UNITED STATES DEPARTMENT OF THE INTERIOR
Ray Lyman Wilbur, Secretary
GEOLOGICAL SURVEY
George Otis Smith, Director

Water-Supply Paper 637—A

SURFACE WATER SUPPLY OF MINOR SAN FRANCISCO BAY, NORTHERN PACIFIC AND GREAT BASINS IN CALIFORNIA, 1895–1927

BY

H. D. McGLASHAN

Prepared in cooperation with
THE STATE OF CALIFORNIA

Contributions to the hydrology of the United States, 1930
(Pages 1–68)

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1930

For sale by the Superintendent of Documents, Washington, D. C. - - - - - Price 10 cents

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CONTRIBUTIONS TO THE HYDROLOGY OF THE UNITED STATES, 1930

N. C. GROVER, Chief Hydraulic Engineer

SURFACE WATER SUPPLY OF MINOR SAN FRANCISCO BAY, NORTHERN PACIFIC, AND GREAT BASINS IN CALIFORNIA, 1895–1927

By H. D. MCGLASHAN

INTRODUCTION

The measurement of the flow of the streams in California was begun by the State engineer in 1878, in accordance with the law requiring him "to investigate the problems of the irrigation of the plains, the condition and capacity of the great drainage lines of the State, and the improvement of the navigation of rivers." The work was restricted to a few localities in the Sacramento and San Joaquin River Basins, the principal station being on the Sacramento at Collinsville.

The State engineer's office was discontinued in 1884, and practically no further stream studies were made in California until 1894, when engineers of the United States Geological Survey made a few measurements of streams in the semiarid parts of the State. The following year the Geological Survey established a station on the Truckee River at Tahoe, and since that time it has gradually extended the work, as funds were made available, until it now has records of flow at a large number of points on California streams.

The records to June 30, 1912, for the drainage basins included in this report were published in Water-Supply Paper 300. Subsequent records are contained in the annual series of water-supply papers as follows:

	Water-Supply Papers		Water-Supply Papers		Water-Supply Papers
1912	330, 331	1917	460, 461	1923	570, 571
1913	360, 361	1918	480, 481	1924	590, 591
1914	390, 391	1919–20	510, 511	1925	610, 611
1915	410, 411	1921	530, 531	1926	630, 631
1916	440, 441	1922	550, 551	1927	650, 651

Although a few of these papers are out of print, most of them can be bought from the Superintendent of Documents, Government Printing Office, Washington, D. C., or they may be consulted at the Geological Survey offices at 303 Customhouse, San Francisco, and 600 Federal Building, Los Angeles, and at the public libraries in the principal cities.

The records are summarized in this paper to make them readily available for reference. For detailed information of daily discharge, run-off in acre-feet, and station descriptions giving full information regarding location and equipment of stations and other pertinent information, reference should be made to the above-mentioned water-supply papers or to the files at the Geological Survey offices.

COOPERATION AND ACKNOWLEDGMENTS

Cooperation in stream measurements between the United States Geological Survey and the State of California was first provided for by the State legislature in an act approved March 16, 1903. Similar acts continued the cooperation until April 22, 1909, when an act placing cooperation between the State and the United States Geological Survey on a permanent basis was approved. This act provided as follows:

> The department of engineering is hereby empowered to carry on topographic surveys and investigations into matters pertaining to the water resources of the State along the lines of hydrography, hydroeconomics, and the use and distribution of water for agricultural purposes, and to that end, where possible and to the best interest of the State, shall enter into contracts for cooperation with the different departments of the Federal Government in such amounts as may be an equitable and necessary division of the work. The State engineer, with the consent of the governor, may maintain and continue such investigations where there is available money not covered by cooperation contract. For the permanent maintenance of said surveys and investigations there is hereby continuously appropriated out of the general fund of the State treasury for each and every fiscal year, commencing with the date upon which this act becomes effective, the sum of $30,000.

Of this sum $9,000 was allotted annually to investigations of water resources. To supplement this fund and the Federal appropriation, the State conservation commission, State board of control (water powers), State water commission, and later the department of public works through the divisions of engineering and irrigation and water rights have allotted additional money.

The State budget for 1928 and 1929 groups all State cooperation with the Geological Survey for investigations of water resources and provides a fund of $25,000 a year for the biennium. This cooperation is disbursed by the division of engineering and irrigation, department of public works, through Edward Hyatt, jr., State engineer.

The earliest stream gaging in the State was done under the direction of William Ham. Hall, State engineer, by C. E. Grunsky, who

continued in charge until the State engineer's department was abolished. Work by the United States Geological Survey was begun in 1894, under the direction of F. H. Newell, chief hydrographer, by Arthur P. Davis and Joseph B. Lippincott. On the establishment of the United States Reclamation Service, in 1902, Mr. Lippincott became supervising engineer for California, and the field work was continued under his direction by William B. Clapp and Samuel G. Bennett, until the separation of the Reclamation Service from the Geological Survey in 1906, when Mr. Clapp became district engineer. On Mr. Clapp's death in December, 1911, H. D. McGlashan was appointed district engineer.

Much cooperation and many records have been furnished by other Federal bureaus, counties, municipalities, irrigation districts, permittees and licensees of the Federal Power Commission, private companies, and individuals, to whom credit is given in the annual series of water-supply papers.

MINOR SAN FRANCISCO BAY BASINS

COYOTE RIVER BASIN

The Coyote River rises on the sparsely wooded slopes of Pine Ridge on the east side of Santa Clara Valley. The surface of the drainage basin above the mouth of the canyon, opposite Madrone, is rough, and a considerable part of it has an altitude of more than 2,000 feet. The course of the Coyote River is peculiar in that three times on its way out of the mountains it doubles on itself by sharp turns. After leaving the mountains it hugs the east side of Santa Clara Valley for 7 or 8 miles and then passes through what is known as the lower gorge, about a mile below the station at Coyote. Here the Santa Clara Valley narrows to only 1,200 feet. Between 4 and 5 miles farther downstream the river passes behind the point of a projecting hill through what is known as The Narrows. Below The Narrows the valley recedes eastward, leaving the Coyote River 3 or 4 miles from its side. The stream continues its course through the broad level floor of the valley for about 18 miles and then enters the south end of San Francisco Bay.

ALAMEDA CREEK BASIN

Alameda Creek rises on the northern slope of Packard Ridge in Santa Clara County, 4 miles north of Mount Hamilton, at an altitude of 3,000 feet. The stream flows northwestward through Alameda County to the lower end of Sunol Valley, where it turns westward, follows Alameda Canyon for 6 miles to Niles, and enters San Francisco Bay 4 miles west of Alvarado.

The principal tributaries are Calaveras Creek, now regulated by the Spring Valley Water Co.'s reservoir at the outlet of Calaveras

Valley; San Antonio Creek, which drains La Costa Valley on the east; and Arroyo de la Laguna, which with its tributaries—Alamo Creek, Tassajero Creek, Arroyo Mocho, Arroyo las Positas, and Arroyo del Valle—drains Livermore and Amador Valleys. At the head of Alameda Canyon is the infiltration gallery of the Spring Valley Water Co., which supplies the aqueduct that serves the city of San Francisco.

The drainage area of Alameda Creek above the head of the débris cone at the mouth of the canyon at Niles is 634 square miles. Along the débris cone are many wells that furnish water for the irrigation of truck gardens and orchards. These wells receive their main supply through percolation from Alameda Creek.

SAN PABLO CREEK BASIN

San Pablo Creek rises near the western boundary of Contra Costa County, east of the Berkeley Hills, flows northwestward east of and parallel to San Pablo Ridge, and enters San Pablo Bay about 2½ miles west of San Pablo. An earth dam across San Pablo Creek in the canyon above San Pablo provides nearly complete regulation of this stream. This reservoir forms a part of the water-supply system of the eastern Bay cities.

NORTHERN PACIFIC BASINS

The principal streams that enter the Pacific Ocean in California north of San Francisco Bay are the Russian, Eel, Mad, Klamath, and Smith Rivers.

RUSSIAN RIVER BASIN

The Russian River rises in the eastern part of Mendocino County, on the western slope of the Coast Range, and flows southeastward to its junction with Santa Rosa Creek in Sonoma County, where it turns westward and enters the canyon through which it flows to the Pacific Ocean. The total length of the main river is about 100 miles.

The principal tributaries of the Russian River are the East Fork, Big Sulphur Creek, Dry Creek, Santa Rosa Creek, and Austin Creek—all very small except during the rainy season.

The Russian River Valley, in Sonoma County, is fertile and well cultivated. The climate is very equable throughout the year, and fruit raising is the important industry.

EEL RIVER BASIN

The Eel River rises on the western slope of the Coast Range, in the California National Forest, and drains parts of Lake, Trinity, Mendocino, and Humboldt Counties. From its junction with the Middle Eel at Two Rivers it flows northwestward about 110 miles to the Pacific Ocean. The principal tributaries below Two Rivers are the North Fork, the South Fork, and the Van Duzen River.

The lower part of the drainage area, below the mouth of the South Fork, is in the redwood belt. The remainder of the area is semiopen and contains very little merchantable timber except on a small tract near Grizzly Mountain. The lowlands are very fertile and well cultivated. The rolling and hilly lands are covered with grass and are used only for grazing.

The precipitation throughout the drainage area is very heavy during the winter.

MAD RIVER BASIN

The Mad River rises in the southern part of Trinity County and flows northwestward across Humboldt County to the Pacific Ocean. Its total length is about 90 miles.

The basin is very narrow, and the tributaries are small. The upper and lower parts contain good agricultural land; the middle part is suitable only for grazing.

During the rainy season the river is turbulent. In the upper part of its course its channel is practically dry during the summer, the water standing in pools; farther down flow continues throughout the year but is insufficient to irrigate all the land that is improved.

The lower course of the river is through the famous redwood belt; the upper part of the basin has only a fair forest cover consisting of scrubby timber without much brush.

KLAMATH RIVER BASIN

The Klamath River drains a territory lying east of the Cascade Range in south-central Oregon and south of the Siskiyou Mountains in California. The river rises in Upper Klamath Lake, flows generally southwestward, and empties into the Pacific Ocean at Requa, on the coast of northern California. Only that part of the basin lying in Oregon has been studied in detail. The drainage from this part of the area is collected in large lakes whose margins are wide, shallow marsh lands covered with tules and aquatic plants. From Upper Klamath Lake, which lies 4,141 feet above sea level, flows the Link River, a stream 1¼ miles long, discharging into Lake Ewauna at an altitude of 4,080 feet. Klamath Falls, the principal city of this section, is situated on the Link River. From Lake Ewauna to the town of Keno, a distance of 20 miles, the Klamath River flows through a flat, marshy country. About 5 miles above Keno the river is connected with Lower Klamath Lake by a channel known as Klamath Straits. About half a mile below Keno the river breaks over a rocky ledge and here begins its precipitous fall of 100 to 200 feet a mile to its mouth. The drainage area above Keno, exclusive of Lower Klamath Lake, is 3,150 square miles. The streams draining into Upper Klamath Lake rise about 6,000 feet above sea level. The altitude of Klamath Falls is 4,100 feet.

The principal tributaries of the Klamath River are the Sprague River, which drains the southwestern edge of the Great Basin divide in Oregon, and the Anna River, which heads in a large spring supposed to be fed by the waters of Crater Lake. The Williamson River, which drains the northern part of the Klamath Indian Reservation, is tributary to the Sprague River. The Lost River, although not a tributary of the Klamath, is usually considered with it, as a slough connects the two. Water formerly flowed either way, the direction depending on the heights of the streams, but the flow is now stopped by an artificial dike.

The mean annual rainfall at Klamath Falls, about 12 inches, fairly represents this section of the drainage area. A large part of this precipitation occurs as snow. As nearly all the streams are spring-fed and therefore rarely freeze, records of stream flow are little affected by ice.

Irrigation is practiced extensively in the upper part of the area, although dry farming has been fairly successful. The agricultural products consist chiefly of forage crops for stock and cattle, the country being well adapted to stock raising. Grains, alfalfa, and the hardier vegetables and fruits are grown with some success, but the climate is too rigorous for the intensive agriculture that is possible at lower altitudes.

SMITH RIVER BASIN

The Smith River is formed in Del Norte County, Calif., in the western part of T. 17 N., R. 2 E., Humboldt base and meridian, by the junction of its Middle and North Forks. The Middle Fork, which drains the larger area and is therefore considered the continuation of the main stream, rises on the western slope of the Siskiyou Mountains in the central part of T. 17 N., R. 5 E., flows northwestward 5 miles, then southwestward to the point at which it receives the North Fork. Below these forks the main river continues southwestward to the north-central part of T. 16 N., R. 1 E., where it turns abruptly to the west, and thence flows westward and northwestward to the Pacific, in T. 18 N., R. 1 W. The length from the mouth to the head of the Middle Fork is about 45 miles; the principal tributaries of the Middle Fork are Preston and Patrick Creeks.

The North Fork of the Smith River rises in the extreme southwestern part of Josephine County, Oreg., and flows somewhat west of south into Del Norte County, Calif. Its length, including major windings, is about 20 miles; the principal tributary is Stony Creek.

The South Fork, the principal tributary below the junction of the North and Middle Forks, rises on the western slope of the Siskiyou Mountains, in the northern part of T. 16 N., R. 4 E., Humboldt base and meridian, flows southwestward about 12 miles, then northwestward to its junction with the Smith River in the northern part of

T. 16 N., R. 1 E. Including its major windings this fork is 32 miles long. Its principal tributaries are Quartz, Jones, Hurdy Gurdy, Gorton, and Coon Creeks from the north and Goose and Rock Creeks from the south.

GREAT BASIN

SALTON SINK BASIN

The Salton Sink originally formed a part of the Colorado Desert, which has an area of nearly 2,000 square miles and extends northwestward almost 100 miles from the California-Mexico boundary line. It comprises two fertile valleys, one northwest of the sink, in Riverside County, known as the Coachella Valley, and the other southeast of the sink, in Imperial County, called the Imperial Valley. The Salton Sea, which now partly fills the sink, lies between the two valleys and is partly in Riverside County and partly in Imperial County. The longest diameter of the sea has a northwest-southeast direction. On December 31, 1908, its surface was 206 feet below mean sea level, and it had a length of nearly 45 miles, a maximum width of about 15 miles, a minimum width of 9.5 miles, a maximum depth of 67.5 feet, and a superficial area of about 443 square miles. In February, 1925, the surface of the sea was 249.6 feet below sea level and the area was 265 square miles. It is about 160 miles southeast of Los Angeles, 90 miles northwest of Yuma, and 50 miles north of Calexico.

A few thousand years ago, according to geologic evidence, what is now the Salton Sea was a part of the Gulf of California, which then extended about 200 miles farther northwest than at present. It is probable that the gulf waters then swept inland to the base, or nearly to the base, of San Jacinto Peak, although all evidence that would enable their exact limits to be fixed has been obliterated by more recent geologic events. At that time the mouth of the Colorado River was in the vicinity of Yuma, 60 miles in an air line north of its present location. Presumably, then as now, it was discharging large quantities of silt each year, cut from the great canyons of the upper Colorado and the Gila Valley and carried to the Gulf. Running water will carry in suspension matter that quickly settles in still water, and here the settling process is aided by the clarifying effect of the salt water.

As a result of these processes the Colorado delta was gradually extended southwestward toward the Cocopa Mountains, and when it reached them it had separated the old gulf into the present gulf and an inland sea. Delta growth, however, did not cease with the separation of the water body into two parts. Silt continued to be brought down the stream and to be deposited in its bed, along its banks, and in the still waters at its mouth. A stream by this process

of deposition eventually builds its channel up until it is higher than the lands adjacent on both sides. The stream is then in a condition of unstable equilibrium, and at some favorable time, as during an exceptional flood, it will break out of its immediate banks and flow in some less restricted course. By this process, often repeated, it comes eventually to flow over all parts of its delta, building up each part in succession. By such a process the Colorado must have discharged alternately into the Gulf and into the depression now known as the Salton Sink, meanwhile building up the delta dam that separates them until it reached a height of about 40 feet above sea level. It is highly probable that during this process water filled the Salton depression and evaporated from it many times, for it must have quickly disappeared whenever the erratic river changed its course to the Gulf, the run-off from the mountains that surround the sink being too slight to maintain a permanent body of water in this region of intense evaporation. Meanwhile the original body of salt water that occupied the sink had been displaced by the volumes of fresh water poured into it from the river, and in the intermediate stages of the lake's existence, at least, its water was fresh or nearly fresh. A clear and definite indication of the last occupancy of this depression by a lake, presumably just before the river had shifted to the course that it now follows to the Gulf, may be seen in the remarkably well preserved old water line that rims the desert from Indio to the Cerro Prieto at a height of 40 feet above sea level. On the rocky points that projected into the lake this water line is marked by a thick deposit of calcium carbonate, by slightly cut sea cliffs, and by a change in the profile of the rocky spurs. Where alluvial cones and the sandy floor of the desert formed the shore line, beaches have been developed, and although of soft sand and easily eroded, they are even now well preserved, thus testifying to the recency of the action that produced them. Over the floor of the desert and along the sandy beaches are myriads of shells of fresh or brackish water mollusks[1] that lived in the lake.

There are some reasons for thinking that the lake at this latest stage was not perfectly fresh—at least that its waters were distinctly "hard." Its area when it stood at 40 feet above sea level was somewhat in excess of 2,100 square miles. The average flow of the Colorado has been determined from records for 1903–1925 at Yuma as about 16,800,000 acre-feet a year. The evaporation from a surface of the area of the old lake, under the conditions that prevail here, has never been determined but is undoubtedly high. If it is as high as 8 feet a year, it would nearly equal the average annual inflow from the Colorado; if it is but 7 feet a year, the average inflow would exceed

[1] Stearns, R. E. C., Remarks on fossil shells from the Colorado Desert: Am. Naturalist, vol. 13, pp. 141–154, 1879.

the evaporation by 2,000 second-feet, or somewhat less than 14 per cent of the inflow. In either event, the waters of the lake would be markedly more alkaline after a term of years than those of the Colorado. The calcium carbonate incrustations on the rocky points about the shores of the old lake are best explained by supposing that the lake waters contained large quantities of this salt, so that wherever they broke in spray and evaporated more rapidly than usual, the carbonate was deposited. This necessary excess of inflow over outflow at the period of maximum area of the lake, taken in connection with the thick calcium carbonate incrustations on the shores, indicates distinctly hard water. It may be assumed that other salts than calcium carbonate were also present in large amount, for the conditions that would lead to the abundance of one salt would also lead to an abundance of the others. The shells so thickly distributed over the desert floor, however, are not salt-water forms, but are identical with those of creatures now living in the springs and occasional permanent streams about the desert borders. Many of these springs and streams are somewhat brackish, and the creatures flourish in them. It seems probable, then, that the lake waters also were rather alkaline, perhaps even brackish, at the time the lake attained its maximum area.

The period at which this lake disappeared can not be precisely fixed. The time units of geology are too large and too indefinite to translate satisfactorily into years, so that when we say that the disappearance of the lake is the most recent of geologic events we still leave the mind groping for a definite human standard of time. The sandy beaches that mark the borders of the ancient lake are cut away where washes cross them from the mountains, but in sheltered places they are still perfect. Where they stretch across an embayment from one rocky point to another they are mere embankments of sand, old barrier beaches, with depressions behind them once occupied by shallow lagoons. In other areas, where they contour the alluvial cones, they are gullied and cut away where streams have flowed across them but in other places are preserved unscarred. At one locality a low sea cliff that had been cut in alluvial-fan material was still preserved, although the loose sand and boulders would slump in a few heavy storms.

In a region of abundant rainfall such ephemeral forms as these would be more nearly obliterated within 50 years after the lake had disappeared than they are now in the desert. In such a region the precipitation is twenty times that of the desert. It is the crudest of estimates—merely a guess, in fact—to state that, reasoning from geologic evidence alone, it may be a thousand years since the lake disappeared, yet it puts in concrete form such a guess as the geologist

is able to make, and this guess may be correct within a margin of error of 50 per cent.

When human records are studied some evidence on this point is found, but it is almost as uncertain as to time as that furnished by the physical features. The Indians in the Coachella Valley have distinct legends to the effect that at some time in the past the valley was occupied by a large body of water. Professor Blake records that they told him of a time when a great body of water existed in which were many fish, and of the manner in which that water disappeared "poco á poco" (little by little) until the lake became dry.

The Indians now living in the desert put this event as far back as the lives of four or five very old men, say, four or five centuries ago at the most. There are, of course, no records, and there is no known check on this assertion. Statements by Indians as to time, beyond the limits spanned by their own memories, are notoriously inaccurate. Furthermore, we do not know the means used to procure this statement. The native races are usually very prone to follow the suggestions contained in leading questions and so to give the answer desired by the questioner. To obtain an entirely independent and unguided answer is one of the most delicate of tasks. Yet their statement has some value, and combining the evidence of the physical conditions and the Indian legends we may say that it is probable that the lake disappeared and left the desert, as we have known it in historical time, from five hundred to one thousand years ago.

During the summer of 1891 the high water in the Colorado overflowed into Salton Sink to such an extent as to endanger the Southern Pacific Railroad at its lowest point. In the summer of 1905, after a succession of winter and spring floods in the Gila River, followed by an exceptionally heavy summer flow in the Colorado, there was a repetition of flood conditions in the sink on a much larger scale.

The gravity of the situation at this later time, however, was greatly augmented by the interference of man. For several years preceding a small quantity of water had been diverted from the Colorado below Yuma, Ariz., to be used by the settlers of the Imperial Valley for irrigation and domestic supply. The first water was diverted in the United States and conveyed to the Imperial Valley, after passing through Mexican territory, by means of an old river channel which had been one of the Colorado's distributaries during the formation of its delta and is now known as the Alamo River. The increased demand for water and the silting up of the original canal heading above the boundary line necessitated the cutting of an additional channel from the river below the boundary to connect with the canal. It likewise silted up, and to supply the urgent need for water a canal was cut 4 miles below the original heading to connect the Colorado and Alamo Rivers. This canal was not provided with protective

headworks and had a gradient much greater than that of the river, so that with the unusual and prolonged summer flood in 1905, it began cutting, until in July it was carrying 87 per cent of the total flow of the river. This large quantity of water flooded several hundred square miles about Calexico, in the southern part of the Imperial Valley, and caused serious loss both in the United States and in Mexico. These waters ultimately reached the Salton Sea, but in so doing they deepened and widened the Alamo River into a great gorge and developed another drainage channel to the west through Imperial Valley in a second gorge now called the New River. Notwithstanding all attempts to control it the Colorado continued to pour its waters through the Alamo and New Rivers into the Salton Sea until the early fall of 1906, when it was finally shut off by the Southern Pacific Co. It broke again, however, on December 7, but was closed about two months later. Accounts of these operations have been published in the Transactions of the American Society of Civil Engineers, the Engineering News, and other engineering publications. In addition to the damage done to the railroad the sea completely submerged the plant of the New Liverpool Salt Co. below Mecca and a few ranches in the vicinity of Mecca.

There is some uncertainty as to the altitude of the lowest point of Salton Sink, and it is now believed that the depth below sea level has been overestimated in the past. From the record of the depth of the water as it filled the lowest portion of the basin, as kept by the New Liverpool Salt Co., it appears that the maximum depth of water was 17 feet on October 4, 1905 (according to the gage and as checked by soundings later), when on the same date the water surface just covered the United States Geological Survey bench mark a few feet from the old Salton railway station. As this bench mark is 256.5 feet below mean sea level, it would appear that the lowest point of the sink is 273.5 feet below mean sea level instead of 287 feet, which has been accepted heretofore. In 1891 Southern Pacific engineers reported the lowest point in the sink as −280.2 feet, which corresponds to −273.4 feet, United States Geological Survey.

Practically all the water that enters the Salton Sea is received through the Alamo and New Rivers, chiefly through the Alamo. These rivers run through Imperial Valley and are the drainage channels for all the excess and waste water from the irrigation system.

OWENS LAKE BASIN

Owens Lake is a body of saline water, covering about 75 square miles, in the central part of Inyo County. Like Mono Lake, which lies 125 miles farther north and about 3,000 feet higher, it derives its water from the vicinity of Mount Lyell.

The lake is fed by the Owens River, which rises among the high peaks of the Sierra east of Mount Lyell and directly opposite the headwaters of the San Joaquin, at an altitude of nearly 12,000 feet. It flows eastward into Long Valley, thence southeastward through the Owens River Canyon into Owens Valley, thence eastward and southward through the trough of the valley to Owens Lake, about 20 miles southeast of Mount Whitney. The total length of the river is about 125 miles—45 miles above the lower end of the canyon and 80 miles in Owens Valley.

The basin is long and comparatively narrow, and its topography is varied. It comprises a rough mountain slope 5 or 6 miles wide on its east side, a valley floor about 6 miles wide, and a slope 6 to 10 miles or more wide on the west. The west-side area is made up of a very rugged and precipitous mountain slope 4 or 5 miles wide and an alluvial plain composed of delta-fan surfaces, ranging in width from 1 to 5 miles and sloping down to the valley floor. Owens Valley is smooth and ranges in altitude from 3,600 feet at the south end to about 4,100 feet at the north end. The crest of the range of mountains on the east averages about 6,000 feet higher than the valley floor. The west-side plain consists of a porous granitic alluvium of considerable depth and ranges in altitude from about 4,000 feet at the west edge of the valley to about 6,000 feet at the foot of the mountains. It has a fairly uniform slope of 400 to 600 feet to the mile. The eastern slope of the Sierra is very steep and rugged and ranges in altitude from about 6,000 feet at the foot to 13,000 or 14,000 feet at the crest. The geologic formation is granitic.

The basin is poorly forested. The eastern slope is practically barren of vegetation, except in places where there is a scanty desert growth. The western slope has a very slight soil covering and only a sparse timber growth, found chiefly along the watercourses. All the western slope, a large part of the eastern slope, and the central part of Owens Valley are included in national forests.

The only precipitation records available indicate that the mean annual precipitation in the valley is about 5 inches. On the Sierra slope precipitation probably increases northward and certainly increases with increase in altitude. On the higher slopes it may reach 40 inches or more and falls almost entirely as snow.

The Owens River has many tributaries. More than 40 lateral streams, many of them, however, comparatively small, drain a part of the eastern slope of the Sierra and enter the main stream from the west. The principal tributaries, in order from north to south, are Rock, Pine, Horton, McGee, Birch, and Bishop Creeks opposite the San Joaquin Basin; Coyote, Baker, Big Pine, Birch, Tinemaha, Taboose, Goodale, Division, Sawmill (Eightmile), Thibaut, Oak, Pine, and Symmes Creeks opposite the Kings River Basin; and

Shepard, Bairs (Moffett), George, Hogback, Lone Pine, Tuttle, Richter, Cottonwood, and Ash Creeks opposite the Kern River Basin. No water enters the Owens River from the east except during the rare exceptionally heavy rainstorms.

Nearly all the streams rise in glacial lakelets and marshes, which lie near the crest of the Sierra and serve to a certain extent as storage reservoirs in regulating the flow. The streams emerge from the mouths of their canyons upon the porous alluvial plain at the base of the Sierra, across which they flow to the river. The porous alluvial belt permits considerable loss, part of which feeds many springs throughout the valley. Perhaps stronger evidence of the great loss by seepage is afforded by the broad belt of somewhat boggy land that extends over a large part of the trough of the basin. Undoubtedly large quantities of water can be obtained by sinking wells within this area. Several artesian wells that have been sunk in the vicinity of Independence yield a strong flow and give convincing evidence of an artesian belt in the valley. With a view to the greatest ultimate utilization of the valley's water supply, the city of Los Angeles has conducted special investigations to determine the depth to and fluctuations in the ground-water plane and the rate of evaporation from free water surface and saturated gravel near Independence;[2] also to determine the amount of precipitation on the alluvial plain at the base of the Sierra between the 4,000 and 6,000 foot contours and the seepage losses of creeks crossing it.

Owens Valley is extensively cultivated and particularly adapted to stock raising. Numerous diversions are made for irrigation at different points on the Owens River and its tributaries, particularly in the upper part of the valley. Considerable water is also used for irrigating meadow lands in Long Valley north of the Owens River Canyon, but it is returned to the river above the head of Owens Valley.

ANTELOPE VALLEY BASIN[3]

Antelope Valley is in the southwestern part of the Mohave Desert, between the rugged mass of the San Gabriel Range and the northwest end of the San Bernardino Range on the south and the Tehachapi Range on the west.

The lowest part of this depression, lying at an altitude of about 2,300 feet, is occupied by Rosamond, Buckhorn, and Rogers Dry Lakes, and the surface of the valley slopes toward this area with a grade that decreases with distance from the mountains. The margin of the valley lands ranges in altitude from 2,600 feet along the south foot of the Rosamond Buttes to more than 4,000 feet on the Tehachapi flanks. The valley is an undulating brush-covered plain, except for

[2] See U. S. Geol. Survey Water-Supply Paper 294, 1912.

[3] From Johnson, H. R., Water resources of Antelope Valley, Calif.: U. S. Geol. Survey Water-Supply Paper 278, 1911, to which the reader is referred for more detailed information.

barren steep-sided buttes and ridges, which rise island-like above the level land and which are typified by the Sand Hills, just southwest of Cottonwood Creek Wash; Antelope Buttes, near Fairmont; Little Buttes, about halfway across the valley between Del Sur and Willow Springs; Quartz Hill, about 5 miles southwest of Lancaster; a butte at the northwest end of Buckhorn Dry Lake; and, in the eastern part of the valley, many sand dunes.

Although in its general features Antelope Valley resembles the Mohave Desert, its position at the immediate base of the Tehachapi Range and Sierra Madre modifies favorably the amount and quality of the waters which reach the lowlands. Some of the streams flowing from these higher ranges are perennial, and all supply better water than the smaller streams that flow from the buttes of the desert proper. The two ranges are so high that their snow cover often remains until midsummer and maintains a continuous though gradually diminishing flow of water, but the region is prevented by its position on the landward side of the ranges from receiving the benefit of the heavy winter precipitation and consequent heavy run-off of the more favored southern and western slopes.

In general the streams of Antelope Valley flow at right angles to the trend of the mountains in which they originate; most of these streams converge toward Oban and thence, though their channels are less clearly defined, sweep northeastward and empty into Rosamond Dry Lake or its extensions, Buckhorn and Rogers Dry Lakes.

None of the streams in the valley are large. On the northern slope of the San Gabriel Range and the southeastern slope of the Tehachapi a few have worked their way back far enough into the ranges to become important as water carriers. Of these Rock, Little Rock, and Amargosa Creeks are the largest.

The main fork of Rock Creek rises in the rugged region north of North Baldy, at an altitude of 6,500 feet, and the uppermost tributaries of its south branch, which drains the region immediately north of Mount Islop, head at an altitude of fully 8,000 feet. The creek flows northwestward past the Shoemaker ranch to the northwest corner of T. 4 N., R. 9 W., where it turns northward to the gravelly margin of Antelope Valley. Here it breaks into several distributaries, which diverge from the apex of the alluvial fan built up by the stream itself. The more or less constant flow of Rock Creek is utilized by irrigation canals that extend for some distance east and west from the mouth of the canyon.

Little Rock Creek, which rises in the high granitic mountain country in T. 3 N., R. 10 W., flows northwestward and enters Antelope Valley near Little Rock, in the northeast quarter of T. 5 N., R. 11 W. The channel of this creek in Antelope Valley is better preserved than that of any of the other streams, and it is traceable almost to C. N.

Reid's ranch, nearly 7 miles east of Lancaster. Here, however, the channel begins to lose its character and is not easily followed farther toward Rosamond Dry Lake. The waters of this stream are used to irrigate lands adjacent to the settlement of Little Rock.

Amargosa Creek, which enters Antelope Valley about 3 miles west of Palmdale, is the only stream with even moderate flow between Little Rock Creek and the extreme west end of Antelope Valley.

A number of streams which, though draining rather small areas, carry considerable water, rise at the west end of Antelope Valley, between the junction of the Tehachapi and San Gabriel Ranges. They are fed by copious springs, which are particularly numerous at the southwest end of the Tehachapi Range, near the foot of the steep slopes. The largest of these creeks is called Little Cottonwood. No accurate measurements of any of these springs or creeks are available, but the large spring at the Liebre ranch is said to flow 1,500 gallons an hour.

Between Little Cottonwood and Cottonwood Creeks are Fish, Livsey, Tierra Seca, and Little Oak Creeks, each less than 5 miles long but a source of considerable water even in summer. It is stated that the drainage basins of these streams contain large springs which furnish much of the stream water that eventually finds its way into the gravel in this part of the Antelope Valley.

Cottonwood Creek, the largest stream flowing into Antelope Valley from the Tehachapi Range, rises at an altitude of more than 6,000 feet at a point some 8 miles west of the Knecht ranch, which is practically at the apex of the great alluvial fan built by this stream below the mouth of its canyon. Since this fan was deposited the erosional ability of the creek has been changed, either through uplift or climatic oscillations, so that it has carved a sharply defined gulch in its own fan.

Lakes and ponds, most of them intermittent, exist at a number of points in and near Antelope Valley. The most permanent—Hughes and Elizabeth Lakes—lie in depressions in an alluvial trough coinciding with the San Andreas fault zone. Elizabeth Lake receives the drainage of a small area in the surrounding hills and may be fed by springs. Its waters remain fairly fresh, however, for at the northwest end it overflows occasionally through a meandering channel into the smaller Hughes Lake, which in turn feeds the headwaters of a southward-flowing stream that is a part of the Santa Clara drainage system.

Intermittent lakes of another type are formed in the lowest portions of the broader alluvial basins by the addition of flood waters from the surrounding drainage area that have not been absorbed on the way by the gravel of the basin. In this arid region such waters, combined with those due to upward leakage, usually hold in solution

considerable saline material and on their evaporation leave the salts as an incrustation within and about the margin of the dry lakes. These lake or "playa" deposits are nearly level and form a smooth, hard surface which, as in Rogers Dry Lake, extends for many miles. Except during the hardest storms the lakes rarely contain water, unless the ground-water plane approaches sufficiently near the surface to produce small scattered pools and damp spots of alkali-charged waters. Several such lakes of minor extent occur southeast of Antelope Valley.

MOHAVE RIVER BASIN

The Mohave River rises in San Bernardino County, Calif., on the northern slope of the Sierra Madre, its headwaters flowing from altitudes of 5,000 to 8,000 feet above sea level. It takes a circuitous course, winding successively to the west, north, and east, decreases in volume as it passes onto the plains, and finally disappears in the sandy bed a short distance below Barstow, at an altitude of 1,900 feet. As measured by planimeter on the San Bernardino County map, the basin comprises 1,470 square miles, of which 251 square miles may be classed as mountains, 219 square miles as foothills, and 1,000 square miles as plains and desert buttes.[4]

Many of the mountains on the west drain toward the Mohave Desert, but the streams are few and small and the water disappears as soon as it reaches the hot sands. The general slope of the valley from the west is toward the Mohave River at the rate of 2 feet to the mile, but the rainfall is so light—about 3 inches a year—and the summer heat is so great that the run-off is not visible on the surface. In the mountains of the basin heavy rains are frequent, and, falling on slopes that are both rugged and steep, they make floods that pour out of the hills far beyond the limit of the surface flow into the desert, fill the porous sand and gravel of the river beds, and then disappear as rapidly as they come.

South of Victorville, at a point known as The Narrows, the river has cut through a low range of hills. The gorge is narrow and its bounding walls are abrupt granite cliffs.

MONO LAKE BASIN

Mono Lake lies at the eastern base of the Sierra Nevada in east-central California, within a few miles of the California-Nevada boundary. The western rim of its drainage area, formed by the crest line of the Sierra, coincides for 36 miles with the western margin of the Great Basin.

The lake is 6,412 feet above the sea. The lowest pass in the serrate mountain crest along its western border is 3,000 feet above its surface. The highest peaks that overshadow it rise more than 6,000 feet above

[4] U. S. Geol. Survey Nineteenth Ann. Rept., pt. 4, pp. 14-16, 1898.

the level of the lake. The eastern portion of the basin partakes of the character of the arid interior region and includes valleys covered with sagebrush and rugged mountain slopes scantily clothed with cedar and piñon. Over this portion no running water can be found during the greater part of the year. That it is not really a desert is shown by the fact that among the clumps of sagebrush it produces nutritious bunch grass in sufficient abundance to afford pasturage for a few cattle and horses.

The southwestern border of the basin includes magnificent mountains that are clothed in favored places with forests of pine. The highest peaks reach far above the timber line and bear a varied and beautiful alpine flora.

The lake derives its principal water supply from the creeks that descend the eastern slope of the Sierra and empty into it from the south and west. The surface drainage is supplemented by a number of springs, some of which are of considerable size.

The creeks tributary to Lake Mono are clear and flow through channels excavated for the most part in granite and metamorphosed sediments, but near their mouths they have eroded small gorges through material deposited during previous high-water stages of the lake. No chemical analyses of these waters have been made, but they undoubtedly hold a small percentage of mineral matter in solution, which is left when evaporation takes place.

Most of the springs of the basin are either in the bottom of the lake or near its shores, and they are most numerous near the base of the mountains, which lie close to the western shore. Only three of those that rise on the land have a temperature noticeably above the normal. The character of most of those rising in the bottom of the lake is uncertain. Some of them reveal their presence in cold weather by vapor, seen on the lake surface above them, and are thus known to be thermal. None of the springs of the basin are highly charged with mineral matter; on the contrary, some of the more copious are remarkable for their purity.

WALKER LAKE BASIN

Walker Lake, which next to Pyramid Lake is the most picturesque and attractive of the desert lakes of Nevada, lies in the northern part of Esmeralda County. It is supplied entirely by the Walker River, which enters at its north end.

As one of the lakes of the region occupied by glacial Lake Lahontan, it was described by Russell [5] as follows:

> The lake is 25.6 miles in its longer, or north and south axis and has an average width of between 4.5 and 5 miles. Its area is 95 square miles. * * * Over a

[5] Russell, I. C., Geological history of Lake Lahontan, a Quaternary lake of northwestern Nevada: U. S. Geol. Survey Mon. 11, pp. 69–70, 1885.

large area in the central and western portions it has a remarkably uniform depth of 224 feet; but as a rule the depth increases as one approaches the western shore, which is overshadowed by rugged mountains. The bottom throughout the central portions is composed of fine tenacious mud, which in many places is black in color and has the odor of hydrogen sulphide. Coarser deposits, consisting of sand and gravel, mingled with the empty shells of *Pyrgula* and *Pompholyx*, etc., were found only in the immediate neighborhood of the shore. * * *

As in the case of the other lakes in the Great Basin situated at an elevation of less than 5,000 feet, the shores of Walker Lake are totally lacking in arboreal vegetation except at the river mouth and are clothed only with desert shrubs. At the northern end and following the immediate shores of Walker River for many miles are luxuriant cottonwood groves, together with willow banks and meadow lands. * * *

The waters at a distance from the river mouth are of a clear deep blue, changing to a bright-green tint near the shore, as in Pyramid Lake. They are charged with saline matter to such an extent that carbonate of lime is now being deposited.

The Walker River, the inflowing stream, rises on the eastern slope of the Sierra Nevada in two main branches whose basins are separated by the Sweetwater Range. The East Fork of the Walker River receives the drainage from the eastern slope of the Sweetwater Range and the western slope of the Walker River Range; the West Fork flows at the base of the main range of the Sierra Nevada. From the union of the forks near Mason the river flows sluggishly northward, passing through the fertile Yerington Valley (Mason Valley) to a point east of Wabuska, where it turns east and then southeast, and 50 miles beyond the forks enters Walker Lake. The length of the river from Walker Lake to the junction of Virginia and Green Creeks, which form the East Fork, is about 120 miles, in which distance its fall is about 2,400 feet. In the 50 miles below the junction of the East and West Forks the fall is about 400 feet.

The basin contains but three large valleys—Antelope Valley on the West Fork; Smith Valley, a fertile table-land presenting ample opportunity for reclamation, also on the West Fork; and Mason Valley, which takes its water from the two forks. Only recently have the water rights in Mason Valley been adjusted. The minimum flow is not sufficient to supply the demand during the summer, although excellent reservoir sites near the headwaters of the forks are available for storing the flood waters for use during the dry season. The snowfall is very heavy, giving assurance of an ample water supply for reservoirs.

A line of levels run by the Bureau of Reclamation from a point above Yerington to the Carson River near the Towle ranch shows that water can be easily diverted by gravitation from the Walker River to the Carson River. The opportunities for the production of power afforded by both forks are as yet undeveloped because of the small demand for power near the rivers. Power development from the main stream is not feasible.

CARSON SINK BASIN

Carson Sink lies in Churchill County, Nev., in the northern part of the Carson Desert. During the winter and spring it receives a considerable supply of water from the Humboldt and Carson Rivers and becomes a shallow, playa lake from 20 to 25 miles long and 14 miles broad. In arid summers the water supply fails and the lake evaporates to dryness, and as desiccation becomes more intense the salts impregnating the lake beds are brought to the surface and form an efflorescence several inches thick. In October, 1881, the sink was a broad mud-colored plain, covered in places with a white alkaline crust that looked like patches of snow. In 1908 Carson Sink was mapped by the topographers of the United States Geological Survey as a permanent water body, 12 miles long by 12 miles broad, receiving the Carson River on the south. The drainage line from Humboldt Lake to the sink was marked as an intermittent river.

The Carson River is formed by its East [6] and West Forks, which rise in the extreme eastern part of California and flow northeastward to their union near the town of Gardnerville, Nev. From this point the river flows northward to Empire, Nev., where it turns to the east and finally disappears into Carson Sink. It is about 160 miles long to the head of the East Fork, and its total fall is about 6,400 feet. The fall of the East Fork above the junction is 5,500 feet, and the fall of the main stream in the 108 miles below the junction is about 900 feet. Between Empire and Dayton the river occupies a deep, rugged canyon.

The principal tributaries of the East Carson are Silver King, Wolf, Silver, Markleeville, and Leviathan Creeks. These streams drain a rough, mountainous country, ranging in altitude from 5,000 to 11,000 feet. Good storage sites exist on all the large tributaries. Part of the reservoir sites in Pleasant Valley and on Silver Creek have been developed.

The area drained by the West Carson is not so large as that of the East Carson and its altitudes are in general lower. By constructing a reservoir at Hope Valley a large amount of power may be developed in the West Carson Canyon.

The soil throughout the Carson and Dayton Valleys is very porous, and its irrigation requires a large amount of water. The low-water flow is sufficient to reclaim only a small part of the land. The irrigated acreage may, however, be greatly increased by constructing reservoirs on the headwaters to store the spring floods.

TRUCKEE RIVER BASIN

The Truckee River system comprises the main river and several minor tributaries, all having as their chief sources of supply small mountain lakes. The Truckee River itself is the natural outlet of

[6] Called East Carson River above mouth of Markleeville Creek.

Lake Tahoe, a beautiful mountain lake, 193 square miles in area, lying more than 6,000 feet above sea level, and noted as the largest body of fresh water in the United States at so high an altitude. Nearly three-fourths of the lake is in California, and the rest is in Nevada.

Issuing from the northwest side of Lake Tahoe the Truckee flows almost due north to the town of Truckee, Calif., where it turns east. At Wadsworth, Nev., the river again turns north and discharges into Pyramid and Winnemucca Lakes. From Lake Tahoe to Verdi, Nev., a distance of 35 miles, the country is heavily timbered with fir and pine; below Verdi barren wastes alternate with small and fertile valleys—the Verdi Valley, the Reno or Truckee Valley, and the Wadsworth Valley—all of which have a rich, productive soil. The total length of the Truckee is about 110 miles, and its total fall is about 2,350 feet.

Donner Creek, the natural outlet of Donner Lake, is the first large tributary of the Truckee, which it enters at the town of Truckee. Prosser Creek, the second tributary and the natural outlet of several small lakes, enters about 5 miles northeast of Truckee, and the Little Truckee River, the natural outlet of Webber and Independence Lakes, comes in at Boca, Calif., about 2 miles farther along. Each of these tributaries rises at an altitude of 6,000 feet, and each flows from a lake whose capacity can be enlarged by building a dam across its outlet. The region about the lakes is thickly forested and receives very heavy snowfall during the winter. During the season of thaw this snow affords an immense run-off, almost all of which could be stored by enlarging the natural lakes.

Three power plants have been installed on the Truckee—the Farad (Mystic), Fleish, and Washoe plants—with an emergency plant near Reno, Nev. The plants have an average capacity of about 2,500 horsepower each and they supply practically all the power used by the towns of Verdi, Reno, Carson City, Yerington, Gardnerville, Sparks, and Virginia City, Nev. There are many falls on the headwaters of the small tributaries.

Only data pertaining to that part of the stream which lies in California are published in this paper.

PYRAMID AND WINNEMUCCA LAKE BASINS [7]

Pyramid and Winnemucca Lakes occupy two long, narrow basins in Washoe and Humboldt Counties, Nev., and receive the waters of the Truckee River, which sends a stream to each lake. The first published account of the bifurcation of the Truckee River so as to supply two lakes is given by King,[8] who says:

> At the time of our first visit to this region, in 1867, the river bifurcated; one half flowed into Pyramid Lake, and the other through a river 4 or 5 miles long into

[7] Abstracted from Russell, I. C., Geological history of Lake Lahontan: U. S. Geol. Survey Mon. 11, pp. 56–66, 1885.

[8] U. S. Geol. Expl. 40th Par. Rept., vol. 1, pp. 505–506, 1878.

Winnemucca Lake. At that time the level of Pyramid Lake was 3,890 feet above the sea and of Winnemucca about 80 feet lower. Later, owing to the disturbance of the balance between influx and evaporation already alluded to as expressing itself in Utah by the rise and expansion of Great Salt Lake, the basin of Pyramid Lake was filled up and a backwater overflowed the former region of bifurcation, so that now the surplus waters go down the channel into Winnemucca Lake, and that basin is rapidly filling.

Between 1867, the time of my first visit, and 1871, the time of my last visit, the area of Winnemucca Lake had nearly doubled, and it has risen from its old altitude about 22 feet, Pyramid Lake in the same time having been raised about 9 feet. The outlines as given upon our topographical maps are according to the survey of 1867 and form interesting data for future comparison.

The differences in altitude between Pyramid and Winnemucca Lakes as reported by King and determined by Russell in 1882 are as follows: In 1867 Pyramid was 80 feet higher than Winnemucca; in 1872 Pyramid was 67 feet higher than Winnemucca; in 1882 Pyramid was 12 feet higher than Winnemucca, as determined by engineer's level. In 1890, when the region was surveyed by the topographers of the United States Geological Survey, Pyramid was but 5 feet higher than Winnemucca. The waters of both lakes are alkaline and brackish. Their shores, like those of all the lakes in the lower part of the Great Basin, are clothed only with scanty growths of desert vegetation.

In the southern part of Pyramid Lake the water is slightly discolored by multitudes of shining particles that are rendered visible when a ray of light is passed through it. The lack of transparency is apparently due to the suspended silt brought down by the Truckee River. In the northern part of the lake the water is wonderfully clear and at some distance from the land is deep blue.

The largest islands in Pyramid Lake are Pyramid and Anaho, which rise in its southern part near the eastern shore. Anaho Island rises 520 feet above the water level of 1890 and is surrounded by water 150 to 300 feet deep. Pyramid Island rises 320 feet above the water level of 1890, and the water near its base is 150 to 175 feet deep.

HONEY LAKE BASIN[9]

Honey Lake occupies a shallow depression in the eastern part of Lassen County, Calif. It is supplied principally from the Susan River, which enters it from the northwest, but during the rainy season it receives some water from Long Valley and from springs along its north side. The lake varies in area with the seasons, as well as from year to year, and in times of unusual aridity it becomes completely dry. Its shores are, as a rule, low and marshy and in places form broad tule swamps. Its water is strongly alkaline, unfit for human use, and always of a greenish-yellow color from the impalpable mud it holds in suspension.

[9] Abstracted from Russell, I. C., Geological history of Lake Lahontan: U. S. Geol. Survey Mon. 11, pp. 55–56, 1885.

A considerable area of land is irrigated by water from the Susan River, and several projects for irrigating other extensive areas by storage of its waters both above and below the town of Susanville have been under consideration.

The principal tributary of the Susan River, Willow Creek, flows from springs which are presumably fed by seepage from Eagle Lake, which has no surface outlet. It flows southward and joins the Susan River about 12 miles below Susanville. Its only large tributary is Petes Creek, which drains a considerable area in the eastern part of the basin. The drainage area of the main stream has a good timber covering, but that tributary to Petes Creek is barren of timber. The entire basin is composed of lava rock with a light covering of soil and contains large stretches of barren table-lands with scattered peaks of volcanic origin. There is a large area of cultivated land along Willow Creek above the gaging station at Standish, and considerable water is diverted for irrigating lands adjoining the stream.

STREAM FLOW

GAGING STATIONS

The following list comprises the gaging stations that have been maintained in California in the minor San Francisco Bay, northern Pacific, and Great Basins. The stations are arranged in downstream order, and tributaries are indicated by indention. A dash after the last date in a line indicates that the station was being maintained September 30, 1927.

MINOR SAN FRANCISCO BAY BASINS

COYOTE RIVER BASIN

Coyote River near Madrone, Calif., 1902–1912; 1917–
Coyote River at Coyote, Calif., 1916–1923.
Coyote River near Edenvale, Calif., 1916–
Coyote River at San Jose, Calif., 1917.
Laguna Seca near Coyote, Calif., 1918.

ALAMEDA CREEK BASIN

Alameda Creek near Sunol, Calif., 1911–
Alameda Creek at Sunol, Calif., 1900–
Alameda Creek at Niles Dam, Calif., 1891–1900.
Alameda Creek near Niles, Calif., 1916–
Alameda Creek near Decoto, Calif., 1916–1919.
Calaveras Creek near Sunol, Calif., 1910–
San Antonio Creek near Sunol, Calif., 1912–
Arroyo de la Laguna near Pleasanton, Calif., 1912–
Alamo Creek at Dublin, Calif., 1914–1920.
Tassajero Creek near Pleasanton, Calif., 1914–
Arroyo Mocho near Livermore, Calif., 1912–
Arroyo las Positas near Livermore, Calif., 1912–
Arroyo del Valle near Livermore, Calif., 1912–

Alameda Creek—Continued.
Spring Valley Water Co.'s aqueduct near Sunol, Calif., 1903–
Laguna Creek at Irvington, Calif., 1916–1919.
Dry Creek near Decoto, Calif., 1916–1919.

SAN PABLO CREEK BASIN

San Pablo Creek near San Pablo, Calif., 1917–1919.
San Pablo Creek at San Pablo, Calif., 1917–1919

NORTHERN PACIFIC BASINS

RUSSIAN RIVER BASIN

Russian River near Ukiah, Calif., 1911–1913.
Russian River at Geyserville, Calif., 1911–1913.
East Fork of Russian River near Ukiah, Calif., 1911–1913.

MATTOLE RIVER BASIN

Mattole River near Petrolia, Calif., 1911–1913.

EEL RIVER BASIN

South Eel River at Hullville, Calif., 1922–
South Eel River and Snow Mountain Water & Power Co.'s tailrace near Potter Valley, Calif., 1909–
South Eel River at Hearst, Calif., 1911–1913.
Eel River at Two Rivers, Calif., 1911–1913.
Eel River at Scotia, Calif., 1911–
Snow Mountain Water & Power Co.'s tailrace near Potter Valley, Calif., 1922–
Middle Fork of Eel River near Covelo, Calif., 1911–1921.
South Fork of Eel River at Garberville, Calif., 1911–1913.
Van Duzen River at Bridgeville, Calif., 1911–1913.
Yager Creek at Carlotta, Calif., 1911–1913.

MAD RIVER BASIN

Mad River near Arcata, Calif., 1911–1913.

REDWOOD CREEK BASIN

Redwood Creek near Korbel, Calif., 1911–1913.
Redwood Creek at Orick, Calif., 1911–1913.

KLAMATH RIVER BASIN

Klamath River near Copco, Calif., 1923–
Klamath River near Seiad Valley, Calif., 1912–1925.
Klamath River near Happy Camp, Calif., 1911–12.
Klamath River near Requa, Calif., 1911–1926.
Antelope Creek near Macdoel, Calif., 1921–22.
Butte Creek near Macdoel, Calif., 1921–22.
Bear Creek near Macdoel, Calif., 1921–22.
Shasta River near Montague, Calif., 1911–
East Fork of Scott River near Callahan, Calif., 1910–11.
Scott River near Scott Bar, Calif., 1911–1913.
Indian Creek near Happy Camp, Calif., 1911–12.
Reeve Davis flume near Happy Camp, Calif., 1911–12.
Salmon River at Somesbar, Calif., 1911–1913.
Trinity River near Trinity Center, Calif., 1911–12.

Klamath River—Continued.
Trinity River at Lewiston, Calif., 1911–
Trinity River near China Flat, Calif., 1911–1913.
Trinity River at Hoopa, Calif., 1911–1914; 1916–1918.
Coffee Creek at Coffee, Calif., 1911–1914.
East Fork of Trinity River near Trinity Center, Calif., 1911.
Swift Creek near Trinity Center, Calif., 1911.
North Fork of Trinity River at Helena, Calif., 1911–1913.
South Fork of Trinity River near China Flat, Calif., 1911–1913.

SMITH RIVER BASIN

Middle Fork of Smith River near Crescent City, Calif., 1911–1913; 1915–16.
North Fork of Smith River near Crescent City, Calif., 1911–1913.
South Fork of Smith River near Crescent City, Calif., 1911–1913.

GREAT BASIN

SALTON SINK BASIN

Alamo River near Brawley, Calif., 1909–1911.

WHITEWATER RIVER BASIN

Snow Creek near Whitewater, Calif., 1921–
Southern Pacific Co.'s ditch near Whitewater, Calif., 1921–
Falls Creek near Whitewater, Calif., 1922–

OWENS LAKE BASIN

Owens River near Round Valley, Calif., 1903–1923.
Owens River at Pleasant Valley, near Bishop, Calif., 1925–
Owens River near Big Pine, Calif., 1906–
Owens River near Lone Pine, Calif., 1909–1918.
Owens River near Citrus, Calif., 1904–5.
Rock Creek at Sherwin Hill, near Bishop, Calif., 1925–
Rock Creek near Round Valley, Calif., 1903–1924.
Pine Creek at division box near Bishop, Calif., 1925–
Pine Creek near Round Valley, Calif., 1903–1924.
Bishop Creek near Bishop, Calif., 1903–1911.
Baker Creek near Big Pine, Calif., 1907.
Big Pine Creek near Big Pine, Calif., 1904–1911.
Tinemaha Creek near Big Pine, Calif., 1907–1911.
Birch Creek near Big Pine, Calif., 1907–1911.
Taboose Creek near Aberdeen, Calif., 1906–1911.
Goodale Creek near Aberdeen, Calif., 1906–1911.
Division Creek near Independence, Calif., 1906–1910.
Sawmill Creek near Independence, Calif., 1906–1909.
Oak Creek near Independence, Calif., 1906–1911.
Little Pine Creek near Independence, Calif., 1905–1911.
Shepard Creek near Thebe, Calif., 1906–1909.
Bairs Creek near Thebe, Calif., 1906–1909.
George Creek near Thebe, Calif., 1906–1909.
Lone Pine Creek near Lone Pine, Calif., 1906–1911.
Tuttle Creek near Lone Pine, Calif., 1906–1911.
Cottonwood Creek near Olancha, Calif., 1906–1911.
Ash Creek near Olancha, Calif., 1906–1909.

ANTELOPE VALLEY BASIN

Little Rock Creek near Palmdale, Calif., 1896–1899.
Rock Creek near Valyermo, Calif., 1923–

MOHAVE RIVER BASIN

Mohave River at Victorville, Calif., 1899–1905.

MONO LAKE BASIN

Rush Creek near Mono Lake, Calif., 1910–1912.
Leevining Creek near Mono Lake, Calif., 1910–1913.

WALKER LAKE BASIN

East Walker River near Bridgeport, Calif., 1921–
  Robinson Creek near Bridgeport, Calif., 1910–1912.
  Buckeye Creek near Bridgeport, Calif., 1910–1912.
    Swager Creek near Bridgeport, Calif., 1911–1912.
West Walker River near Coleville, Calif., 1902–1910; 1915–
  East Fork of West Walker River near Bridgeport, Calif., 1910.

CARSON SINK

East Fork of Carson River near Markleeville, Calif., 1910–
East Fork of Carson River at California-Nevada State line, 1911–1914.
  Silver Creek near Markleeville, Calif., 1910–1912.
  Markleeville Creek near Markleeville, Calif., 1911–
  Markleeville Creek at Markleeville, Calif., 1910–
    Pleasant Valley Creek at Markleeville, Calif., 1910–11.
  West Fork of Carson River at Woodfords, Calif., 1900–1920.

PYRAMID AND WINNEMUCCA LAKES BASINS

Truckee River at Tahoe, Calif., 1895–
Truckee River at Boca, Calif., 1890.
Truckee River at Iceland, Calif., 1912–
Truckee River at Nevada-California State line, 1899–1912.
  Donner Creek at Donner Lake, near Truckee, Calif., 1909–10.
  Donner Creek near Truckee, Calif., 1902–1915.
  Prosser Creek near Truckee, Calif., 1903–1912.
  Prosser Creek at Boca, Calif., 1889–90.
    South Fork of Prosser Creek near Truckee, Calif., 1909–10.
  Little Truckee River near Truckee, Calif., 1909–10.
  Little Truckee River at Starr, Calif., 1903–1910.
  Little Truckee River at Boca, Calif., 1890; 1911–1915.
    Webber Creek near Truckee, Calif., 1909–10.
    Independence Creek below Independence Lake, Calif., 1902–1910.

HONEY LAKE BASIN

Long Valley Creek near Scotts, Calif., 1917.
Baxter Creek near Lassen, Calif., 1913–1915; 1918–19.
  Schloss Creek at Lassen, Calif., 1915; 1918–19.
  Janesville Creek at Lassen, Calif., 1915; 1918–19.
Susan River near Susanville, Calif., 1900–1905; 1917–1921.
  Gold Run Creek near Susanville, Calif., 1915–16.
  Lassen Creek near Susanville, Calif., 1915.
  Willow Creek at Merrillville, Calif., 1904–5.
  Willow Creek near Standish, Calif., 1905.

SURPRISE VALLEY BASIN

Bidwell Creek near Fort Bidwell, Calif., 1911–12; 1918.
Bidwell Creek at Fort Bidwell, Calif., 1918–19.
Keeno Creek near Fort Bidwell, Calif., 1918–19.
Twelvemile Creek near Fort Bidwell, Calif., 1918–19; 1922.
East Fork of Horse Creek near Fort Bidwell, Calif., 1918–19.
West Fork of Horse Creek near Fort Bidwell, Calif., 1917–1919.
Rock Creek near Fort Bidwell, Calif., 1918–19.

MAXIMUM AND MINIMUM DISCHARGES

Maximum and minimum discharges recorded at stations in the minor San Francisco Bay, northern Pacific, and Great Basins, Calif.

Minor San Francisco Bay Basins

Station	Period of record	Drainage area	Maximum discharge				Minimum discharge
			Date	Gage height	Discharge	Discharge per square mile	
		Sq. mi.		*Feet*	*Sec.-ft.*	*Sec.-ft.*	*Sec.-ft.*
Alameda Creek near Niles	1916–1927	633	Feb. 10, 1922	12.44	13,900	22.0	0
Coyote River near Madrone	1902–1912, 1917–1927	193	Mar. 11, 1911		25,000	130	0
Coyote River near Edenvale	1916–1927		Feb. 11, 1922	12.8	10,000		0

Northern Pacific Basins

Eel River at Scotia	1911–1927		Feb. 2, 1915	55.5	290,000		10
Klamath River near Requa	1911–1926		do	33.3	182,000		1,340
Shasta River near Montague	1911–1927		Feb. 11, 1925	14.9	5,700		1.0
Trinity River at Lewiston	1911–1927		Nov. 30, 1926	18.3	31,900		23

Great Basin

West Fork of Carson River at Woodfords.	1900–1920	70	May 9, 10, 1906.	6.8	1,570	22.4	0
Owens River near Big Pine	1906–1927		Jan. 26, 1914	11.2	3,220		36
Owens River near Lone Pine	1909–1918		July 7, 1909	10.6	2,050		4
Owens River near Round Valley	1903–1923	450	June 30, 1907	4.0	1,190	2.64	5.4
Pine Creek near Round Valley	1903–1923	32	June 22, 1911		370	11.6	.1
Rock Creek near Round Valley	1903–1923	46	Jan. 25, 1914	5.0	360	7.83	14
Susan River at Susanville	1900–1905, 1913, 1916–1921		Feb. 22, 1904	9.9	1,750		.8
Truckee River at Iceland	1907–1927	937	Mar. 18, 1907		[a] 15,300	16.3	[a] 40
Truckee River at Tahoe	1895–96, 1900–1924	519	July 13–20, 1907.		[a] 1,340	2.58	0
West Walker River near Coleville	1915–1927	245	June 12, 1921	5.74	2,710	11.1	14

[a] Mean daily discharge.

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MONTHLY-DISCHARGE RECORDS

Monthly discharge, in second-feet, at stations in minor San Francisco Bay basins, Calif.

Coyote River near Madrone

[Drainage area, 193 square miles]

Year	October	November	December	January	February	March	April	May	June	July	August	September	Mean
1902–3	0.75	1.93	2.61	290	153	490	400	20.4	11.4	7.42	4.92	0.66	115
1903–4	.60	1.20	1.29	2.12	105	384	67.8	17.7	6.16	2.47	.81	2.78	49.3
1904–5	2.73	3.20	1.09	9.77	165	252	35.5	48.0	10.8	4.18	1.82	.61	44.6
1905–6	.43	.92	1.49	539	235	778	235	73.1	38.5	14.4	6.68	4.48	161
1906–7	3.18	6.92	372	932	326	1,380	217	61.9	29.5	13.2	8.32	4.97	280
1907–8	4.3	14.4	120	195	234	156	27.4	14.7	8.82	4.7	2.33	1.90	65.3
1908–9	1.82	2.19	3.07	1,100	1,260	346	173	48.9	28.6	15.6	11.2	9.9	250
1909–10	10.7	12.0	105	355	129	139	59.7	17.6	7.7	4.6	3.3	3.1	70.6
1910–11	3.4	3.6	4.6	524	292	1,190	45.1	7.0	3.9	2.5	1.8	1.5	173
1911–12	1.6	1.8	1.8	2.9	3.2	59.4	23.4	3.6	2.8	1.9	1.4	1.2	8.75
1916–17				112	773	114	41.4	17.5	7.14	2.63	1.61	1.19	
1917–18	.39	.74	1.45	1.95	11.7	168	9.94	3.47	1.90	.38	.1		
1918–19				8.31	455	256	30.4	15	10	4.60	1.49	.51	
1919–20	.39	1.02	18.1	5.12	3.95	122	62.2	11.8	4.34	.83	.02	0	19.3
1920–21	0	.5	118	543	117	120	18.6	10.3	5.00	2.0	1.0	.5	78.4
1921–22	.50	.62	115	58.4	781	142	67.6	20.0	10.1	3.91	1.48	.86	95.5
1922–23	1.15	3.65	224	331	117	30.1	99.8	16.9	8.00	3.79	1.71	1.04	69.9
1923–24	.98	.94	1.23	1.83	1.50	1.72	3.31	1.75	.87	.18	0	.21	1.21
1924–25	.40	2.86	3.25	10.7	142	16.5	37.2	9.68	4.50	1.69	.44	.16	18.2
1925–26	.11	.30	.77	1.24	512	18.7	158	12.9	4.05	1.37	.63	.39	55.7
1926–27	.52	21.2	8.24	25.9	652	89.5	108	17.3	7.36	3.04	1.50	.61	73.7
Average	1.79	4.21	58.1	240	308	298	91.4	21.4	10.1	4.54	2.50	1.83	90.5

Coyote River at Coyote

1916–17	0	0	56.6	73.4	716	82.4	5.87	0.048	0	0	0	0	73.5
1917–18	0	0	0	0	0	67.3	0	0	0	0	0	0	5.71
1918–19	0	0	0	0	329	149	.07	0	0	0	0	0	37.9
1919–20	0	0	.32	0	0	51.2	14	0	0	0	0	0	5.52
1920–21	0	0	61.4	318	77.0	30.4	1.27	0	0	0	0	0	40.8
1921–22	0	0	113	18.2	752	126	26.0	.67	0	0	0	0	81.7
1922–23	0	0	200	265	82.5	3.2	70.6	1.11	0	0	0	0	52.0

Monthly discharge, in second-feet, at stations in minor San Francisco Bay basins, Calif.—Continued

Coyote River near Edenvale

Year	October	November	December	January	February	March	April	May	June	July	August	September	Mean
1916–17	0	0	41.2	60.9	698	84.8	13.6	3.15	1.30	0	0	0	70.9
1917–18	0	0	0	0	0	42.6	0	0	0	0	0	0	3.62
1918–19	0	0	0	0	266	162	.06	0	0	0	0	0	34.2
1919–20	0	0	0	0	0	33.5	8.57	0	0	0	0	0	3.54
1920–21	0	0	23.2	325	51.1	8.80	0	0	0	0	0	0	34.2
1921–22	0	0	75.5	15.9	748	130	30.2	0	0	0	0	0	78.6
1922–23	0	0	156	284	85.9	3.3	58.5	0	0	0	0	0	49.1
1923–24	0	0	0	0	0	0	0	0	0	0	0	0	0
1924–25	0	0	0	0	79.6	0	0	0	0	0	0	0	6.10
1925–26	0	0	0	0	301	0	99.8	0	0	0	0	0	31.3
1926–27	0	1.57	0	0	471	46.5	64.3	0	0	0	0	0	45.5
Average	0	.14	26.9	62.3	246	46.5	25.0	.29	.12	0	0	0	32.5

Coyote River at San Jose

1916–17				72.4	672	82.4	10.8	1.84	0.383	0	0	0	

Laguna Seca near Coyote

1917–18					0.075	0.326	1.23	1.06	0.376	0	0	0	

Alameda Creek near Sunol

[Drainage area, 33.1 square miles]

1910–11									3.47	2.86	2.57	0.61	
1911–12	0.29	0.42	0.70	17.3	4.17	37.5	7.90	4.24	2.94	2.10	1.27	.48	6.67
1912–13	.35	.36	.43	40.2	3.76	7.82	4.93	1.95	1.43	.37	.20	.12	5.21
1913–14	0	.13	56.0	204	108	11.3	4.42	2.50	1.55	0	0	0	32.1
1914–15	0	0	8.31	90.9	248	32.7	17.8	72.5	8.72	2.52	1.02	.93	39.0
1915–16	.77	.73	11.7	307	124	37.9	9.25	3.54	1.27	.96	.36	.20	41.4
1916–17	0	0	40.2	31.8	168	35.5	11.3	6.85	3.82	0	0	0	23.8

1917–18	0	0	0	0	11.4	42.3	4.97	1.41	.68	0	0	4.10	5.39
1918–19	.22	5.32	5.70	6.00	173	103	11.1	3.40	1.08	0	0	0	24.8
1919–20	0	0	4.14	.83	.80	47.6	34.8	1.97	.16	0	0	0	7.55
1920–21	0	3.79	62.7	88.7	52.3	13.0	5.76	3.59	1.10	0	0	0	19.2
1921–22	0	0	37.6	23.0	214	9.9	32.5	8.72	2.09	0	0	0	32.8
1922–23	0	4.06	93.4	49.4	46.3	8.73	28.2	3.87	0	0	0	0	19.4
1923–24	0	0	0	0	0	.04	.19	0	0	0	0	0	.02
1924–25	0	0	7.85	7.42	76.4	4.73	10.6	10.6	0	0	0	0	9.33
1925–26	0	0	0	7.68	151	10.3	39.6	2.68	.007	0	0	0	16.6
1926–27	0	31.7	10.2	26.6	140	34.5	44.9	5.24	.07				
Average	.10	2.91	21.2	56.3	95.1	32.3	16.8	8.32	1.67	.55	.34	.40	18.9

Alameda Creek at Sunol

[Drainage area, 620 square miles]

1900–1901	10.9	391	52.1	282	993	161	66.0	57.8	23.1	9.31	2.57	0	
1901–2	0	.52	17.4	7.11	521	685	127	39.3	14.7	5.03	2.29	0	116
1902–3	0	5.42	.730	267	329	677	519	38.9	3.36	.958	0	0	152
1903–4	0	23.8	.32	5.83	420	812	273	90.1	9.00	1.22	.229	.031	135
1904–5	.01	.02	.103	52.8	166	350	102	79.5	7.88	.106	.039	0	62.8
1905–6	.003	.016	.099	898	397	1,400	462	130	57.7	9.18	1.63	.87	281
1906–7	.03	.03	321	1,140	518	2,780	381	106	41.0	29.3	11.5	1.86	447
1907–8	2.07	7.46	74.2	229	241	175	27.2	12.9	.78	.65	.35	.75	63.9
1908–9	.20	.44	1.27	1,780	1,830	352	80.9	13.1	5.40	4.68	.020	.229	330
1909–10	1.61	1.44	155	552	259	276	112	29.4	5.78	3.67	1.32	.72	116
1910–11	.290	.29	1.09	1,540	756	2,050	103	29.8	5.65	4.40	3.73	2.26	375
1911–12	1.83	2.72	3.47	67.7	27.5	134	28.6	5.03	.239	.001	0	0	22.7
1912–13	0	0	0	89.6	2.15	14.6	.329	0	0	0	0	0	9.04
1913–14	0	0	175	1,720	926	131	38.5	2.98	1.08	.17	.003	0	247
1914–15	0	0	15.8	404	1,960	254	126	355	31.7	3.77	.11	0	251
1915–16	0	0	64.4	2,440	938	291	55.7	24.0	17.9	11.4	7.4	2.2	321
1916–17	5.34	.39	45.3	89.9	979	157	28.9	17.8	15.5	30.4	32.8	49.7	115
1917–18	68.1	5.41	.52	0	7.66	82.9	1.09	0	0	16.8	23.5	43.1	21.0
1918–19	37.9	3.51	29.6	13.6	795	660	40.1	11.6	14.2	27.8	22.0	28.9	136
1919–20	1.89	0	.18	0	0	58.6	29.7	14.4	20.5	5.42	0	0	10.9
1920–21	0	0	195	513	208	16.0	13.2	7.02	.70	0	0	.66	79.2
1921–22	.10	0	175	86.0	1,290	281	65.8	13.5	18.7	2.62	0	0	154
1922–23	.80	9.70	336	257	195	36.8	39.4	18.4	46.6	56.8	41.7	23.9	88.3
1923–24	14.2	9.88	5.27	.79	.32	0	0	0	0	0	0	0	2.55
1924–25	0	0	0	0	236	3.60	23.3	12.8	30.3	15.4	0	0	25.2
1925–26	0	0	0	2.84	370	.28	92.5	.46	.46	.46	.39	.20	36.4
1926–27	0	31.6	3.17	8.57	470	43.1	61.0	23.6	23.2				
Average	5.38	18.3	61.9	461	549	440	107	42.0	14.6	9.21	5.83	5.98	144

Monthly discharge, in second-feet, at stations in minor San Francisco Bay basins, Calif.—Continued

Alameda Creek at Niles Dam

Year	October	November	December	January	February	March	April	May	June	July	August	September	Mean
1890–91				57.0	705	717	147	57.5	34.4	14.3	1.40	0	
1891–92	0	0	157	79.6	83.6	273	185	110	27.2	7.59	0	0	77.1
1892–93	0	741	1,980	675	1,220	916	281	121	31.1	20.2	13.6	11.1	497
1893–94	5.59	10.7	25.4	807	1,340	214	53.2	32.4	22.3	13.0	3.93	1.30	204
1894–95	9.37	7.90	874	2,330	703	174	113	89.5	32.8	15.5	4.19	4.69	364
1895–96	10.1	12.6	15.2	963	117	119	516	137	31.9	10.7	3.93	4.24	162
1896–97	5.11	76.3	122	132	1,410	1,360	243	67.6	29.1	15.9	6.46	3.61	282
1897–98	5.05	2.71	5.40	13.2	45.7	32.9	10.2	3.25	.45	0	.15	0	9.69
1898–99	1.04	.94	.28	24.0	3.79	939	55.3	13.7	5.27	1.63	.04	0	88.5
1899–1900	2.26	28.1	108	494	36.2	113	37.2	21.0	3.98	.93	.06	1.34	71.3
Average	4.28	97.8	365	557	566	486	164	65.3	21.8	10.0	3.38	2.63	195

Alameda Creek near Niles

[Drainage area, 633 square miles]

1916–17	6.05	3.13	48.9	92.8	1,050	150	23.6	12.1	11.9	34.4	28.5	42.5	119
1917–18	57	3.35	.50	.21	6.33	86.0	.43	.12	.04	6.31	18.8	27.6	17.4
1918–19	38.4	5.75	19.0	13.1	881	701	46.7	10.5	16.2	30.7	27.8	34.8	147
1919–20	2.50	.43	.93	.60	.50	54.1	29.0	11.5	25.5				
1920–21	.5	.5	250	640	245	24.5	20.0	16.9	2.31	.44	.29	1.43	99.9
1921–22	1.87	1.84	247	95.4	1,500	305	80.1	22.6	24.7	4.21	1.00	1.06	181
1922–23	1.83	8.53	323	261	191	38.9	42.6	13.1	18.9	25.6	16.4	24.4	80.2
1923–24	21.6	5.22	1.82	2.41	1.54	.64	.42	.10	0	0	0	0	2.84
1924–25	0	.08	1.04	1.59	231	7.57	27.0	17.4	28.7	14.6	0	0	25.9
1925–26	0	0	.08	1.43	418	2.51	99.7	24.9	1.52	.14	0	0	42.8
1926–27	.23	36.8	4.98	17.0	545	56.2	79.7	38.0	39.4	26.0	.10	0	66.7
Average	11.8	5.97	81.6	102	461	130	40.8	15.2	15.4	14.2	9.29	13.2	78.3

Alameda Creek near Decoto

1916–17	0	0	38.4	78.2	1,010	135	9.92	0	0	4.42	5.32	21.3	102
1917–18	40.5	1.42	0	0	0	68.4	0	0	0	0	0	6.96	9.94
1918–19	18.6	0	.60	2.32	811	690	33.4	0	0	3.23	5.61	1.82	126

Calaveras Creek near Sunol

[Drainage area, 100 square miles]

1909–10										8.98	5.94	4.19	
1910–11	4.31	2.64	4.33	449	298	607	69.7	36.5	17.9	10.7	8.00	5.64	126
1911–12	5.06	6.58	8.08	37.7	14.0	121	36.7	12.8	4.60	2.76	1.36	1.00	21.1
1912–13	.84	1.09	2.45	108	8.42	14.7	8.83	4.18	2.91	1.92	1.19	.86	13.1
1913–14	.56	.57	153	744	347	26.6	15.5	9.97	5.00	0	0	0	108
1914–15	0	0	40.8	222	717	101	60.2	175	31.3	7.09	2.87	2.61	109
1915–16	2.17	2.06	28.4	778	239	21.4	4.75	11.3	11.7	16.0	20.0	17.9	96.1
1916–17	10.6	6.52	8.40	21.0	357	34.0	11.1	16.2	23.3	64.7	58.1	76.6	55.2
1917–18	86.7	5.87	2.47	1.36	2.49	3.94	15.7	1.46	0	37.0	40.5	38.2	19.8
1918–19	58.6	15.1	21.8	10.6	127	271	33.8	31.7	49.3	62.1	53.8	63.5	66.3
1919–20	11.4	1.05	17.3	4.23	6.86	7.71	10.0	38.1	53.4	26.7	12.0	12.6	16.8
1920–21	14.1	14.8	156	188	56.5	1.39	29.9	28.9	25.5	31.5	34.5	35.4	51.7
1921–22	30.7	18.5	167	52.6	373	80.4	23.3	20.7	47.0	24.8	29.7	32.9	73.1
1922–23	27.2	23.4	98.1	52.7	54.0	24.6	12.3	27.9	41.7	59.0	49.9	63.2	44.5
1923–24	45.5	32.4	19.6	18.6	17.9	14.3	15.2	18.3	17.7	15.3	14.3	7.12	19.7
1924–25	2.18	4.16	2.54	.23	.13	0	23.9	25.0	64.3	35.9	16.3	30.4	17.1
1925–26	36.4	31.0	32.6	23.5	1.74	20.3	9.40	58.9	59.7	65.9	65.2	64.1	39.3
1926–27	62.3	53.9	53.7	36.0	3.25	4.55	22.3	93.9	97.2				
Average	23.4	12.9	48.0	162	154	79.6	23.7	35.9	32.5	27.7	24.3	26.8	54.8

NOTE.—Construction of Calaveras Reservoir was begun in July, 1915.

San Antonio Creek near Sunol

[Drainage area, 38.7 square miles]

1911–12				5.54	2.24	9.19	2.82	1.60	0.47	0.13	0.006	0	
1912–13	0	0.16	0.80	15.6	2.25	3.85	4.08	2.17	.17	.15	0	0	2.45
1913–14	0	.11	27.0	151	70.3	21.2	11.3	5.91	2.53	0	0	0	24.0
1914–15	0	0	3.40	42.3	205	28.7	11.1	42.8	5.12	.92	.47	.40	27.2
1915–16	0.35	.34	13.9	258	98.3	46.0	8.17	3.89	2.01	.42	.18	.16	36.0
1916–17	.37	.37	12.0	12.0	60.9	22.9	5.43	2.48	.70	0	0	0	9.44
1917–18	0	.04	.19	.29	3.82	28.6	1.93	.61	0	0	0	2.84	3.21
1918–19	.15	3.71	1.47	4.34	106	74.4	9.36	4.63	.56	0	0	0	16.5
1919–20	0	0	.67	.95	2.89	29.7	13.5	1.46	0	0	0	0	4.11
1920–21	0	0	25.1	62.5	37.5	11.8	6.84	5.23	1.47	0	0	0	12.5
1921–22	0	0	19.6	16.2	128	46.2	14.9	3.00	.69	.03	0	0	18.3
1922–23	0	1.28	37.7	28.3	20.9	4.60	7.57	1.03	.05	0	0	0	8.42
1923–24	0	0	0	0	0	0	0	0	0	0	0	0	0
1924–25	0	0	2.32	1.99	42.3	5.11	7.92	2.17	.40	0	0	0	4.92
1925–26	0	0	0	.12	63.5	3.75	17.6	.43	0	0	0	0	6.69
1926–27	0	5.11	5.39	12.9	60.8	17.8	19.0	5.86	2.53				
Average	.06	.74	9.97	38.3	56.5	22.1	8.84	5.20	1.05	.11	.04	.02	12.4

Monthly discharge, in second-feet, at stations in minor San Francisco Bay basins, Calif.—Continued

Arroyo de la Laguna near Pleasanton

[Drainage area, 401 square miles]

Year	October	November	December	January	February	March	April	May	June	July	August	September	Mean
1911–12				11.5	6.47	7.72	6.48	5.25	3.39	1.33	0.56	0.61	
1912–13	0.44	1.02	0.84	2.23	.95	.87	.83	.61	.38	0	0	0	0.68
1913–14	0	0	105	1,350	625	72.1	11.5	8.15	3.73	0	0	0	179
1914–15	0	0	1.41	76.3	728	93.3	38.7	74.0	11.5	7.42	4.52	2.98	82.1
1915–16	1.89	1.01	6.45	1,190	443	154	41.9	19.0	14.0	13.2	8.68	7.03	158
1916–17	9.75	5.74	21.1	35.0	385	64.3	22.0	15.8	10.0	6.70	5.35	5.38	46.5
1917–18	3.93	2.11	1.26	1.31	1.58	15.1	1.25	.42	0	0	0	0	2.27
1918–19	0	0	0	13.9	403	207	13.7	8.17	5.26	0	0	0	51.9
1919–20	0	0	.99					0	0	0	0	0	
1920–21	0	0	7.63	162	54.0	8.35	4.95	3.02	1.58	1.03	.88	.42	20.3
1921–22	1.36	1.54	20.5	18.6	589	82.4	24.3	10.1	5.79	2.90	2.76	3.34	59.9
1922–23	4.35	3.74	99.7	107	59.8	11.6	16.6	8.31	6.59	3.91	1.48	1.75	27.0
1923–24	2.47	2.96	3.13	.98	.83	.52	.11	0	0	0	0	0	.92
1924–25	0	0	0	0	95.2	2.99	1.25	.21	0	0	0	0	7.68
1925–26	0	0	0	0	259	.67	59.8	.53	.16	0	0	0	24.9
1926–27	0	13.4	.72	.29	325	32.2	40.5	1.10	.70				
Average	1.61	2.10	17.9	198	265	50.2	18.9	9.67	3.94	2.43	1.62	1.43	50.9

Alamo Creek at Dublin

[Drainage area, 40.4 square miles]

1914–15	0	0	0.93	17.8	86.7	15.0	11.8	14.2	0.31	0	0	0	11.7
1915–16	0	0	8.79	159	41.3	13.5	4.03	.91	.25	0	0	0	19.1
1916–17	0	0	1.30	6.57	51.2	9.72	3.14	.96	.08	0	0	0	5.77
1917–18	0	0	0	0	0	1.47	0	0	0	0	0	0	.12
1918–19	0	0	0	2.24	79.7	30.7	2.93	.10	0	0	0	0	9.16
1919–20	0	0	0	0	0	.19	.03	0	0	0	0	0	.02

Tassajero Creek near Pleasanton

[Drainage area, 27.9 square miles]

1914–15			0.61	4.07	40.5	7.09	4.57	7.46	1.03	0	0	0	5.20
1915–16	0	0	1.25	88.0	38.3	12.5	5.66	2.15	1.21	1.95	0	0	12.6
1916–17	0	1.02	1.96	1.36	7.99	3.23	1.46	.46	.31	0	0	0	1.44
1917–18	0	0	.39	.55	.74	1.12	.28	0	0	0	0	0	.25
1918–19	0	0	0	.61	25.8	7.72	1.54	.55					
1921–22	0	0	.35	.55	29.0	2.81	1.05	0	0	0	0	0	2.63
1922–23	0	.73	6.08	7.48	2.35	.93	1.76	.44	0	0	0	0	1.65
1923–24	0	0	0	0	0	0	0	0	0	0	0	0	0
1924–25	0	0	.38	.27	13.8	.92	.46	0	0	0	0	0	1.23
1925–26	0	0	0	.13	2.03	.30	.71	0	0	0	0	0	.25
1926–27	0	.14	.14	.38	19.7	5.72	5.91	.19	0				
Average	0	.19	1.01	9.40	16.4	3.85	2.13	1.02	.26	.22	0	0	2.81

Arroyo Mocho near Livermore

[Drainage area, 38.3 square miles]

1911–12				1.82	0.54	3.32	0.54	0.38	0.08	0.01	0	0	
1912–13	0	0.07	0.24	2.71	.32	.53	.30	.05	0	0	0	0	0.35
1913–14	0	.06	2.55		64.9	3.46	.79	.53	.36	0	0	0	
1914–15	0	0	2.47	18.4	100	9.55	5.60	8.99	.52	.09	.07	.06	11.6
1915–16	0.06	.22	2.52	111	54.2	18.1	5.93	3.13	.70	.19	.06	.06	16.3
1916–17	.39	.39	3.09	3.80	39.3	3.69	.45	.15	.09	0	0	0	4.04
1917–18	0	0	.22	.24	1.41	5.99	.46	.19	0	0	0	0	.71
1918–19	0	0	0	.61	26.1	23.6	2.31	.46	.23	0	0	0	4.31
1919–20	0	0	.51	.77	.89	9.73	4.20	0	0	0	0	0	1.35
1920–21	0	0	2.32	16.3	6.28	2.00	.85	.08	0	0	0	0	2.30
1921–22	0	.09	5.80	4.95	61.1	8.80	2.53	.46	0	0	0	0	6.60
1922–23	0	.11	8.31	6.01	5.48	1.00	2.72	.12	0	0	0	0	1.96
1923–24	0	0	0	.09	.35	0	0	0	0	0	0	0	.04
1924–25	0	0	.28	1.00	4.72	.92	1.10	.50	0	0	0	0	.68
1925–26	0	0	0	.14	31.2	1.52	9.32	.73	.017	0	0	0	3.36
1926–27	0	4.45	1.57	2.19	27.2	7.84	7.67	2.47	1.29				
Average	.03	.36	1.99	11.3	26.5	6.25	2.80	1.14	.21	.02	.01	.01	4.12

Monthly discharge, in second-feet, at stations in minor San Francisco Bay basins, Calif.—Continued

Arroyo las Positas near Livermore

[Drainage area, 69.5 square miles]

Year	October	November	December	January	February	March	April	May	June	July	August	September	Mean
1911–12				2.33	1.32	1.65	0.76	0.35	0.18	0.13	0.09	0.10	
1912–13	0.08	0.11	0.15	.46	.39	.35	.19	.02	0	0	0	0	0.14
1913–14	0	0	.69	19.8	4.15	1.22	.76	.61	.45	0	0	0	2.31
1914–15	0	0	.40	5.89	35.5	8.13	4.33	7.87	.51	.38	.40	.39	5.11
1915–16	.37	.36	1.93	88.4	30.7	17.3	7.80	2.00	1.01	1.50	1.09	.94	12.8
1916–17	.94	.97	1.50	1.79	3.42	1.55	.77	.46	.15	0	0	0	.95
1917–18	0	0	.35	.40	.52	1.83	.31	.11	0	0	0	0	.29
1918–19	0	0	0	.60	10.3	9.74	.46	0	0	0	0	0	1.71
1919–20													
1920–21													
1921–22	0	0	.36	3.89	19.1	1.02	.29	0	0	0	0	0	1.94
1922–23													
1923–24	0	0	0	0	0	0	0	0	0	0	0	0	0
1924–25	0	0	.22	.47	5.95	.21	0	0	0	0	0	0	.53
1925–26	0	0	0	.09	3.13	.61	1.43	.27	.15	.035	0	0	.46
1926–27	0	.93	.84	.76	6.96	1.47	1.43	.23	0				
Average	.12	.20	.54	9.61	9.34	3.47	1.43	.92	.19	.17	.13	.12	2.39

Arroyo del Valle near Livermore

[Drainage area, 149 square miles]

1911–12				7.08	4.18	20.3	5.27	3.01	1.01	0.35	0.17	0.11	
1912–13	0.05	0.16	0.19	11.7	3.58	5.29	4.08	1.81	1.10	.26	0	0	2.35
1913–14	0	0	88.6	851	415	40.0	22.1	9.64	4.16	0	0	0	118
1914–15	0	0	8.90	109	522	71.5	37.2	57.9	8.55	1.45	.14	.06	64.9
1915–16	.03	.003	19.1	630	264	94.3	24.8	10.1	4.90	0	0	0	87.2
1916–17	0	0	21.7	36.9	293	41.6	10.4	4.34	1.44	0	0	0	32.3
1917–18	0	0	0	0	5.10	42.1	3.78	1.19	0	0	0	0	4.38
1918–19	0	0	4.19	7.30	239	120	18.1	9.33	.40	0	0	0	31.8
1919–20	0	0	0	0	0	40.1	21.0	2.57	0	0	0	0	5.34
1920–21	0	0	17.7	121	42.2	13.1	5.47	2.87	.93	0	0	0	16.9
1921–22	0	0	49.7	27.6	444	61.3	21.4	5.55	1.04	0	0	0	48.1
1922–23	0	0	89.3	65.4	58.6	9.29	25.2	3.11	.28	0	0	0	20.8
1923–24	0	0	0	0	0	0	0	.08	0	0	0	0	.007
1924–25	0	0	0	2.47	49.1	6.76	7.42	3.29	2.42	.23	0	0	5.66
1925–26	0	0	0	0	249	8.58	87.0	2.07	.52	.29	.074	0	27.2
1926–27	0	69.2	10.6	17.9	281	39.0	40.3	3.61	.84				
Average	.005	4.62	20.7	118	179	38.3	20.8	7.53	1.72	.17	.03	.01	33.2

Spring Valley Water Co.'s aqueduct near Sunol [a]

1902–3								24.7	26.0	26.7	22.2	18.4	
1903–4	16.6	19.9	25.2	25.2	24.1	25.2	25.0	25.6	25.9	26.1	23.4	18.3	23.4
1904–5	18.2	19.4	20.3	24.1	24.0	24.4	25.1	25.5	26.2	25.6	22.6	16.5	22.7
1905–6	14.1	13.8	14.2	18.0	25.1	25.0	17.9	10.5	20.8	23.0	24.8	25.0	19.3
1906–7	23.1	22.1	21.8	23.4	25.7	18.8	26.3	27.1	27.0	26.7	27.2	26.5	24.6
1907–8	25.6	25.6	23.8	22.8	25.1	26.0	26.1	26.2	26.9	25.9	19.5	17.8	24.3
1908–9	15.2	15.2	15.7	16.6	7.99	19.8	24.6	26.6	25.5	24.3	25.3	24.8	20.2
1909–10	25.0	23.2	23.7	29.7	27.9	27.7	27.9	25.9	24.8	22.3	24.7	20.7	25.3
1910–11	11.1	16.0	21.3	24.3	19.4	21.6	25.0	27.0	26.7	24.8	26.4	23.6	22.3
1911–12	25.8	25.4	26.3	25.7	25.8	26.2	26.0	26.1	26.9	21.4	18.2	16.2	24.2
1912–13	15.4	13.0	16.1	21.1	26.1	27.0	32.8	27.6	22.6	18.2	13.2	16.8	20.8
1913–14	15.3	16.3	19.2	33.0	35.4	35.5	35.6	32.4	35.4	32.3	30.6	25.6	28.9
1914–15	24.3	20.1	30.4	34.8	35.3	35.4	36.1	36.8	37.3	34.8	32.0	32.1	32.4
1915–16	29.4	27.5	32.3	32.6	33.0	33.3	31.2	29.7	26.0	29.9	33.8	33.5	31.0
1916–17	24.7	33.8	32.0	32.9	32.7	33.2	34.1	33.7	31.6	27.9	33.1	31.9	31.8
1917–18	34.1	29.6	24.6	22.4	27.1	32.4	32.3	31.6	25.5	29.4	32.5	29.1	29.2
1918–19	31.2	24.0	31.3	31.5	31.8	33.0	33.0	32.7	32.6	33.0	33.1	32.9	31.7
1919–20	32.0	25.6	25.8	29.1	28.5	29.5	32.3	32.7	33.0	32.9	31.9	32.1	30.5
1920–21	30.2	31.7	30.7	30.4	32.3	32.8	33.0	33.3	33.2	33.3	33.3	33.3	32.3
1921–22	31.8	31.8	29.5	29.2	30.9	31.2	32.9	33.4	33.3	31.1	32.5	32.7	31.7
1922–23	32.0	30.9	31.6	32.2	32.6	33.3	33.2	33.5	31.2	32.6	34.9	33.3	32.6
1923–24	32.4	32.8	33.2	34.1	31.9	32.9	33.2	32.0	32.8	32.8	29.9	31.8	32.5
1924–25	32.5	29.2	30.8	32.4	33.0	32.2	33.2	34.3	30.6	31.2	31.3	39.1	32.5
1925–26	44.4	44.5	45.0	44.8	46.5	43.5	41.4	48.4	79.7	79.3	76.9	76.8	56.0
1926–27	76.9	75.8	72.2	65.6	69.8	73.6	74.8	74.7	73.5				
Average	27.6	27.0	28.2	29.8	30.5	31.4	32.2	31.7	32.6	30.2	29.7	28.7	28.7

Laguna Creek at Irvington

[Drainage area, 10.8 square miles]

1916–17	0	0.14	0.84	1.69	2.12	2.74							
1917–18	0	0	0	0	.06	.52	0.40	0.02	0	0	0	0	0.08
1918–19	0	0	0	.27	3.02	5.39	2.70	.86	.03	0	0	0	1.01

Dry Creek near Decoto

1916–17	0	0	0.24	2.63	10.9	2.85	0	0	0	0	0	0	1.32
1917–18	0	0	0	0	0	1.0	0	0	0	0	0	0	.1
1918–19	0	0	0	0	18.2	5.10	.18	0	0	0	0	0	1.85

[a] Station moved to mouth of Alameda Canyon at Niles, Oct. 1, 1926.

Monthly discharge, in second-feet, at stations in minor San Francisco Bay basins, Calif.—Continued

San Pablo Creek near San Pablo

Year	October	November	December	January	February	March	April	May	June	July	August	September	Mean
1917–18	0	0	0	0	9.2	11.1	0.2	0.03	0	0	0	0	1.7
1918–19	0	0	0	0	80.7	25.8	.2	.2	.2				

San Pablo Creek at San Pablo

Year	October	November	December	January	February	March	April	May	June	July	August	September	Mean
1917–18	0	0	0	0	4.4	15.5	0.6	0	0	0	0	0	1.7
1918–19	0	0	0	0	105	32.2	2.27	1.29	.65				

Monthly discharge, in second-feet, at stations in northern Pacific basins in California

Russian River near Ukiah

Year	October	November	December	January	February	March	April	May	June	July	August	September	Mean
1910–11												0.08	
1911–12	0.04	0.30	5.25	214	108	368	81.3	135	12.1	4.84	1.01	2.78	78.1
1912–13	3.6	443	291	761	69.4	74.2	109	16.3	7.3	2.0			

Russian River at Geyserville

Year	October	November	December	January	February	March	April	May	June	July	August	September	Mean
1910–11					3,140	3,300	1,180	534	228	117	6.7	0	
1911–12	3.4	20.7	51.8	1,050	846	1,840	718	1,020	322	85.7	16.0	70.0	504
1912–13	16.9	1,120	1,140	4,010	588	597	740	356	164	40.4	15.8		

East Fork of Russian River near Ukiah

1910–11												10.8	
1911–12	13.4	14.4	32.0	258	279	521	326	367	197	82.2	35.5	107	186
1912–13	39.7	437	355	1,140	106	182	268	226	102	76.8	23.6	2.0	248

Mattole River near Petrolia

[Drainage area, 264 square miles]

1911–12			299	5,060	3,030	2,110	1,010	1,690	436	182	89.9	179	
1912–13	191	4,230	3,090	5,960	576	675	1,360	417	199	91.9	40.9	34.7	1,410
1913–14	39.2												

South Eel River at Hullville

1922–23			215	257	439	311	723	259	247	227	214	215	
1923–24	240	218	110	56.2	64.7	69.4	56.7	63.0	64.8	69.6	65.2	48.8	93.9
1924–25	57.6	212	149	188	2,650	554	1,100	764	296	295	277	274	552
1925–26	270	261	239	177	836	194	537	225	239	240	258	246	306
1926–27	249	181	552	1,270	3,810	1,120	1,400	395	287	289	308	306	825

NOTE.—Flow is regulated at Scott Dam.

South Eel River and Snow Mountain Water & Power Co.'s tailrace near Potter Valley

1909–10			883	1,350	1,380	1,390	663	250	69.7	23.1	5.5	10.8	
1910–11	17.1	74.6	200	1,540	1,390	2,150	1,410	578	309	55.8	19.5	18.9	644
1911–12	22.8	36.2	45.5	652	377	683	551	1,000	258	53.6	17.7	50.2	313
1912–13	30.8	603	634	2,090	879	587	969	416	160	53.3	20	8.4	536
1913–14	11.6	179	1,910	6,770	3,060	1,530	906	342	179	50.6	17.1	13.6	1,240
1914–15	37.6	36.5	231	1,780	4,930	1,780	1,370	1,420	512	98.2	37.2	14.0	993
1915–16	19.4	74.0	1,140	2,890	3,480	2,020	611	292	122	54.2	23.2	14.4	889
1916–17	18.3	62.0	378	521	2,740	1,100	1,400	573	187	37.2	22.2	13.1	572
1917–18	14.3	31.0	173	123	845	1,130	602	158	44.3	14.1	10.8	14.8	259
1918–19	18.7	97.4	132	1,230	2,750	1,690	813	322	76.5	23.8	13.5	10.9	585
1919–20	12.5	19.7	186	61.3	42.0	376	1,150	187	40.5	13.0	4.3	4.7	174
1920–21	24.2	1,760	2,330	2,710	2,370	1,280	575	291	154	34.6	12.9	12.1	955
1921–22	6.0	32.2	129	269	541	778	873	429	279	305	317	312	354
1922–23	321	253	468	492	695	332	750	268	277	243	222	224	376
1923–24	244	222	118	78.0	159	72.5	60.1	63.9	61.9	59.8	59.7	30.8	102
1924–25	77.3	274	347	297	3,030	638	1,410	556	296	298	268	274	629
1925–26	259	250	253	245	1,270	262	647	251	252	250	262	257	364
Average	70.9	250	562	1,360	1,760	1,050	868	435	193	98.1	78.4	75.5	562

Monthly discharge, in second-feet, at stations in northern Pacific basins in California—Continued

South Eel River at Hearst

Year	October	November	December	January	February	March	April	May	June	July	August	September	Mean
1910–11				1,560	1,430	2,000	1,240	457	135	17.9	6.9	4.3	
1911–12	5.6	10.6	18.5	732	407	870	506	1,010	120	20	10	25.6	312
1912–13	9.5	983	705	2,170	675	486	824.	227	21.4	5.9			

Eel River at Two Rivers

1911–12			125	4,540	2,750	3,700	2,660	4,820	847	115	30.0	173	
1912–13	101	4,870	4,060	9,890	2,950	2,370	4,260	2,040	599	107	41.6	19.0	2,610

Eel River at Scotia

1910–11				21,000	15,500	12,500	9,480	4,670	2,010	336	150	112	
1911–12	75.0	294	581	15,400	8,730	11,900	5,890	11,600	2,180	538	224	692	4,840
1912–13	444	14,200	12,100	28,100	8,430	6,860	11,500	3,440	1,190	393	174	117	7,220
1913–14	110	1,850	18,100	67,500	22,600	9,890	13,100	7,130	1,330	362	208	210	11,900
1914–15	431	350	7,070	32,100									
1916–17	90.0	840	6,040	8,120	24,500	10,900	14,400	4,500	1,340	337	146	98.7	5,800
1917–18	84.0	429	2,870	2,280	12,500	11,100	6,140	1,170	367	103	59.0	81.0	3,040
1918–19	104	1,050	2,610	20,800	31,000	20,300	8,170	2,810	665	208	97.2	81.5	7,180
1919–20	99.0	134	3,300	766	388	5,530	10,000	1,490	427	202	59.4	53.7	1,870
1920–21	513	26,400	33,100	25,000	22,700	12,100	4,570	2,810	788	190	115	96.2	10,600
1921–22	108	728	6,000	3,720	20,400	12,300	10,500	4,640	1,210	210	114	91.7	4,890
1922–23	185	949	11,000	11,000	5,860	2,070	9,060	1,520	599	207	91.9	86.5	3,540
1923–24	206	157	1,350	2,580	7,380	946	703	278	75.7	25.1	22.1	19.4	1,120
1924–25	1,940	9,720	12,900	7,560	50,700	7,300	19,500	7,140	1,930	389	163	233	9,600
1925–26	188	855	3,910	5,570	32,600	4,310	4,340	1,590	342	108	51.1	40.1	4,300
1926–27	351	16,700	15,700	19,200	48,700	13,500	12,500	2,960	978	312	111	84.1	10,600
Average	329	4,940	9,110	16,900	20,800	9,420	9,320	3,850	1,030	261	119	140	6,180

Snow Mountain Water & Power Co.'s tailrace near Potter Valley

1922–23	294	228	239	265	264	265	264	265	275	241	220	222	254
1923–24	242	220	115	76.0	123	70.5	58.1	61.9	59.9	57.8	57.7	28.8	97.5
1924–25	75.3	272	305	295	276	292	278	284	294	296	266	272	267
1925–26	257	248	249	215	235	252	246	249	250	248	260	255	247
1926–27	249	250	249	234	245	241	249	249	262	263	274	276	253

Middle Fork of Eel River near Covelo

1910–11												11.9	
1911–12	14.4	43.6	36.4	1,420	1,480	947	1,180	2,470	549	81.7	23.0	132	696
1912–13	68.3	1,720	1,420	1,920	1,290	1,100	2,370	1,420	360	60.0	29.3	14.3	978
1913–14	12.7	193	1,970	6,360	2,940	3,010	4,150	1,290	492	106	20.9	15.1	1,710
1914–15	71.6	48.0	183	1,480	4,270	2,840	2,940	3,120	946	130	27.7	9.77	1,320
1915–16	12.9	129	2,520	2,020	4,200	2,790	1,530	798	325	99.7	18.1	9.42	1,200
1916–17	12.0	121	422	640	2,240	1,260	3,350	1,650	447	61.1	17.0	12.0	840
1917–18	9.50	55.1	296	424	924	1,840							
1920–21	74.8	3,280	3,520	2,760	2,480	1,990	1,330	1,310	399	74.7	20.2	9.90	1,430

South Fork of Eel River at Garberville

[Drainage area, 84 square miles]

1910–11												47.1	
1911–12	56.6	102	209	4,200	2,430	2,930	1,180	2,220	376	129	77.7	143	1,170
1912–13	134	4,110	3,220	7,100	856	1,060	1,820	510	233	110	54.5		

Van Duzen River at Bridgeville

[Drainage area, 194 square miles]

1911–12	12.6	57.2	82.1	2,440	1,390	1,120	1,010	1,410	237	53.9	16.3	66.8	657
1912–13	61.2	1,580	1,460	2,300	859	633	1,250	535	131	58.3			

Yager Creek at Carlotta

[Drainage area, 146 square miles]

1910–11												0.49	
1911–12	0.80	20.0	86.0	1,080	800	650	496	507	64.8	19.0	5.20	22.0	311
1912–13	16.3	628	931	1,180	205	270	418	136	31.9	21.2	7.06	1.25	322

Monthly discharge, in second-feet, at stations in northern Pacific basins in California—Continued

Mad River near Arcata

[Drainage area, 452 square miles]

Year	October	November	December	January	February	March	April	May	June	July	August	September	Mean
1910–11				3,390	3,020	2,190	2,160	1,320	273	82.7	36.8	25.9	
1911–12	29.5	121	262	3,760	3,270	2,110	1,540	2,290	416	125	54.8	128	1,170
1912–13	78.3	2,680	3,290	4,310	1,780	1,670	2,390	872	238	120	49.6	34.0	1,460

Redwood Creek near Korbel

[Drainage area, 81 square miles]

1911–12	6.73	30.6	39.4	660	831	368	419	664	112	28.8	15.8	29.8	265
1912–13	26.6	538	753	900	291	258	408	203	66.9	38.5			

Redwood Creek at Orick

[Drainage area, 262 square miles]

1911–12	30.0	117	183	3,050	3,530	1,420	854	1,730	318	124	141	115	961
1912–13	181	3,420	3,650	3,690	773	716	1,730	574	166	101			

Klamath River near Copco

[Drainage area, 4,300 square miles]

1923–24	1,470	1,430	1,400	2,020	1,760	1,850	1,540	1,080	751	845	1,070	1,380	1,380
1924–25	1,660	1,760	1,650	1,460	1,640	1,910	1,470	1,920	1,990	1,520	1,520	1,630	1,680
1925–26	1,630	1,470	1,840	1,440	1,500	1,300	1,300	830	1,180	1,100	1,090	1,190	1,320

Klamath River near Seiad Valley

1912–13			3,050	3,750	4,400	5,230	7,780	7,780	5,800	3,910	2,780	2,210	
1913–14	2,180	2,720	3,220	9,760	7,340	9,810	9,510	8,590	5,720	3,280	1,990	1,800	5,480
1914–15	2,920	2,870	2,960	3,410	5,790	5,710	7,170	5,900	4,780	2,520	1,490	1,330	3,890
1915–16	1,590	2,370	3,630	3,690	8,520	7,970	7,170	5,740	4,880	3,120	1,960	1,690	4,340
1916–17	1,820	2,200	2,660	2,970	3,820	4,220	6,750	7,830	6,200	3,040	1,800	1,520	3,730
1917–18	1,780	1,630	4,330	4,140	4,300	4,390	4,640	3,150	1,640	1,010	830	1,240	2,750
1918–19	1,720	2,110	2,280	3,430	5,370	5,440	7,740	4,750	2,910	2,000	1,530	1,330	3,370
1919–20	1,620	1,930	2,560	2,480	2,480	2,310	2,360	2,490	1,800	1,530	1,320	1,290	2,010
1920–21	1,610	3,740	4,240	6,670	9,120	9,130	7,390	6,930	5,130	2,260	1,390	1,520	4,900
1921–22	1,850	2,420	3,720	3,320	3,610	4,380	6,040	7,990	4,200	1,960	1,730	1,610	3,570
1922–23	1,800	2,230	2,940	5,440	4,120	2,730	3,030	2,880	2,720	1,950	1,990	1,830	2,800
1923–24	2,270	2,320	2,470	3,310	3,680	2,880	2,610	1,970	1,330	1,370	1,730	2,210	2,340
1924–25	2,720	3,950	3,720	3,870	8,890	4,580	4,860	5,380	3,690				
Average	1,990	2,540	3,210	4,330	5,500	5,290	5,930	5,490	3,910	2,330	1,710	1,630	3,560

NOTE.—Record not very satisfactory after Copco power plant was placed in operation in January, 1918.

Klamath River near Happy Camp

1911–12	1,930	2,290	2,530	4,850	7,130	5,470	5,450	8,300	6,190	3,120	2,070	2,120	4,270

Klamath River near Requa

1910–11				18,300	23,200	26,900	30,300	25,100	18,300	6,440	2,930	2,520	
1911–12	2,760	4,190	4,450	28,200	37,800	21,000	19,100	36,200	20,000	7,950	4,310	5,110	15,800
1912–13	4,530	21,800	20,100	26,600	22,100	21,200	32,100	27,900	16,600	8,360	4,860	4,340	17,500
1913–14	3,570	9,260	13,400	68,100	37,600	39,800	39,600	27,800	17,200	7,810	3,620	3,940	22,600
1914–15	7,500	5,930	9,800	21,700	46,400	33,400	36,400	31,400	23,500	9,970	4,130	3,190	19,200
1915–16	3,310	8,240	20,800	24,200	55,400	45,600	28,800	21,700	16,700	9,220	4,330	3,390	20,000
1916–17	3,220	6,600	9,580	11,100	23,200	19,400	33,600	29,600	18,900	6,860	3,130	2,830	13,900
1917–18	2,820	4,500	13,100	13,600	19,500	22,600	20,000	10,600	5,030	2,280	1,670	2,060	9,760
1918–19	3,130	6,180	7,840	24,200	35,400	33,300	39,800	24,300	11,000	5,030	2,550	2,600	16,100
1919–20	2,930	3,970	11,300	7,490	6,260	11,300	17,500	12,600	6,300	3,600	2,020	2,460	7,320
1920–21	5,740	30,500	37,500	40,100	49,300	34,900	25,300	25,300	18,600	6,800	2,990	2,700	23,100
1921–22	3,040	10,000	13,400	10,500	18,000	20,900	27,400	28,500	14,600	4,270	2,860	2,470	12,900
1922–23	3,280	4,050	13,100	22,600	12,200	10,700	16,300	12,400	7,610	4,070	2,970	3,020	9,350
1923–24	3,850	3,820	7,520	7,450	14,200	6,920	6,270	3,970	2,110	1,730	1,890	2,500	5,160
1924–25	6,400	23,600	15,600	19,900	63,600	17,700	32,400	22,100	11,400	4,770	2,230	3,850	18,300
1925–26	4,020	8,600	9,170	8,730	39,300	14,200	13,200	7,610	3,860				
Average	4,010	10,100	13,800	22,000	31,500	23,700	26,100	21,700	13,200	5,940	3,100	3,130	15,100

Monthly discharge, in second-feet, at stations in northern Pacific basins in California—Continued

Antelope Creek near Macdoel

Year	October	November	December	January	February	March	April	May	June	July	August	September	Mean
1921–22	16.4	18.0					27.4	137					

Butte Creek near Macdoel

1921–22	32.2	32.5	38.6					89.2					

Bear Creek near Macdoel

1921–22	6.39						19.9	72.7					

Shasta River near Montague

1911–12	142	206	224		203	158	99.5	277	216	89.1	66.9	147	
1912–13	121	260	246	295	287	266	313	308	218	148	135	114	226
1916–17	140	186	221				248	171	96.4	41.0	41.7	72.8	
1917–18	118	192	223	209	192	201	69.5	31.5	35.7	24.4	39.3	95.2	119
1918–19	149	200	213	278	398	320	261	141	52.5	25.4	32.0	53.9	176
1919–20	130	169	230	192	156	158	84.0	58.3	36.9	44.5	39.1	54.5	113
1920–21	144	412	335	562	863	595	202	267	128	17.2	25.4	73.2	298
1921–22				227	297	210	203	211	66.8				
1922–23										14.5	12.5	46.4	
1923–24	143	177	178	196	226	129	14.9	12.2	9.36	8.77	10.7	40.0	94.9
1924–25	130	164	142	173	498	226	252	151	88.8	15.9	14.5	86.2	159
1925–26	140	166	223	220	328	134	93.6	23.2	12.0	14.2	14.3	48.8	117
1926–27	115	380	536	301	490	378	348	235	151	27.0	23.3	79.4	253
Average	134	228	252	265	358	252	182	157	92.6	39.2	37.9	76.0	173

East Fork of Scott River near Callahan

1910–11		13.2	29.4	29.7	40.0	128	106	121	107	8.0	2.0	2.0	
1911–12	1.4	2.9	7.0										

Scott Creek near Scott Bar

1911–12	100	145	132	649	1,130	534	578	1,900	1,790	727	395	433	707
1912–13	400	639	541	627	691	912	1,360	1,960	1,510	454	201	109	785
1913–14	86.2	265											

Indian Creek near Happy Camp

1911–12	35.9	114	73.0	964	1,600	477	378	795	339	92.5	47.2	61.2	407

Reeve Davis flume near Happy Camp

1911–12	11.0								35.5	34.3	33.9		

Salmon River at Somesbar

1911–12	217	299	290	3,950	4,470	1,540	1,610	4,990	3,220	765	342	404	1,830
1912–13	298	2,200	1,580	1,980	2,000	1,740	3,210	4,350	2,400	843	351	277	1,760
1913–14	351	949	1,680										

Trinity River near Trinity Center

1910–11				445	595	1,390	1,480	1,560	1,510	431	145	110	
1911–12	121	124	142	665	729	640		2,850	1,790	496	155	251	

Monthly discharge, in second-feet, at stations in northern Pacific basins in California—Continued

Trinity River at Lewiston

Year	October	November	December	January	February	March	April	May	June	July	August	September	Mean
1910–11												168	
1911–12	206	222	226	1,330	1,550	1,470	1,950	5,330	3,290	784	242	423	1,420
1912–13	245	1,380	963	899	1,510	1,760	3,510	4,430	2,070	634	243	189	1,480
1913–14	168	532	1,080	5,020	3,910	5,360	6,280	6,410	3,420	1,060	254	206	2,800
1914–15	504	321	404	1,060	5,020	5,630	6,990	7,020	6,310	2,050	454	212	2,980
1915–16	189	315	1,260	939	4,550	5,380	4,320	3,740	2,790	1,100	271	176	2,070
1916–17	162	201	330	310	1,030	890	2,240	3,210	1,920	334	117	104	901
1917–18	92.3	362	689	585	1,100	1,850	2,910	1,580	500	129	76.8	161	832
1918–19	269	376	366	1,340	2,620	2,280	5,040	4,800	1,460	381	128	123	1,590
1919–20	157	165	523	428	370	686	1,540	1,820	719	196	65.6	75.4	562
1920–21	205	3,060	2,010	3,060	3,090	4,650	3,960	5,060	3,480	857	248	150	2,480
1921–22	178	352	580	494	815	1,230	2,600	4,340	1,870	329	119	73.4	1,080
1922–23	285	341	596	838	823	1,360	2,850	2,620	1,030	363	137	135	948
1923–24	269	230	300	333	1,400	519	725	442	115	42.7	41.0	41.1	367
1924–25	272	1,590	1,070	1,150	5,180	2,620	5,610	4,570	2,040	575	195	317	2,070
1925–26	235	317	697	430	3,010	2,200	4,390	1,560	474	147	76.2	80.5	1,120
1926–27	222	3,020	3,580	2,330	4,600	3,320	4,350	4,670	3,160	812	258	174	2,520
Average	229	799	917	1,280	2,540	2,580	3,700	3,850	2,170	612	183	165	1,580

Trinity River near China Flat

1911–12		676	682	4,870	6,490	4,250	4,550	10,800	6,320	1,760	637	918	
1912–13	529	3,540	2,860	3,200	4,810	4,090	7,340	7,770	3,800	1,500			

Trinity River at Hoopa

1911–12	521	734	721	7,750	8,720	6,290	5,980	13,800	6,690	1,990	835	1,250	4,600
1912–13	931	5,630	5,540	7,560	8,380	6,800	10,600	9,210	4,630	1,860	823	543	5,180
1913–14	554	2,090	4,720	33,000									
1916–17		1,110	1,860	1,660	8,600	8,590					535	418	
1917–18	559	1,290	3,030	3,000	5,690	7,930	7,140	3,380	1,520	466	305		

Coffee Creek at Coffee

1910–11				99.9	138	326	705	828	844	242	58.9	43.0	
1911–12	47.3	53.0	48.9	172	211	162		1,140	945	183	61.5	79.0	
1912–13	48.3	176	80.2	69.2	137	185	466	1,140	612	175	89.2	56.7	270
1913–14										292	79.0	52.9	

East Fork of Trinity River near Trinity Center

1910–11				156	694	758	852	790	408	36.2	7.5	9.7	
1911–12	13.1	14.4	14.1										

Swift Creek near Trinity Center

1910–11				30	45	120	315	393	399	94.1			

North Fork of Trinity River at Helena

1910–11												28.5	
1911–12	34.4	41.6	42.5	700	862	497	504	1,070	614	197	67.7	103	393
1912–13	46.9	742	384	357	641	682	976	841	416	179	63.3	26.3	444

South Fork of Trinity River near China Flat

1911–12		132	150	1,710	2,120	2,260	1,590	2,730	1,170	387	171	280	
1912–13	168	1,990	2,250	3,230	3,170	2,380	3,130	1,690	740	292			

Middle Fork of Smith River near Crescent City

[Drainage area, 146 square miles]

1911–12	103			2,400	2,200	850	564	938	277	134	94.0	134	
1912–13	177					584	946	588	262	171	90.7	82.0	
1915–16		1,190	1,300	1,860	3,060								

Monthly discharge, in second-feet, at stations in northern Pacific basins in California—Continued

North Fork of Smith River near Crescent City

[Drainage area, 81 square miles]

Year	October	November	December	January	February	March	April	May	June	July	August	September	Mean
1911–12	115			4,000	3,300	1,360	989	1,340	555	197	107	284	
1912–13	323					1,250	1,480	660	298	217	119	194	

South Fork of Smith River near Crescent City

[Drainage area, 290 square miles

1911–12	247	718	1,010	8,400	6,950	2,250	1,720	2,750	1,050	452	250	343	2,170
1912–13	427	4,530	3,020	4,750	1,500	1,780	2,840	1,980	712	528	231	219	1,880

Monthly discharge, in second-feet, at stations in Great Basin in California

Alamo River near Brawley

Year	October	November	December	January	February	March	April	May	June	July	August	September	Mean
1908–9										339	856	580	
1909–10	344	377	404	376	61.8	47.6	77.2	104	94.2			248	
1910–11	405	534	259										

Snow Creek near Whitewater

1920–21											0.68	0.66	
1921–22	0.48	0.34							13.3	6.67	3.06	1.98	
1922–23	1.60	1.50	6.56	1.51	2.04	1.77	5.80	5.04	2.05	1.43	.33	.30	2.50
1923–24	.34	.52	.72	.68	.71	.93	2.39	2.55	.84	.67	.25	.20	.90
1924–25	.25	.56	.56	.41	.70	.84	1.40	1.17	.80	.41	.54	.42	.67
1925–26	1.81	.54	.96	.44	1.37	.55	6.45	6.45	4.24	1.14	.54	.56	2.08
1926–27	.60	1.03	5.21	4.33									

Snow Creek and Southern Pacific Co.'s ditch near Whitewater

1920–21												5.55	5.17	
1921–22	6.11	4.68							26.6	17.2	11.2	8.21	
1922–23	6.91	8.18	16.4	9.08	10.4	9.32	15.5	14.0	8.47	6.30	5.30	5.26	9.58
1923–24	5.27	5.56	6.45	5.97	5.22	6.39	10.7	10.7	5.85	4.36	4.14	4.19	6.23
1924–25	4.45	4.99	6.30	5.32	5.42	6.03	10.1	9.08	6.25	4.63	4.68	4.12	5.95
1925–26	7.66	5.43	7.17	5.11	8.39	6.75	15.2	12.9	9.21	6.27	5.24	4.31	7.79
1926–27	3.98	5.14	10.5	8.28									

Southern Pacific Co.'s ditch near Whitewater

1920–21											4.86	4.51	
1921–22	5.64	4.34	10.9	8.49	14.0	10.7	11.1	14.5	13.4	10.5	8.16	6.23	9.81
1922–23	5.31	6.70	9.81	7.57	8.31	7.54	9.73	8.95	6.42	4.87	4.97	4.96	7.09
1923–24	4.93	5.04	5.73	5.29	4.51	5.46	8.33	8.11	5.01	3.69	3.89	3.99	5.33
1924–25	4.21	4.43	5.74	4.92	4.72	5.18	8.75	7.91	5.45	4.22	4.14	3.70	5.28
1925–26	5.84	4.89	6.22	4.67	7.01	6.21	8.73	6.45	4.97	5.13	4.69	3.75	5.70
1926–27	3.38	4.13	5.32	3.95	12.0	14.8	18.2	18.4	14.1	10.8	8.15	7.23	10.0

Falls Creek near Whitewater

1921–22												2.96	
1922–23	2.52	2.81	3.21	2.64	2.57	2.25	2.74	2.66	1.81	1.34	1.12	1.34	2.25
1923–24	1.47	1.81	2.32	2.26	1.81	1.96	2.49	2.13	1.15	.65	.52	.59	1.60
1924–25	.89	1.23	1.83	1.60	1.57	1.48	1.56	1.24	1.05	.76	.78	.87	1.24
1925–26	1.99	1.77	2.02	1.63	1.97	1.75	7.90	4.25	2.78	2.37	2.67	2.23	2.77
1926–27	2.33	2.63	5.67	4.22									

Owens River near Round Valley

[Drainage area, 450 square miles]

1902–3												167	
1903–4	172	163	161	157	221	260	202	300	532	428	336	281	268
1904–5	266	246	218	193	196	213	177	246	392	275	169	180	231
1905–6	180	197	179	199	205	270	345	328	624	696	535	330	341
1906–7	273	239	256	247	281	341	270	438	616	856	432	305	380
1907–8	285	252	245	227	223	279	242	274	313	289	264	222	260
1908–9	192	184	182	235	186	179	374	317	637	531	296	211	294
1909–10	188	217	249	222	201	227	237	374	519	314	216	184	262
1910–11	192	163	163	203	238	257	313	331	674	881	512	257	349
1911–12	247	229	205	172	187	215	205	218	327	206	188	175	214

Monthly discharge, in second-feet, at stations in Great Basin in California—Continued

Owens River near Round Valley—Continued

Year	October	November	December	January	February	March	April	May	June	July	August	September	Mean
1912-13	186	165	146	156	176	200	185	230	281	266	197	184	198
1913-14	161	157	147	258	196	197	589	523	650	476	428	300	340
1914-15	283	207	178	170	175	175	268	273	363	431	268	184	248
1915-16	184	165	160	177	235	223	362	308	502	376	204	208	258
1916-17	237	183	168	170	188	217	247	294	739	550	233	198	286
1917-18	200	220	185	176	174	171	225	202	466	245	166	190	218
1918-19	256	206	191	178	184	203	269	382	312	195	156	144	223
1919-20	157	152	146	152	175	205	149	202	313	184	171	162	181
1920-21	162	160	158	157	178	178	138	214	338	246	166	155	187
1921-22	140	141	140	168	197	195	329	257	572	435	220	177	247
1922-23	173	203	202	197	205	211	163	205	243	271	175	175	202
Average	207	192	184	191	201	221	264	296	471	408	267	209	259

Owens River at Pleasant Valley, near Bishop

1925-26	188	188	181	166	186	239	217	321	324	169	158	144	207
1926-27	181	224	200	190	225	294	234	332	681	530	259	224	298

Owens River near Big Pine

1905-6				436	358	438	388	200	729	2,230	1,210	448	
1806-7	339	423	510	500	493	646	315	264	660	1,280	698	310	536
1907-8	460	538	527	539	584	485	145	58.1	56.9	188	274	173	336
1908-9	298	397	409	608	541	396	311	144	910	968	286	214	457
1909-10	311	437	522	650	494	503	160	250	424	269	139	106	355
1910-11	286	415	464	498	661	636	509	194	920	1,630	544	253	584
1911-12	429	486	464	474	406	316	255	160	333	144	82.3	81.9	303
1912-13	273	380	381	401	440	421	158	62.9	112	98.7	90.8	132	244
1913-14	212	376	398	804	587	467	391	285	905	938	584	203	512
1914-15	421	451	477	520	558	449	241	273	448	590	134	138	391
1915-16	310	425	482	676	877	656	500	343	644	722	285	181	507
1916-17	530	559	527	522	698	549	353	138	498	595	241	107	442
1917-18	251	452	475	444	487	525	268	68.8	592	258	76.0	80.3	330
1918-19	466	446	444	451	462	405	253	258	315	85.1	68.6	62.9	309

1919–20	181	323	392	379	352	362	153	78.7	216	107	66.1	63.9	222
1920–21	187	358	380	400	389	240	67.3	60.9	286	151	63.5	57.0	219
1921–22	165	348	517	432	525	398	310	117	698	775	227	91.9	383
1922–23	295	429	511	481	457	312	95.9	67.7	94.6	123	71.5	87.7	251
1923–24	269	366	386	390	334	230	145	65.9	51.9	58.4	53.5	48.2	200
1924–25	99.1	255	245	268	199	133	123	91.4	198	286	130	67.0	175
1925–26	213	262	270	270	320	325	175	126	311	128	80.5	63.1	211
1926–27	210	392	356	369	437	422	227	153	470	490	179	161	321
Average	295	406	435	478	484	423	252	157	449	550	254	142	347

Owens River near Lone Pine

1908–9				625	653	437	323	123	948	1,220	288	216	
1909–10	329	482	313	800	522	514	186	199	373	221	110	94.2	345
1910–11	253	409	473	459	688	624	485	139	802	1,460	537	235	547
1911–12	426	525	514	509	411	345	283	143	291	128	59.1	63.9	308
1912–13	222	379	398	384	411	344	49.5	10.6	7.67	7.35	50.1	124	198
1913–14	152	161	365	713	693	465	334	203	837	937	543	120	459
1914–15	283	439	427	543	510	333	160	231	325	413	95.6	76.3	319
1915–16	228	412	405	648	880	687	366	263	572	514	168	26.1	429
1916–17	206	382	402	374	641	490	366	111	205	371	160	74.3	313
1917–18	11.9	74.1	99.2	68.4	82.8	260	140	12.8	248	95.5	6.37	5.67	91.9
1918–19	104												
Average	221	363	377	512	549	450	269	144	461	537	202	104	334

NOTE.—Los Angeles Aqueduct, which has its intake above this station, was formally opened Feb. 13, 1913.

Owens River near Citrus

1903–4				290	268	290	160	76.8	572	350	318	125	
1904–5	451	388	378	369	540					175			
1905–6	107	219	301										

Rock Creek at Sherwin Hill, near Bishop

1925–26	13.0	13.2	9.81	4.88	12.3	11.4	28.5	45.9	51.9	22.4	17.2	10.2	20.1
1926–27	10.1	12.8	13.1	14.5	17.4	15.2	22.2	53.8	106	95.5	36.1	17.6	34.6

Monthly discharge, in second-feet, at stations in Great Basin in California—Continued

Rock Creek near Round Valley

[Drainage area, 46 square miles]

Year	October	November	December	January	February	March	April	May	June	July	August	September	Mean
1902-3												18	
1903-4	15	18	20	17.4	20.5	23.6	21	50	91.7	60.5	59	29	35.5
1904-5	47	36	27.7	24.8	24.9	21.5	18.7	28.8	51.1	38.5	20.1	19.0	29.8
1905-6	19.3	21.1	26.9	38.8	29.7	45.7	24.6	54.2	145	[a] 150	107	47.4	59.1
1906-7	35.9	42.6	43.5	41.1	36.0	40.7	33.5	72.6	101	157	77.6	40.9	60.2
1907-8	44.6	41.9	33.6	29	30	27	22	25	30	52	53	36	35.3
1908-9	25	22	26	41.8	38.3	24.4	22.0	41.0	110	97.2	37.5	36.3	43.5
1909-10	29.1	32.7	49.7	44.8	41.2	29.2	27.1	42.8	65.5	56.0	36.4	25.3	40.0
1910-11	31.6	28.8	31.1	44.7	39.6	40.4	37.7	47.5	144	159	86.8	38.7	60.8
1911-12	36.1	37.9	34.6	37.4	36.4	30.7	24.9	30.2	51.0	36.2	26.8	22.8	33.8
1912-13	27.5	27.6	19.4	23.9	32.9	25.3	19.1	29.9	45.4	49.0	40.0	37.1	31.4
1913-14	27.0	25.0	26.3	72.6	45.8	31.2	28.2	63.1	113	107	68.1	38.2	53.9
1914-15	46.3	31.5	28.0	30.7	37.1	29.5	23.2	29.9	87.1	63.6	28.8	29.5	38.7
1915-16	32.3	31.0	33.3	48.6	49.5	42.4	40.4	64.4	115	74.6	46.6	41.7	51.6
1916-17	52.4	42.8	39.3	40.8	48.7	52.3	43.1	51.5	110	119	46.0	27.6	56.2
1917-18	29.6	30.2	27.5	28.8	31.4	29.1	25.3	26.3	97.7	40.5	23.4	29.9	34.9
1918-19	47.9	30.7	30.6	28.8	30.4	29.7	25.6	72.3	61.8	35.2	29.2	26.7	37.5
1919-20	29.8	33.4	33.0	30.4	27.1	24.3	22.6	42.9	61.6	34.5	26.5	24.0	32.5
1920-21	24.7	30.0	30.7	27.8	27.0	26.0	23.8	35.5	89.8	66.2	27.7	22.3	36.0
1921-22	24.5	24.1	31.9	34.5	36.8	29.7	23.9	59.5	108	86.6	47.5	29.7	44.8
1922-23	25.8	31.6	36.7	33.7	32.0	26.6	23.1	44.2	39.0	59.2	34.6	29.1	34.7
1923-24	28.7												
Average	32.4	30.9	31.5	36.0	34.8	31.5	26.5	45.6	85.9	77.1	46.1	30.9	42.5

Pine Creek at division box near Bishop

1925-26	18.5	16.1	15.4	14.3	14.6	15.3	40.7	90.8	92.7	39.3	26.1	18.8	33.6
1926-27	18.0	18.3	20.7	19.0	19.5	19.2	26.4	74.5	175	156	64.3	34.5	53.9

Pine Creek near Round Valley

[Drainage area, 32 square miles]

1902–3												4.7	
1903–4	10.8	11.8	12.6	13	12.4	12.9	9	21.7	142	70	44	12	31.0
1904–5	28	25	17.5	12.7	10.6	7.9	6.5	9.0	68.1	47.9	4.8	4.6	20.2
1905–6	8.7	8.5	9.5	13.7	8.6	14.5	8.7	16.0	130	160	105	46.2	44.1
1906–7	15.5	7.6	7.5	10.4	11.6	13.4	11.7	28.3	111	193	101	30.8	45.2
1907–8	19.3	15.3	14.4	10.1	8.2	6.2	3.6	2.8	17.5	62.0	42.0	7.5	17.4
1908–9	7.7	4.7	4.0	4.96	6.08	3.52	3.43	16.8	208	172	45.7	20.5	41.4
1909–10	10.2	5.13	8.77	8.38	6.17	3.78	7	65.1	192	36.2	8.22	3.65	29.6
1910–11	3.49	3.36	4.72	10.0	5.54	6.72	3.17	17.8	178	256	59.4	10.6	46.6
1911–12	12.2	8.69	6.73	4.81	3.14	2.23	1.43	19.2	68.2	20.5	2.63	1.45	12.6
1912–13	2.46	2.97	2.15	1.63	3.66	4.32	1.43	7.78	15.3	41.1	18.7	8.93	9.28
1913–14	4.40	4.71	3.82	20.1	5.48	3.94	3.54	35.0	138	145	65.4	4.69	36.4
1914–15	5.71	3.77	2.13	2.99	5.17	2.83	2.70	6.93	102	86.8	3.44	1.66	18.8
1915–16	4.03	2.19	3.98	5.98	12.1	5.94	8.31	18.5	100	87.9	6.43	6.09	21.8
1916–17	4.75	2.16	1.98	2.17	5.02	4.52	3.35	2.66	155	105	4.02	2.43	24.4
1917–18	1.05	1.47	4.00	4.87	5.38	4.74	1.82	1.58	118	26.1	2.31	2.09	14.3
1918–19	18.7	5.10	4.15	3.90	4.34	3.95	1.08	48.0	35.3	2.35	1.15	.31	10.8
1919–20	1.24	1.80	1.93	2.11	3.38	2.89	1.91	8.48	57.2	14.1	1.23	1.53	8.09
1920–21	2.52	3.63	2.76	2.65	2.48	1.65	1.02	1.55	85.0	33.5	2.39	1.47	11.7
1921–22	2.33	3.12	5.35	4.03	6.94	3.73	2.24	14.5	169	115	14.6	2.65	28.6
1922–23	1.77	3.16	3.90	3.78	3.56	1.70	1.34	4.74	28.6	34.3	6.39	.94	7.88
1923–24	2.36												
Average	7.96	6.21	6.09	7.11	6.49	5.57	4.16	17.3	106	85.4	26.9	8.32	24.0

Bishop Creek near Bishop

1902–3												50.5	
1903–4	38.6	28.6	27.3	27.0	31.8	42.0	56.6	149	373	233	212	64	107
1904–5	78	41	29	22.5	25.2	38.2	56.6	113	299	215	92.1	53.6	88.6
1905–6	36.1	25.6	24.3	33.4	16.4	42.0	52.8	172	382	[a] 706	350	124	164
1906–7	45.3	17.5	50.0	56.4	54.0	55.4	75.8	131	297	354	231	83.7	121
1907–8	66.0	49.4	52.5	58.8	58.6	64.3	59.7	76.6	94.5	150	143	73.7	78.9
1908–9	60.4	55.7	49.4	47.5	47.2	46.6	59.3	124	379	363	134	78.0	120
1909–10	61.4	69.2	85.5	83.9	77.5	124	85.7	186	125	134	97.6	46.9	98.1
1910–11	50.2	52.7	55.3	63.2	89.5								
Average	54.5	42.5	46.7	49.1	50.0	58.9	63.8	136	278	308	180	71.8	111

[a] Estimated.

Monthly discharge, in second-feet, at stations in Great Basin in California—Continued

Baker Creek near Big Pine

Year	October	November	December	January	February	March	April	May	June	July	August	September	Mean
1908-9				9.94	10	10.2	14.5	35.1	21.6	16.6	11.7	10.4	

Big Pine Creek near Big Pine

Year	October	November	December	January	February	March	April	May	June	July	August	September	Mean
1903-4				11	12	16.8	20.5	72.7	132	119	95.8	49	
1904-5	24	21	15	21.7	23.9	18.9	17.9	46.7	118	187	122	51.1	55.6
1905-6	13.7	9.6	12.5										
1906-7				18	20	20	38	56	110	202	118	46	
1907-8	30	24	20	[a] 20	[a] 20	[a] 23	[a] 25	28	39	131	100	50	42.5
1908-9	18.0	13.0	15.0	17.1	19.2	13.7	22.4	54.2	189	157	103	48.2	55.9
1909-10	31.9	18.3	17.0	26.0	18.1	19.5	29.7	74.0	92.6	116	82.1	37.3	46.9
1910-11	26.2	15.9	12.7	15.5	18.5								

Tinemaha Creek near Big Pine

Year	October	November	December	January	February	March	April	May	June	July	August	September	Mean
1906-7				[b] 4.9	4.4	4.0	5.3	11.0	18.0	39.0	20.0	6.1	
1907-8	5.4	5.5	5.7	6.0	5.8	4.4	4.3	4.4	8.5	32	21	9.8	9.40
1908-9	5.5	5.0	5.3	4.68	9.55	5.98	2.99	9.90	45.9	45.8	24.3	12.8	14.8
1909-10	8.49	6.87	10.2	10.7	9.14	7.53	6.74	15.6	27.4	25.9	16.2	9.04	12.8
1910-11	5.82	5.20	5.10	7.3	7.3								

Birch Creek near Big Pine

Year	October	November	December	January	February	March	April	May	June	July	August	September	Mean
1906-7				7.6	6.2	8.2	8.0	12.5	20.0	32.0	19.3	5.0	
1907-8	4.6	4.3	4.3	5.2	5.2	5.5	5.6	5.7	9.6	14.3	11.9	6.5	6.89
1908-9	4.1	3.0	3.0	4.68	6.35	4.42	7.67	12.1	37.0	41.5	13.0	6.81	12.0
1909-10	4.32	4.87	16.3	12.3	8.20	7.24	8.55	13.5	21.5	23.2	15.3	4.72	11.7
1910-11	3.81	3.62	4.06	7.26	5.71								

Taboose Creek near Aberdeen

[Drainage area, 13.9 square miles]

1905–6				3.7	2.9	3.3	5.8	10.4	21.8	46.3	25.7	15.0	
1906–7	3.7	3.6	3.5	2.3	2.3	7.3	12.0	23.0	21.0	18.0	12.0	5.0	9.48
1907–8	4.2	3.6	3.2	3.0	2.3	2.3	3.1	4.9	6.0	10.9	8.2	6.4	4.84
1908–9	4.5	4.0	5.5	4.33	4.05	2.73	4.92	8.65	25.7	22.6	9.87	5.64	8.54
1909–10	4.01	3.53	5.60	4.61	2.11	3.52	3.97	7.06	11.8	10.7	6.97	3.23	5.59
1910–11	3.35	3.0	3.0	3.5	3.4								

Goodale Creek near Aberdeen

1905–6				[a] 2.0	[a] 1.0	[a] 1.0	3.5	6.3	11.2	19.0	6.4	5.9	
1906–7	5.6	5.3	4.3	3.9	3.6	3.3	5.1	7.0	10.2	15.1	10.3	3.9	6.47
1907–8	2.8	2.8	2.8	3.0	2.6	2.6	2.7	4.4	5.8	7.3	5.0	4.1	3.82
1908–9	3.3	3.0	3.0	2.34	2.40	2.40	3.83	8.58	18.7	16.5	8.83	5.59	6.54
1909–10	4.06	4.02	4.95	3.80	3.10	3.78	4.54	8.02	10.9	7.87	4.49	3.63	5.26
1910–11	3.50	3.10	3.10	3.55	3.24								

Division Creek near Independence

1905–6				6.7	5.1	6.1	6.0	7.3	8.4	17.2	14.3	10.9	
1906–7	12.6	11.5	10.1	10.6	10.8	11.2	10.1	9.7	11.1	12.4	10.1	9.9	10.8
1907–8	10.0	9.0	7.7	7.0	6.7	5.9	5.8	7.0	7.2	7.2	7.7	7.7	7.41
1908–9	7.5	7.7	7.6	7.2	6.9	7.3	7.9	10.0	16.7	16.4	15.6	14.8	10.5
1909–10	13.4	11.9	11.2										

Sawmill Creek near Independence

1905–6				[a] 3.0	2.7	3.7	3.4	4.3	7.6	16.3	12.6	9.8	
1906–7	6.7	[a] 5.0	[a] 5.0										
1908–9				4.1	5.0	4.9	6.6	7.3	14.1	17.8	13.1	10.6	
1909–10	9.0	8.7	8.0										

[a] Estimated.

Monthly discharge, in second-feet, at stations in Great Basin in California—Continued

Oak Creek near Independence

[Drainage area, 26.9 square miles]

Year	October	November	December	January	February	March	April	May	June	July	August	September	Mean
1905–6				[a] 6.0	7.3	7.8	11.9	28.0	69.9	140	73.5	32.2	
1906–7	20.5	11.8	11.3	10.8	10.4	12.2	18.8	26.9	42.2	57.0	32.8	20.4	22.9
1907–8	14.5	13.0	13.0	10.0	9.2	9.3	12.3	15.8	21.0	29.0	22.5	15.5	15.4
1908–9	13.0	11.6	10.5	11.4	10.6	10.8	15.1	36.8	102	131	38.9	18.9	34.2
1909–10	14.5	15.0	13.6	12.2	11.1	11.8	16.3	28.8	34.9	31.6	13.9	8.56	17.7
1910–11	8.03	8.17	7.37	8.40	8.76								

Little Pine Creek near Independence

[Drainage area, 21.4 square miles]

Year	October	November	December	January	February	March	April	May	June	July	August	September	Mean
1904–5										23.5	10.9	4.6	
1905–6	3.2	3.6	3.6	4.0	2.8	4.8	8.0	29.6	96.4	127	54.4	22.9	30.0
1906–7	12.4	6.1	5.2	5.5	3.5	4.9	14.9	26.0	62.0	70.6	35.8	16.7	22.0
1907–8	6.6	7.6	6.9	4.3	2.4	3.4	7.4	15.7	21.5	29.0	19.9	8.3	11.1
1908–9	9.0	6.6	6.3	6.40	5.54	5.44	9.92	40.5	95.2	81.6	34.7	16.1	26.4
1909–10	7.88	9.82	10.8	8.60	7.22	6.57	13.6	32.8	46.4	35.5	14.1	6.88	16.7
1910–11	5.25	4.74	3.80	4.24	4.62								

Shepard Creek near Thebe

Year	October	November	December	January	February	March	April	May	June	July	August	September	Mean
1905–6				2.0	2.0	2.0	9.0	26.5	62.2	104	63.0	12.0	
1906–7	2.6	0.5	3.0	2.0	2.4	3.4	8.1	14.0	26.0	37.0	21.0	4.7	10.4
1907–8	5.1	4.7	2.9	1.3	1.3	1.3	2.6	6.2	13.4	22.0	21.0	9.6	7.62
1908–9	5.7	2.6	2.0	4.7	3.0	2.5	8.8	14.8	37.9	42.4	20.6	11.0	13.0
1909–10	4.7	3.0	3.0										

Bairs Creek near Thebe

1905-6				1.0	1.0	1.0	3.2	12.5	31.3	30.3	13.4	4.3	
1906-7	2.0	1.0	0.5	1.0	1.0	3.0	7.0	9.6	12.2	11.7	4.4	1.1	4.54
1907-8	1.7	2.1	1.5	1.0	0	0	1.2	3.0	4.0	4.5	4.0	1.6	2.05
1908-9	1.4	1.2	1.0	1.0	.5	1.5	7.7	13.0	24.0	15.2	5.0	3.9	6.28
1909-10	1.2	1.0	1.0										

George Creek near Thebe

1905-6				1.0	1.0	2.0	10.3	21.1	52.9	86.9	42.3	21.0	
1906-7	7.7	2.6	1.7	2.0	2.5	5.0	11.0	17.0	19.0	28.0	13.0	4.0	9.46
1907-8	5.2	3.8	2.3	2.7	1.9	2.2	5.3	8.0	11.0	18.0	14.0	8.1	6.88
1908-9	6.0	3.2	3.0	2.8	2.3	3.2	11.4	19.4	43.7	38.4	14.7	8.7	13.1
1909-10	3.5	2.0	1.9										

Lone Pine Creek near Lone Pine

1905-6				[a] 3.0	2.9	3.8	7.2	28.5	73.5	129	68.4	27.2	
1906-7	14	8	8	8.2	6.5	8.8	19.5	[a] 30.0	45.6	61.5	39.5	11.5	21.8
1907-8	19.6	16.2	8.5	8.0	7.7	8.2	11.3	17.4	32.0	44.0	58.0	24.0	21.2
1908-9	11.3	7.6	6.3	6.97	8.76	6.10	12.2	31.3	95.0	75.1	43.3	21.6	27.1
1909-10	9.05	7.81	8.01	6.39	8.04	6.29	10.4	24.5	32.2	31.3	21.2	14.0	14.9
1910-11	9.23	5.80	5.87	5.56	7.00								

Tuttle Creek near Lone Pine

1905-6				[a] 5.0	4.8	4.3	5.4	11.1	26.0	54.1	33.1	14.2	
1906-7	9.6	9.0	8.0	7.4	8.5	7.4	7.3	[a] 9.0	17.1	18.8	15.0	7.1	10.4
1907-8	7.8	7.6	5.9	5.0	4.5	5.0	5.5	6.0	10	14	15	12	8.20
1908-9	8	7	7	5.1	6.1	6.0	7.43	11.8	26.6	29.9	12.8	10.2	11.5
1909-10	7.36	7.3	14.9	10.7	12.7	6.13	8.97	7.94	11.9	11.9	9.39	8.9	9.84
1910-11	7.29	6.87	6.61	6.4	7.5								

[a] Estimated.

Monthly discharge, in second-feet, at stations in Great Basin in California—Continued

Cottonwood Creek near Olancha

Year	October	November	December	January	February	March	April	May	June	July	August	September	Mean
1905–6				6.2	8.2	10.9	24.2	114	333	225	104	42.4	
1906–7	15.9	13.3	12.8	10.0	10.5	12	56.3	[a] 115	[a] 110	67.1	28.8	12.5	38.7
1907–8	28.0	18.6	15.8	[a] 12.0	12.5	22.2	58.1	62.2	48.5	31.2	18.7	18.0	28.8
1908–9	[a] 19.0	16.3	14.4	14.6	15.0	15.4	41.2	158	221	99.2	34.5	19.9	55.7
1909–10	12.6	11.0	13.1	14.2	11.9	17.2	47.2	66.7	42.0	20.4	14.3	16.2	23.9
1910–11	12.8	10.6	11.3	12.8	14.4	14.5							

Ash Creek near Olancha

1905–6				1.7	3.2	4.5	8.3	14.8	30.6	25.3	5.8	4.0	
1906–7	3.0	2.5	2.2	2.5	2.5	2.5	20	39.4	29.4	5.5	3.5	2.5	9.62
1907–8	4.0	4.5	4.0	4.0	3.7	6.6	10.9	11.5	7.3	3.2	2.2	3.0	5.41
1908–9	3.0	2.6	3.0	3.2	4.5	6.3	14.0	33.6	49.7	13.2	5.4	3.8	11.9
1909–10	3.6	3.5	3.5										

Little Rock Creek near Palmdale

[Drainage area, 78 square miles]

1895–96				18.6	18.6	54.2	7.9	1.8	0.5	0.2	0.2	0.5	
1896–97	1.0	1.5	3.8	14	52	68	106	36	6.7	.4	.2	.2	24.2
1897–98	5.5	6.9	5.7	6.06	7.00	6.04	6.10	5.20	0	0	.4	0	4.04
1898–99	0	0	0	4.90	4.41	7.66	4.50	1.50	2.00	.20	.20	.20	2.13
1899–1900	0	0	1.0										

Rock Creek near Valyermo

1922–23					15.2	17.2	20.3	16.4	13.9	10.8	7.36	6.25	
1923–24	6.65	6.93	7.00	5.27	44.9	3.97	11.8	9.95	5.13	2.97	2.43	2.61	5.77
1924–25	2.76	2.43	3.35	3.53	3.14	3.39	8.54	7.90	4.94	2.40	2.18	2.39	3.95
1925–26	2.33	2.68	3.02	3.06	4.41	6.73	78.7	45.7	25.5	15.0	8.69	6.32	16.8
1926–27	5.89	8.18	12.3	12.2	62.1	35.8	34.9	35.4	23.4	16.5	11.9	9.57	22.0

Mohave River at Victorville

[Drainage area, 400 square miles]

1898–99						37	37	33	29	27	24	22	
1899–1900	23	27	32	44	49	57	35	33	30	26	29	29	34.5
1900–1901	32	139	33	183	925	178	44	49	42	40	50	55	148
1901–2	69	77	73	50	60	66	59	43	50	40	40	44	55.9
1902–3	47	46	64	57	63	503	765	47	39	37	39	41	148
1903–4	52	55	58	60	57	58	45	80	38	33	35	34	47.7
1904–5	48	50	59	60.1	309	[a]695	110	164	43.4	32.3	31.6	40.0	135
1905–6	46.5	64.0	67.0										

Rush Creek near Mono Lake

1910–11			46.7	50.4	82.1	78.6	422	730	968	554	146	47.6	
1911–12	34.1	29.7	21.5	20.0	16.0					93.5	40.9	17.7	
1912–13	14.3	13.9							191	144	81.8	52.0	

Leevining Creek near Mono Lake

1910–11			22.6	26.0	33.2	26.0	44.1	95.0	419	423	110	45.8	
1911–12	28.0	25.5	21.0	19.6	18.7					90.8	51.1	25.6	
1912–13	21.9	20.9	17.4					114	129	114	81.7	57.6	
1913–14	22.6	21.1	20.4						280	306	154	48.3	

East Walker River near Bridgeport

1921–22	61.5	62.7							823	519	189	70.4	
1922–23	72.8	104	121	90.2	116	171	98.4	244	294	307	138	128	157
1923–24	99.2	89.3	79.7	88.5	65.8	65.5	57.2	75.8	36.0	20.4	13.3	19.1	59.2
1924–25		[b]	[b]	[b]	[b]	65.1	136	166	199	160			
1925–26	30.4	24.1	19.2	4.9	5.0	21.2	121	227	285	255	130	82.0	101
1926–27	31.5	11.4	10.6	2.0	2.0	5.4	83.8	238	293	341	321	203	129

Robinson Creek near Bridgeport

1910–11			6.24				56	106	374	409	177	87.2	
1911–12	57.7	21.1	7.79	15.3	30.3	30.4	23.1	35.8	161	135	110	45	56.0

[a] Estimated.

[b] Reservoir gates closed, seepage about 2.0 second-feet.

Monthly discharge, in second-feet, at stations in Great Basin in California—Continued

Buckeye Creek near Bridgeport

Year	October	November	December	January	February	March	April	May	June	July	August	September	Mean
1910–11			30.0				49.5	95.9	432	399	115	65.6	
1911–12	40.2	35.9	31.8	25.5	27.0	24.7	22.8	50.1	163	90	44	29	48.7

Swager Creek near Bridgeport

1910–11									117	44.7	19.2	14.3	
1911–12	12.3	11.5	11.2	6.23	12.7	15.3	9.28	19.1	10.8	11	5.5	3.5	10.7

West Walker River near Coleville

[Drainage area, 245 square miles]

1902–3		83	75	69	79	105	246	888	1,512	402	143	75	
1903–4	67	77	67	62.7	131	187	384	919	1,188	785	332	172	364
1904–5	299	125	85.7	75.3	86.1	133	266	558	791	334	107	64.1	244
1905–6	59.4	58.1	61.9	77.6	81.6	105	360	1,140	2,050	2,180	506	192	573
1906–7	98.5	95.6	94.5	95.7	132	380	523	1,150	1,960	2,480	685	269	664
1907–8	165	140	119	116	102	165	336	548	693	460			
1908–9						75.8	323	873	1,630	830	232	87.8	
1909–10	74.2	121	110	87.1	85.0	243	636	1,030	991	381	122		
1914–15										744	161	67.1	
1915–16	[a] 58.0	[a] 48.0	[a] 45.0	[a] 80.0	88.1	201	476	827	1,200	743	253	107	344
1916–17	159	103	69	35	74	93	342	667	1,520	850	220	98.1	353
1917–18	72.5	69.1	44.0	53.7	49.9	80.5	338	598	1,290	362	110	114	265
1918–19	182	113	105	89.4	94.0	108	357	1,040	609	189	77.2	58.0	253
1919–20	56.7	68.2	71.0	73.6	76.8	95.4	202	810	918	275	104	73.0	235
1920–21	85.6	88.3	66.9	63.3	102	179	296	747	1,340	533	155	80.3	311
1921–22	58.7	53.3	47.3	47.7	50.8	58.9	133	1,060	1,810	811	188	80.3	368
1922–23	68.9	67.4	72.6	62.9	61.3	119	285	965	914	758	175	98.1	305
1923–24	90.8	55.0	44.5	41.9	46.9	47.1	157	469	106	26.9	17.4	16.1	93.6
1924–25	25.5	36.8	31.5	38.1	58.1	111	309	951	978	549	145	60.7	275
1925–26	59.9	54.3	47.9	42.7	46.9	95.7	477	717	410	101	40.0	29.9	177
1926–27	28.2	45.3	64.0	60.3	82.5	131	318	918	1,370	661	167	57.7	326
Average	94.9	79.0	69.6	66.9	80.4	136	338	844	1,160	688	197	94.7	322

NOTE.—March, 1909, station was moved downstream about half a mile.

East Fork of West Walker River near Bridgeport

1909–10								195	200	82.7	34.9		

East Fork of Carson River near Markleeville

1910–11			61.1	128	144	211	618	1,010	1,700	1,080	248	133	
1911–12	116	79.5	50.0	63.6	84.6	84.9							

Note—Records fragmentary since 1912.

East Fork of Carson River at California-Nevada State line

1910–11				224	271	376	832	1,390	2,450	1,260	370	151	
1911–12	141	[a] 118	[a] 73.2	108	95.6	98.5	165	682	808	208	75.0	59.5	220
1912–13	64.2	74.5	68.9	80.1	79.8	106	352	816	495	155	95.5	64.2	205
1913–14	51.3	61.3	87.4	325	215	555	957	2,020	1,800	744	211	108	596

Silver Creek near Markleeville

1910–11			11.7	62.7	78.8	43.2	101	166	343	104	43.1	11.3	
1911–12	11.4	[a] 10.0	[a] 8.0	13.6	14.0	13.5	21.1	123	157				

Markleeville Creek near Markleeville

1911–12				6.67	9.10	8.21				5.12	[a] 1.5		

NOTE.—Records fragmentary since 1912.

Markleeville Creek at Markleeville

1910–11			22.5	83.7	73.8	85.3	257	418	699	217	33.3	20.4	
1911–12	12.1	12.8	18.5	16.5	17.6	17.3				20.7			

NOTE.—Records fragmentary since 1912.

[a] Estimated.

Monthly discharge, in second-feet, at stations in Great Basin in California—Continued

Pleasant Valley Creek at Markleeville

Year	October	November	December	January	February	March	April	May	June	July	August	September	Mean
1910–11			14.8	36.4	58.2	48.4	134	255	373	102	17.5	13.0	
1911–12	3.61												

West Fork of Carson River at Woodfords

[Drainage area, 70 square miles]

1900–1901		48	53	51	111	170	234	476	289	136	77	43	
1901–2	49	56	82	107	238	138	175	287	319	121	40	32	137
1902–3	34	46	58	49	63	64	174	389	353	106	42	30	117
1903–4	31	63	66			169	305	651	368	158	74.4	67.1	
1904–5	78.4	64.6	64.5		102	125	202	271	187	75.8	28.7	23.7	
1905–6	31.3	34.4	56.5	72.3	65.3	66.5	236	925	690	324	154	50.4	225
1906–7	52.8	76.9	58.4	78.8	139	211	502	841	664	525	223	107	290
1907–8	75.8	65.8	76.8	68.2	166.6	90.3	191	228	165	58.1	75.5	35.0	99.7
1908–9	46.4	35.3	37.7	169	02	92.8	343	628	632	164	68.4	25.5	195
1909–10	52.1	139	123	44.3	73.2	156	451	376	166	69.6	27.1	27.2	142
1910–11	24.5	28.5	43.5	31	54	57	217	590	934	362	89	46	206
1911–12	42	57	53	51.7	52.1	56.8	90.5	395	279	73.1	20.6	33.8	100
1912–13	32.9	31.8	35.6	53.3	33.8	46.3	259	341	228	84.5	48.0	36.0	103
1913–14	23.0	25.1	35.2	65.0	54.1	96.7	277	648	281	172	65.2	33.1	149
1914–15	27.1	35.9	29.9	33.8	32.6	49.5	221	473	424	89.4	14.0	13.1	120
1915–16								555	306	145	47.4	25.3	
1916–17	28.4	47.9	41.5	27.8	24.6	26.5	166	484	542	129	41.2	10.8	131
1917–18	9.06	20.1	20.4	21.7	23.7	27.2	274	307	175	28.7	6.03	17.8	77.5
1918–19	13.2	17.8	26.6	25.1	31.8	33.9	396	528	108	11.5	11.4	5.9	101
1919–20	14.6	30.9	23.1	22.2	23.2	28.3	71.3	367	238	46.5	5.0	5.0	73.0
Average	37.0	48.6	51.8	57.1	71.7	89.7	252	488	367	144	57.9	33.4	142

NOTE.—No correction made for possible ice effect.

Truckee River at Tahoe

[Drainage area, 519 square miles]

1894–95										914	425	374	
1895–96	415	437	250	262	290								
1899–1900						0	0	0	52	214	232	196	
1900–1901	159	135	81	102	81	30	9	0	30	225	419	326	133
1901–2	282	247	111	125	73	52	48	97	95	204	406	350	174
1902–3	324	346	326	266	103	190	13	13	38	205	344	398	214
1903–4	374	255	260	305	111	401	610	799	899	873	787	761	536
1904–5	672	711	614	410	433	321	20.9	173	212	303	391	385	387
1905–6	390	305	271	304	396	443	488	543	594	725	753	759	498
1906–7	726	695	647	697	732	765	806	919	1,130	1,300	1,250	1,210	906
1907–8	1,100	925	823	752	666	596	212	56.8	53.9	311	453	390	528
1908–9	354	300	278	220	630	660	584	321	569	555	525	452	454
1909–10	413	374	559	883	791	982	315	148	332	656	628	436	481
1910–11	339	281	262	307	590	671	592	153	4:7	771	409	377	433
1911–12	359	365	400	422	261	229	67.0	23.5	22.1	154	425	356	257
1912–13	335	273	295	368	272	196	8.3	6.3	16.1	236	375	418	234
1913–14	364	299	263	70.1	50.1	24.0	5.0	103	188	247	342	486	204
1914–15	392	497	512	346	200	202	7.5	5.2	9.0	186	438	363	264
1915–16	288	297	292	361	315	626	34.1	17.7	12.9	96.3	479	395	269
1916–17	406	388	319	431	324	251	30.8	23.0	817	602	560	430	386
1917–18	337	300	325	354	342	316	18.0	18.0	83.8	631	638	398	314
1918–19	236	270	284	285	217	227	0	0	194	482	538	434	265
1919–20	328	352	306	303	255	248	19.3	0	50.5	364	454	255	245
1920–21	142	113	156	134	68.2	1.3	0	0	0	214	447	451	145
1921–22	318	191	150	216	280	348	123	0	0	163	453	477	226
1922–23	377	341	330	285	272	151	0	0	0	179	479	468	240
1923–24	331	338	348	379	244	283	105	114	225	134	193	249	245
1924–25	98.5	24.4	0	0	0	0	0	0	0	321	361	159	81.3
1925–26	124	79.4	63.3	50.8	54.8	17.4	0	0	199	276	130	42.5	86.7
1926–27	3.71	0	21.6	27.2	36.1	0	0	0	5.3	119	387	413	84.6
Average	357	326	305	311	289	294	147	126	224	402	473	421	307

Truckee River at Boca

1889–90						637	2,751	5,275	4,291	1,870	736	513	
1890–91	555												

Monthly discharge, in second-feet, at stations in Great Basin in California—Continued

Truckee River at Iceland

Year	October	November	December	January	February	March	April	May	June	July	August	September	Mean
1911–12											539	459	
1912–13	405	438	403	464	403	467	1,010	1,340	685	494	513	484	593
1913–14	400	409	390	867	531	1,400	2,840	3,100	2,140	856	543	529	1,170
1914–15	503	570	581	490	416	600	1,620	1,910	1,460	614	574	490	820
1915–16	402	391	433	580	679	1,930	3,060	2,250	1,750	742	631	506	1,110
1916–17	491	524	516	574	486	533	1,670	2,030	2,560	1,120	697	530	979
1917–18	438	409	447	440	493	577	1,410	1,250	779	668	692	532	679
1918–19	473	428	446	442	453	567	2,140	2,300	691	600	600	512	806
1919–20	408	415	434	411	386	492	791	1,430	673	495	502	330	565
1920–21	222	340	350	453	427	1,000	1,170	1,520	1,280	540	514	509	695
1921–22	384	308	282	395	424	499	915	3,310	2,240	648	521	504	872
1922–23	419	417	456	426	456	631	1,300	1,900	979	586	530	517	720
1923–24	422	405	407	439	434	499	488	499	284	181	220	279	372
1924–25	171	144	88.7	96.1	604	567	1,120	1,330	632	471	419	258	490
1925–26	240	185	209	202	288	523	1,100	772	411	322	212	102	361
1926–27	69.8	221	260	320	681	962	1,720	2,310	2,020	635	510	491	849
Average	363	374	380	440	477	744	1,499	1,820	1,240	598	514	440	740

Truckee River at Nevada-California State line

[Drainage area, 955 square miles]

1899–1900	35.4	581	295	392	318	797	902	1,530	950	459	396	367	612
1900–1901	481	480	467	314	1,080	1,280	1,480	2,480	1,600	686	486	472	986
1901–2	470	469	445	322	506	492	1,660	1,930	1,360	501	506	482	754
1902–3	450	416	482	522	463	686	1,300	1,860	1,150	513	490	489	718
1903–4	507	855	403	419	1,350	2,470	2,900	3,710	2,750	1,500	1,020	903	1,560
1904–5	1,030	893	834	755	754	1,100	1,110	1,450	1,120	548	503	477	881
1905–6	487	405	366	592	746	1,130	2,850	3,650	2,830	1,800	763	675	1,360
1906–7	629	670	662	702	1,220	2,590	3,880	3,980	3,570	2,720	1,680	1,430	1,980
1907–8	1,200	1,080	1,040	1,020	938	1,140	1,360	1,040	893	550	544	448	938
1908–9	445	394	370	1,930	1,150	1,170	2,810	2,960	2,850	1,320	762	642	1,400
1909–10	610	1,010	1,110	1,250	1,180	1,680	1,980	1,430	943	755	668	498	1,090
1910–11	427	418	473	664	968	1,200	3,250	3,580	4,170	2,080	673	545	1,540
1911–12	486	521	541	609	381	404	474	1,310	1,120	391	585		
Average	583	630	571	730	850	1,230	2,000	2,360	1,950	1,060	694	619	1,150

Donner Creek at Donner Lake, near Truckee,

[Drainage area, 13.6 square miles]

1909–10	----------	30.3	57.4	10.6	11.1	55.8	93.6	88.7	21.0	4.0	1.0	----------	----------

Donner Creek near Truckee

[Drainage area, 30 square miles]

1902–3	----------	14	17	54	60	83	166	267	156	23	3	1	----------
1903–4	3	92	16	29.6	145	391	312	482	326	59.4	11.4	30.6	158
1904–5	50.6	12.0	9.2	17.8	53.1	130	163	218	114	8.6	.51	3.6	65.0
1905–6	4.4	.29	1.6	38.3	32	54.5	161	506	493	269	21.4	13.5	133
1906–7	11.1	16.3	20.0	29.9	92.5	239	296	392	349	158	40.1	29.9	139
1907–8	12.1	10.3	11.2	30.7	35.9	54.3	145	147	120	44.0	10.9	8.1	52.5
1908–9	3.2	6.4	15.4	214	38.2	51.0	150	264	176	69.2	11.8	4.9	83.7
1909–10	3.4	140	208	72.0	75.6	148	252	210	59.6	10.1	1.41	1.89	98.5
1910–11	2.50	7.47	20.5	59.4	110	50.7	210	354	526	136	14.4	6.88	----------
1911–12	5.92	10.4	10.8	24.1	12.4	8.82	31.0	173	148	44.8	3.60	1.36	39.6
1912–13	2.39	11.1	4.29	6.74	2.62	6.82	47.8	71.7	28.6	8.46	37.3	1.26	19.2
1913–14	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------
1914–15	----------	----------	----------	23.5	47.4	34.3	203	313	199	40.7	10.2	9.17	----------
Average	9.86	29.1	30.4	50.0	58.7	104	178	283	225	72.6	13.8	9.35	87.6

Prosser Creek near Truckee

[Drainage area, 48 square miles]

1902–3	----------	----------	----------	----------	----------	----------	----------	----------	----------	31.3	16.8	10.5	----------
1903–4	----------	----------	75.0	102	363	329	380	433	296	128	45.8	26.4	----------
1907–8	39.5	35.3	[a] 29.0	[a] 29.0	[a] 29.1	107	177	173	160	56.0	8.9	21.9	72.1
1908–9	34.3	30.0	41.6	277	92.0	110	375	460	374	142	23.4	16.1	165
1909–10	45.6	151	187	236	245	212	299	226	175	32.0	10.0	10.7	152
1910–11	11.2	19.5	27.7	118	105	91.1	290	486	513	179	45.9	19.4	159
1911–12	22.0	26.1	10.2	[a] 16.0	19.3	26.0	63.6	99.7	----------	----------	----------	----------	----------

Prosser Creek at Boca

1888–89	----------	----------	----------	----------	----------	----------	[a] 100	259	110	17	3	2	----------
1889–90	----------	----------	----------	----------	----------	----------	340	817	580	382	102	57	----------
1890–91	42	38	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------

[a] Estimated.

[a] Estimated on account of ice.

Monthly discharge, in second-feet, at stations in Great Basin in California—Continued

South Fork of Prosser Creek near Truckee

[Drainage area, 5.8 square miles]

Year	October	November	December	January	February	March	April	May	June	July	August	September	Mean
1909–10		56.3	39.4	19.7	19.1	25.9	65.7	65.8	28.4	6.8	4.0		

Little Truckee River near Truckee

[Drainage area, 33.2 square miles]

Year	October	November	December	January	February	March	April	May	June	July	August	September	Mean
1909–10		103	76.5	46.9	56.6	172	306	332	136	29.9	1.5		

Little Truckee River at Starr

[Drainage area, 166 square miles]

Year	October	November	December	January	February	March	April	May	June	July	August	September	Mean
1902–3										89	22		
1903–4		117	63	140	467	742	981	1,010	688	209	49.3	37.8	
1904–5	115	55.6	64.6	101	89	188	334	477	337	86.3	42.1	37.4	161
1905–6	44.2	55.4	106	359	141	159	729	972	950	478	91.9	56.7	345
1906–7	60.9	79.7	103	204	229	417	974	908	761	461	149	95.4	370
1907–8	97.3	96.9	122	67.6	65.9	162	316	332	297	79.5	26.0	21.9	
1908–9	40.7	41.0	38.7	520	154	144	786	946	895	235	77.7	22.5	325
1909–10	34.5	200	189	366	526	484	782	552	189	33.5	12.9	17.0	282

NOTE.—Determinations during winter may be in error on account of ice. Discharge estimated Nov. 17–30, 1907.

Little Truckee River at Boca

[Drainage area, 186 square miles]

Year	October	November	December	January	February	March	April	May	June	July	August	September	Mean
1889–90							958	1,998	1,491	749	200	97	
1890–91	86												
1910–11				61.4	108	194	1,120	1,260	1,210	435	66.3	28.7	
1911–12	22.3	32.3	23.2	29.4	28.4	56.3	106	379	353	50.7	20.7	35.7	94.7
1912–13	20.5	58.4	28.6	20.5	29.7	66.6	358	471	212	57.0	28.2	21.6	114
1913–14	14.1	33.2	39.3	283	173	558	1,370	1,210	684	199	47.5	30.9	387
1914–15	34.2	28.4	25.7	23.2	40.6	107	654	630	452	105	20.1	14.4	178

Webber Creek near Truckee

[Drainage area, 14 square miles]

1909–10		63.3	42.2	28.2	21.5	53.4	143	133	32.5	2.4	1.0	

Independence Creek below Independence Lake

[Drainage area, 8.5 square miles]

1902–3		9.50	8.01	17.9	37.2	19.7	26.1	92.6	73.2	19.3	3.56	0.73
1903–4	3.22	28.0	6.88	6.24	39.7	56.5	41.4	128	114	43.7	5.97	2.41	39.8
1904–5	19.6	6.13	29.0	44.3	18.4	34.5	53.0	118	99.9	8.41	2.42	.22	36.2
1905–6	0	4.90	3.37	27.2	8.33	18.6	21.8	89.7	159	141	16.0	4.55	41.2
1906–7	15.0	11.5	27.8	37.9	32.9	64.9	65.1	124	158	[d] 64	[d] 21	[d] 13	52.9
1909–10		54.6	49.6	7.3	7.3	35.0	72.9	66.4	42.3				

Long Valley Creek near Scotts

1916–17							60.5	32.6	2.96	0	0	0.10	

Baxter Creek near Lassen [e]

1912–13						12.4	11.3	18.0	14.1	6.11	4.76	3.62	
1913–14	3.88	5.72	11.0	77.4	46.2	38.0	50.1	49.5	22.4	1.78	.42	.54	25.5
1914–15	2.62	3.38	3.48	4.45	14.8	9.09	9.63	26.7	3.98				
1917–18				.69	4.09	15.4	9.88	6.18	.34	[f]	[f]	[f]	
1918–19	.54	.41	.56	2.83	13.3	12.1	13.3	18.0	4.0	[f] .01	[f] .01	[f] .02	5.38

Schloss Creek at Lassen [e]

1914–15							1.04	2.14	0.49				
1917–18				0	0	0.28	.92	.40	.03	0	0	0	
1918–19	0	0	0	0	.06	.20	1.07	1.22	.008	0	0	0	0.214

[d] Estimated from record at Starr.

[e] Formerly called Janesville.

[f] Creek practically dry.

Monthly discharge, in second-feet, at stations in Great Basin in California—Continued

Janesville Creek at Lassen

Year	October	November	December	January	February	March	April	May	June	July	August	September	Mean
1914–15							1.97	2.53	0.94				
1917–18				0.25	0.43	1.13	2.47	1.98	.432	0.024	(f)	(f)	
1918–19	e 0.05	e 0.10	0.13	.05	1.73	1.60	3.60	3.59	.32	e.2	e 0.1	0	0.949

Susan River near Susanville

[Drainage area, 256 square miles]

Year	October	November	December	January	February	March	April	May	June	July	August	September	Mean
1899–1900									31	13	11	11	
1900–1901	17	47	60	43	308	363	371	420	56	18	10	6	143
1901–2	10	19	61										
1902–3				90		205	372	266	63	11	7	11	
1903–4	17	137	42	27	349	629	695	600	160	51	31	16	230
1904–5	22	21	47	76.9	96.9	234	264	160	61.3	23.4	12.1	12.3	85.9
1905–6	15.7	19.0	18.0										
1916–17						76.4	280	246	130	109	77.3	7.37	
1917–18	9.11	13.8	13.8	12.1	24.0	89.2	132	63.1	59.9	2.11	2.66	7.71	35.7
1918–19	13.1	14.5	10.5	13.6	47.5	98.6	274	104	85.5	65.4	2.83	3.72	60.8
1919–20	7.77	8.28	5.82	7.8	12.0	38.0	106	74.5	52.1	3.93	1.41	3.65	26.7
1920–21	6.75	26.9	37.6	114	108	246	178	217	117				
Average	13.2	34.1	32.9	48.0	135	220	297	239	81.6	33.0	17.3	8.75	97.0

Gold Run Creek near Susanville

Year	October	November	December	January	February	March	April	May	June	July	August	September	Mean
1914–15							16.5	39.1	13.8	3.68			
1915–16				13.9	37.2	39.5	35.1	35.1					

Lassen Creek near Susanville

Year	October	November	December	January	February	March	April	May	June	July	August	September	Mean
1914–15							2.27	6.55	0.95	0.06			

Willow Creek at Merrillville

1903–4										19	18	19	
1904–5	19	20	20	18.5	18.8	18.6	17.6	17.1	17.0	16.9	17.7	18.7	18.3
1905–6	21.9	22.2	24.0										

Willow Creek near Standish

1904–5				80.4	89.4	33.5	22.9	17.0	21.1	46.2	19.6	41.0	
1905–6	31.8	39.6	38.7										

Bidwell Creek near Fort Bidwell

1911–12		4.0	4.0	4.8	7.5	6.2	47.1	111	108				
1917–18				1.20	1.01	1.87	11.6	16.0	9.93	1.25	0.43	0.44	

Bidwell Creek at Fort Bidwell

[Drainage area, 27 square miles]

1917–18				6.76	5.89	12.4	32.5	34.4	15.5	3.25	2.40	3.74	
1918–19	4.25	5.50	3.5	3.0	3.0	9.76	51.7	82.0	21.0	4.94	1.57	.60	16.0

Keeno Creek near Fort Bidwell

1918–19	0	0	0	0	0	[a] 1.0	[a] 9.5	0	0	0	0	0	

Twelvemile Creek near Fort Bidwell

1917–18				2.72	2.70	4.05	16.5	39.7	14.8	1.85	1.42	1.43	
1918–19	1.81	2.59	2.02	1.2	1.2	2.86	15.8	68.6	18.3	3.25	1.28	1.27	10.1
1921–22									70.7				

[a] Estimated. [b] Formerly called Janesville. [f] Creek practically dry.

Monthly discharge, in second-feet, at stations in Great Basin in California—Continued

East Fork of Horse Creek near Fort Bidwell

Year	October	November	December	January	February	March	April	May	June	July	August	September	Mean
1917–18				[a] 0.6	[a] 0.6	1.27	0.65	0.40	[a] 0.4	[a] 0.3	[a] 0.3	[a] 0.3	
1918–19	0.4	0.3	0.2	.2	.4	2.5	7.0	.5	.4	.3	.2	.2	

West Fork of Horse Creek near Fort Bidwell

1917–18	0	0	0	0	0	2.80	0.04	0	0	0	0	0	
1918–19	0	0	0	0	0	0	9.8	0	0	0	0	0	

Rock Creek near Fort Bidwell

[Drainage area, 33 square miles]

1917–18				[a] 0.2	[a] 0.5	26.8	4.08	0.10	[a] 0.1	[a] 0.1	[a] 0.1	[a] 0.1	
1918–19	0.2	0.2	0.1	0	0	16.5	105	1.6	.04	0	0	0	

[a] Estimated.