.6	2.65	2.6	2.6	2.6	2.2
14	2.2	2.2	2.1	1.6	2.5	2.2	2.8	2.6	2.6	2.6	2.5	2.2
15	2.2	2.2	2.1	1.6	2.5	2.2	2.8	2.6	2.6	2.6	2.2	2.2
16	2.2	2.2	2.1	1.6	2.5	2.2	2.8	2.6	2.4	2.6	2.2	2.2
17	2.0	2.2	2.1	2.55	2.5	2.2	2.5	2.6	2.5	2.6	2.2	2.2
18	2.0	2.2	2.1	3.0	2.5	2.2	2.0	2.7	2.7	2.6	2.2	2.2
19	2.2	2.2	2.15	2.3	2.5	2.4	2.1	2.2	2.6	2.6	2.2	2.2
20	1.6	2.2	2.2	2.2	2.9	2.4	2.1	2.4	2.6	2.6	2.2	2.05
21	1.6	2.2	2.2	2.2	2.8	2.2	2.2	2.2	2.6	2.5	2.3	2.[illegible]
22	1.6	2.2	.0	2.2	2.7	2.5	2.2	2.2	2.6	2.4	2.4	2.2
23	1.6	2.2	1.6	2.2	2.55	2.2	2.2	2.0	2.6	2.6	2.2	2.
24	1.6	2.3	1.6	2.2	2.5	2.4	2.4	2.2	2.6	2.6	2.2	2.
25	1.6	1.95	1.6	2.0	2.7	2.2	2.6	2.6	2.6	2.6	2.4	2.
26	1.6	1.8	1.6	2.2	2.9	2.2	2.4	2.0	2.6	2.6	2.3	2.05
27	1.85	1.8	.8	2.0	2.8	2.3	2.2	2.0	2.6	2.6	2.3	2.
28	2.1	1.8	1.7	2.1	2.8	2.2	2.2	2.2	2.6	2.6	2.2	2.2
29	2.1		1.7	2.1	2.8	2.4	2.2	2.4	2.6	2.6	2.4	2.35
30	1.6		1.7	2.1	2.9	2.2	2.2	2.1	2.6	2.6	2.4	2.3
31	1.6		1.7		2.7		2.2	2.0		2.6		2.3

Daily discharge, in second-feet, of Waihee canal near Waihee, Maui, for 1910–11.

Day.	Nov.	Dec.	Day.	Nov.	Dec.	Day.	Nov.	Dec.
1910.								
1		49	11		39	21	46	59
2		49	12		39	22	39	60
3		49	13		39	23	44	59
4		49	14		39	24	54	65
5		49	15		42	25	46	54
6		39	16		59	26	39	54
7		39	17	65	59	27	56	54
8		39	18	56	59	28	54	49
9		0	19	44	59	29	59	49
10		0	20	39	59	30	59	56
						31		59

DEPARTMENT OF THE INTERIOR
FRANKLIN K. LANE, Secretary

UNITED STATES GEOLOGICAL SURVEY
GEORGE OTIS SMITH, Director

Water-Supply Paper 445

SURFACE WATER SUPPLY OF HAWAII

JULY 1, 1915 TO JUNE 30, 1916

NATHAN C. GROVER, Chief Hydraulic Engineer
G. K. LARRISON, District Engineer

Prepared in cooperation with the
TERRITORY OF HAWAII

WASHINGTON
GOVERNMENT PRINTING OFFICE
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000052

Monthly discharge of South Waiehu Stream near Wailuku, Maui, for year ending June 30, 1916.

Month.	Discharge.				Total run-off.	
	Million gallons per day.			Second-feet (mean).	Million gallons.	Acre-feet.
	Maximum.	Minimum.	Mean.			
July	10	4.2	5.37	8.31	167	511
August	5.5	4.0	4.55	7.04	141	433
September	6.0	4.0	4.75	7.35	142	437
October	25	4.5	7.16	11.1	222	681
November	30	5.0	7.82	12.1	235	720
December	8.3	4.5	5.65	8.74	175	538
Jan. 1–17	100	5.0	19.8	30.6	336	1,030
Apr. 25-30	31	5.0	10.0	15.5	60	184
May	21	5.0	6.39	9.89	198	608
June	5.3	5.0	5.14	7.95	154	473

NORTH WAIEHU STREAM NEAR WAILUKU, MAUI.

LOCATION.—Fifty feet above uppermost diversion, 1 mile above Waihee canal crossing and about 2½ miles northwest of Wailuku.

RECORDS AVAILABLE.—July 9, 1912, to December 31, 1915. Gage washed out and station discontinued January 8, 1916.

GAGE.—Vertical staff on right bank.

DISCHARGE MEASUREMENTS.—Made by wading.

CHANNEL AND CONTROL.—One channel at all stages; stream bed very steep and rough; right bank nearly vertical rock wall; left bank high with gentle slope. Control composed of small boulders; shifting.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period of record, 4.08 feet morning of September 6, 1914 (discharge, computed from extension of rating curve, approximately 300 million gallons per day, or 460 second-feet); minimum stage recorded, 1.20 feet March 25 to 31, 1915 (discharge, 1.6 million gallons per day, or 2.5 second-feet).

DIVERSIONS.—None above station.

REGULATION.—None.

UTILIZATION.—Irrigation of sugar cane.

ACCURACY.—Gage read twice daily. Owing to unstable control satisfactory rating curves not developed and estimates poor.

Discharge measurements of North Waiehu Stream near Wailuku, Maui, during the year ending June 30, 1916.

Date.	Made by—	Gage height (feet).	Discharge.	
			Second-feet.	Million gallons per day.
Aug. 17	H. A. R. Austin	1.50	6.5	4.2
Dec. 31	C. T. Bailey	1.53	6.3	4.1

000053

Monthly discharge of North Waiehu Stream near Wailuku, Maui, for year ending June 30, 1916.

Month.	Discharge.				Total run-off.	
	Million gallons per day.			Second-feet (mean).	Million gallons.	Acre-feet.
	Maximum.	Minimum.	Mean.			
July	7.5	3.8	5.29	8.18	164	503
August	5.5	3.8	3.85	5.96	120	366
September	5.5	3.8	4.22	6.53	127	389
October	12	3.8	5.81	8.99	180	553
November	10	3.8	4.44	7.47	133	408
December	16	3.8	5.03	7.78	156	479

NOTE.—Discharge determined from poorly defined rating curve.

WAIHEE STREAM NEAR WAIHEE, MAUI.

LOCATION.—About 300 feet above intake of Waihee canal, 3 miles west of Waihee, and 7 miles northwest of Wailuku.

RECORDS AVAILABLE.—April 1, 1913, to June 30, 1916.

GAGE.—Stevens water-stage recorder installed January 15, 1916, replacing Barrett & Lawrence water-stage recorder. Datum raised 2.0 feet August 18, 1915.

DISCHARGE MEASUREMENTS.—Made by wading or from footbridge 250 feet below gage.

CHANNEL AND CONTROL.—Channel at gage is a pool at foot of low waterfall; banks, mostly of solid rock, steep and high. Control composed of boulders; fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period of record, 9 feet (new datum) estimated from gage-height of flood of January 18, 1916; no estimate of discharge possible; minimum stage recorded, 2.59 feet August 5, 1913 (discharge, 21 million gallons per day, or 32 second-feet).

Minimum stage recorded during year, 0.6 feet September 9 (discharge, 27 million gallons per day, or 42 second-feet).

DIVERSIONS.—None above station.

REGULATION.—Normal flow of stream is increased by development tunnels near headwaters.

UTILIZATION.—Irrigation of sugar cane and taro.

ACCURACY.—Record is broken on account of faulty working of recorder, but as given is good for low and medium stages.

Discharge measurements of Waihee Stream near Waihee, Maui, during the year ending June 30, 1916.

Date.	Made by—	Gage height (feet).	Discharge.	
			Second-feet.	Million gallons per day.
July 13	H. A. R. Austin	2.80	57	37
Sept. 28	do	a 1.01	113	73
Mar. 4	R. D. Klise	2.24	65	42
Apr. 11	H. A. R. Austin	2.15	56	36

Daily discharge, in million gallons, of Waihee Stream near Waihee, Maui, for the year ending June 30, 1916.

Date.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.
1	.....	37	29	68	163	41	41	48	.....	36	470	64
2	.....	34	37	12[illegible]	153	41	41	48	.....	36	410	64
3	.....	90	56	68	215	41	45	44	.....	36	194	70
4	.....	56	34	37	115	.....	62	40	130	36	410	58
5	.....	56	29	.....	76	.....	237	112	76	36	150	64
6	.....	41	29	.....	68	.....	124	48	44	36	257	58
7	.....	37	34	.....	62	.....	56	44	82	36	161	70
8	.....	37	31	.....	83	.....	503	.....	44	36	270	76
9	.....	37	27	.....	90	.....	553	.....	40	36	150	70
10	.....	34	41	.....	115	.....	124	.....	58	44	82	64
11	.....	62	83	.....	115	.....	.....	.....	44	36	70	76
12	.....	56	37	.....	62	.....	.....	.....	48	36	82	58
13	.....	37	29	.....	45	.....	.....	.....	53	36	82	58
14	41	37	34	.....	45	.....	.....	.....	244	40	70	104
15	41	34	34	.....	45	.....	45	.....	96	48	64	112
16	133	36	31	37	45	.....	45	.....	44	36	64	64
17	143	38	.....	3[illegible]	41	.....	283	.....	40	44	82	58
18	83	41	.....	90	62	.....	.....	.....	40	44	70	70
19	45	37	.....	56	143	.....	.....	.....	44	64	64	58
20	41	41	.....	106	56	.....	70	.....	40	44	82	64
21	41	34	.....	21[illegible]	62	.....	64	.....	44	70	64	112
22	41	31	.....	41	62	.....	58	.....	48	40	96	82
23	41	41	.....	6[illegible]	45	37	58	.....	48	70	121	64
24	37	45	.....	37	37	34	58	.....	44	130	70	58
25	90	37	.....	56	90	33	58	.....	48	44	82	70
26	41	34	.....	41	73	38	121	.....	40	36	64	130
27	50	29	.....	41	56	38	58	.....	40	183	64	96
28	34	29	90	15[illegible]	56	45	53	.....	40	58	70	161
29	50	29	68	124	62	37	53	.....	36	40	70	82
30	41	29	68	76	41	41	53	.....	48	58	58	76
31	37	29	.....	90	.....	41	48	.....	40	.....	70	.....

NOTE.—Discharge determined from rating curves applicable as follows: July 1, 1915, to Jan. 18, 1916, fairly well defined. Jan. 19 to June 30, 1916, well defined below 100 million gallons per day. Gage heights not recorded on days for which discharge is not given. Discharge interpolated Aug. 16 and 17 and Nov. 26.

Monthly discharge of Waihee Stream near Waihee, Maui, for the year ending June 30, 1916.

Month.	Discharge.				Total run-off.	
	Million gallons per day.			Second-feet (mean).	Million gallons.	Acre-feet.
	Maximum.	Minimum.	Mean.			
July 14–31	143	34	57.2	88.5	1,030	3,160
August	90	29	40.2	62.2	1,240	3,820
November	215	37	79.4	123	2,380	7,310
February 1–7	112	40	54.9	84.9	384	1,180
March 4–31	244	36	58.7	90.8	1,640	5,040
April	183	36	50.8	78.6	1,520	4,680
May	470	58	133	206	4,110	12,700
June	161	58	77.0	119	2,310	7,090

HONOKAHAU STREAM NEAR HONOKAHAU, MAUI.

LOCATION.—1,000 feet above intake of Honokahau ditch, about 6 miles southeast of Honokahau.

RECORDS AVAILABLE.—March 6, 1913, to June 30, 1916.

GAGE.—Stevens water-stage recorder.

DISCHARGE MEASUREMENTS.—Made by wading or from cable 400 feet below gage.

CHANNEL AND CONTROL.—One channel at all stages; straight for 100 feet below gage but makes sharp bend 50 feet above gage; right bank slopes gently; left bank is vertical wall of rock. Control composed of large boulders; seldom shifts.

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EXTREMES OF DISCHARGE.—Maximum stage recorded during period of record, 8.25 feet at 7.30 a. m. January 18, 1916 (discharge, computed from extension of rating curve, approximately 1,900 million gallons per day, or 2,940 second-feet); minimum stage recorded, 1.00 foot October 31 and October 6, 1915 (discharge, 10 million gallons per day, or 15.5 second-feet).

DIVERSIONS.—None above station.

REGULATION.—None.

UTILIZATION.—Low flow of stream all diverted by Honokahau ditch for irrigation of sugar cane and power development.

ACCURACY.—Discharge July 1 to January 18 ascertained from a well-defined rating curve and continuous gage-height record; good for all stages; results January 19 to June 30 good for low and medium stages and fair for the higher stages.

Discharge measurements of Honokahau Stream near Honokahau, Maui, during the year ending June 30, 1916.

Date.	Made by—	Gage height (feet).	Discharge.	
			Second-feet.	Million gallons per day.
July 19	H. A. R. Austin	1.43	26	17
Aug. 24	do	1.42	25	16
Sept. 21	do	1.27	19	12
Feb. 13	R. D. Klise	1.93	32	21
Apr. 17	H. A. R. Austin	2.12	46	30
June 11	do	2.13	48	31

Daily discharge, in million gallons, of Honokahau Stream near Honokahau, Maui, for the year ending June 30, 1916.

Date.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.
1	49	19	16	42	123	.....	46	19	46	19	405	42
2	18	18	20	49	76	.....	20	19	42	19	259	.....
3	16	49	49	31	176	.....	19	19	26	19	142	.....
4	18	39	26	12	28	26	26	18	56	19	238	.....
5	24	24	14	11	28	26	85	26	56	19	123	.....
6	49	22	14	10	24	117	72	39	22	19	228	.....
7	31	16	19	11	31	31	31	26	49	19	106	.....
8	42	16	13	14	56	22	405	26	24	19	192	9
9	52	14	13	28	22	20	270	24	22	19	100	34
10	20	14	20	19	60	20	85	22	26	28	36	31
11	16	22	39	14	20	20	42	22	22	19	31	19
12	19	31	13	13	20	19	26	22	24	18	36	31
13	20	20	13	13	24	19	22	24	39	18	39	28
14	19	16	.....	20	26	19	22	24	135	18	31	72
15	19	16	.....	24	19	19	22	22	85	31	28	61
16	64	13	.....	13	22	19	20	24	26	19	26	36
17	90	13	.....	31	19	20	95	24	22	26	39	31
18	39	19	.....	42	72	42	238	24	22	31	34	36
19	18	18	.....	68	49	52	142	24	26	49	34	28
20	16	19	.....	123	31	42	34	24	22	31	46	26
21	16	14	.....	20	49	36	26	24	26	56	31	72
22	16	13	22	39	34	72	24	24	39	22	52	56
23	16	14	14	22	.....	22	22	24	39	49	76	28
24	16	28	49	26	.....	20	22	24	24	72	34	24
25	52	24	31	19	.....	19	20	24	.....	31	52	39
26	22	18	36	24	.....	90	39	24	.....	24	31	90
27	34	16	31	90	.....	64	26	36	.....	106	28	56
28	18	16	64	60	.....	28	19	24	.....	36	34	123
29	18	16	60	46	.....	22	19	24	19	26	39	39
30	19	16	52	34	.....	20	19	.....	24	34	26	42
31	16	16	.....	56	.....	24	19	.....	20	.....	31	.....

NOTE.—Daily discharge determined from rating curves applicable as follows: July 1, 1915, to Jan. 18, 1916, well defined; Jan. 19 to June 30, 1916, fairly well defined. Gage heights not recorded on days for which discharge is not given.

Water Resources

Data Category: Surface Water | Geographic Area: Hawaii | go

Monthly Streamflow Statistics for Hawaii

USGS 16614000 Waihee River at Dam near Waihee, Maui, HI

Available data for this site Surface-water: Monthly streamflow statistics GO

Maui County, Hawaii
Hydrologic Unit Code 20020000
Latitude 20°56'21", Longitude 156°32'59" NAD27
Drainage area 1.20 square miles
Gage datum 605.00 feet above sea level NGVD29

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YEAR	Monthly mean streamflow, in ft^3/s											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1983											86.7	59.8
1984	77.1	80.1	49.7	69.5	49.2	43.4	54.8	46.1	32.9	27.4	36.8	31.3
1985	29.4	51.9	117	71.4	89.3	44.1	65.6	61.3	63.0	91.7	80.0	69.5
1986	59.0	49.0	158	143	134	116	89.6	91.6	57.9	89.6	94.6	75.3
1987	86.4	81.1	56.5	91.9	143	118	102	73.4	64.5	80.8	140	109
1988	186	106	97.8	106	123	73.7	78.8	77.9	55.6	55.7	76.0	89.0
1989	63.3	63.9	97.0	276	100	90.8	129	97.8	83.4	80.8	45.0	49.0
1990	86.4	82.2	94.0	56.1	84.7	69.4	82.1	78.8	75.4	90.4	150	107
1991	73.7	63.6	123	70.9	57.7	66.4	94.5	99.6	79.2	59.1	50.1	78.9
1992	50.1	49.2	43.7	36.6	45.0	49.2	94.0	79.6	160	80.1	91.3	80.7
1993	52.7	42.3	79.1	81.7	66.7	60.8	114	92.7	75.1	83.8	93.1	79.4
1994	111	98.4	179	109	72.9	102	136	95.9	108	61.9	76.6	55.9
1995	73.3	47.3	51.8	67.3	54.0	59.6	86.7	74.1	51.4	65.7	70.6	50.5
1996	57.5	75.0	94.1	85.5	41.5	49.1	57.0	49.6	48.3	35.3	69.3	68.5
1997	61.8	43.8	73.3	64.0	77.1	89.9	104	61.9	58.6	49.3	109	100
1998	58.3	53.8	46.3	93.2	77.4	102	75.2	69.4	76.7	79.0	85.4	62.3
1999	77.4	104	99.6	68.4	47.9	47.6	58.2	62.7	45.0	48.0	45.6	75.6
2000	110	49.4	54.8	79.1	47.0	49.6	62.3	81.2	90.0	83.6	81.5	52.6
2001	46.0	59.6	51.3	64.0	59.7	58.2	52.3	79.7	53.5	75.9	88.6	68.9
2002	97.3	83.3	96.6	63.4	101	64.9	85.4	72.5	55.3			

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Mean of monthly streamflows	76.7	67.6	87.5	89.3	77.4	71.3	85.3	76.1	70.2	68.8	82.6	71.7

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