

WATER SUPPLY OF NOME REGION, SEWARD PENINSULA, 1906.

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INTRODUCTION.

The economic working of the richer placer deposits in all portions of Alaska depends largely on the amount of water available for both washing and hydraulicking the gold-bearing gravels. The scarcity of water has led to extensive ditch construction, which has often been undertaken with but little exact information in regard to the available water supply. Many of these hydraulic works have been either financial or engineering failures, owing to insufficiency of water, and some of these failures could have been averted had reliable hydrographic data been at hand.

For this reason the United States Geological Survey started systematic measurements of the flow of Alaska streams during the summer of 1906. Owing to the smallness of the funds available the work was confined to Seward Peninsula, and especially to the streams from which water could be taken for working the rich placers near Nome, as shown on the Nome and Grand Central special topographic sheets. This area was chosen for investigation on account of its extensive operations.

These investigations consisted in (a) determining both the total flow and the distribution of the flow of various streams during the mining season; (b) collecting facts in regard to general conditions affecting water supply; and (c) gathering statistics in regard to the diversion and use of water.

GAGING STATIONS.

Measurements of discharge were made at the forty-five different gaging stations named in the subjoined list. Most of these stations are on streams so located as to be available for the placer gravel near Nome.

Gaging stations on Seward Peninsula.

1. Nome River above Miocene intake.
2. Buffalo Creek.
3. Dorothy Creek.
4. Miocene ditch at Black Point.
5. Miocene ditch at flume.
6. Hobson Creek at Miocene ditch crossing.
7. David Creek ditch intake.
8. Seward ditch intake.
9. Grand Central River (North Fork) at elevation 750 feet.
10. Grand Central River (North Fork) at elevation 1,030 feet.
11. Grand Central River (West Fork) at elevation 860 feet.
12. Grand Central River (West Fork) at elevation 1,010 feet.
13. Crater Lake outlet.
14. Grand Central River below forks.
15. Grand Central River below Nugget Creek's.
16. Gold Run.
17. Thompson Creek.
18. Nugget Creek.
19. Copper Creek.
20. Jett Creek.
21. Morning Call Creek.
22. Kruzgamepa River at outlet of Salmon Lake.
23. Crater Creek.
24. Iron Creek below mouth of Canyon Creek.
25. Iron (Dome) Creek.
26. Eldorado Creek.
27. Discovery Creek.
28. Canyon Creek.
29. Sinuk River.
30. Windy Creek.
31. North Star Creek.
32. Stewart River.
33. Slate Creek.
34. Josie Creek.
35. Irene Creek.
36. Jessie Creek.
37. Upper Oregon Creek.
38. Slate Creek.
39. Aurora Creek.
40. Penny River at elevation 420 feet.
41. Penny River at elevation 120 feet.
42. Eldorado River.
43. Fall Creek.
44. Glacier Creek.
45. Snow Gulch.

MEASUREMENTS.

The detailed results of these measurements are given in Water-Supply Paper No. 196, from which the accompanying tables, indicating the general conditions, have been taken. Table 1 shows the mean weekly water supply available during 1906 for use back of Nome. Table 2 gives the mean monthly run-off per square mile

above various stations. Table 3 gives the minimum flow for streams rising in the foothills and in the mountainous regions. These tables not only show the amount of water available in the area under investigation, but also give a basis for estimating the possible water supply to be had in other similar areas.

TABLE 1.—*Mean weekly water supply, in second-feet, available for use back of Nome, 1906.*

Date.	Available for use at elevation 250 to 275 feet, Nome River low level.	Available for use at elevation 400 to 450 feet.				Total.
		Nome River high level.	Upper Grand Central River, Thompson Creek, and Gold Run.	Nugget, Copper, and Jett creeks.	Sinuk River, Windy and North Star creeks.	
July 1-7.....	31	45	153	7	88	324
July 8-14.....	110	144	343	26	173	796
July 15-21.....	36	58	179	15	90	378
July 22-28.....	29	49	156	12	79	325
July 29-August 4.....	22	42	101	8	50	223
August 5-11.....	26	45	108	8	49	236
August 12-18.....	34	53	91	8	42	228
August 19-25.....	58	84	138	10	62	352
August 26-September 1.....	94	128	202	22	94	540
September 2-9.....	48	73	101	14	51	287
September 9-18.....	33	53	68	9	36	199
September 18-30.....	86	118	250	20	125	599
Mean.....	51	74	158	13	78	375
Maximum.....	110	144	343	26	173	796
Minimum.....	22	42	68	7	36	199

TABLE 2.—*Mean run-off at various gaging stations on Seward Peninsula.*

Station.	Drainage area (square miles).	Mean run-off (second-feet per square mile).				
		July 1-31.	July 1-4 and 11-31.	August 1-31.	September 1-30.	September 1-18.
Grand Central River (North Fork), elevation 750 feet.....	5.4	.....	^a 7.53	6.80	.....	5.85
Grand Central River (North Fork), elevation 1,030 feet.....	2.3	.....	.....	11.9	.....	9.65
Grand Central River (West Fork), elevation 860 feet.....	5.4	.....	10.3	6.02	.....	4.72
Grand Central River (West Fork), elevation 1,010 feet.....	2.8	.....	9.64	4.96	.....	3.36
Crater Lake outlet.....	1.8	.....	10.8	6.56	.....	2.89
Thompson Creek.....	2.5	.....	8.20	6.04	.....	3.04
Grand Central River below the forks.....	14.6	.....	8.36	5.84	.....	4.25
Grand Central River below Nugget Creek.....	39	.....	.....	^a 4.42	.....	3.36
Kruzgamepa River at outlet of Salmon Lake.....	81	7.05	.....	3.20	5.63	3.05
Between Grand Central River below the forks and Kruzgamepa River stations.....	66	.....	.....	2.62	.....	2.79
Nome River at Miocene intake.....	15	3.43	2.71	3.36	4.29	.....

^a Approximate.

TABLE 3.—*Minimum flow of streams in Seward Peninsula.*

STREAMS RISING IN FOOTHILLS.

Stream.	Elevation.	Date.	Minimum flow.	Drainage area.	Minimum run-off per square mile.
	<i>Feet.</i>		<i>Sec.-feet.</i>	<i>Sq. miles.</i>	<i>Sec.-feet.</i>
Iron Creek below mouth of Canyon Creek.....	450	Aug. 14.....	17.1	37	0.46
Eldorado River below mouth of Venetia Creek.....	400	.....do.....	44	51	.86
Jett Creek.....	800	Sept. 10.....	^a 4.2	1.4	3
Copper Creek.....	800	Aug. 11.....	.8	.85	.94
Nugget Creek.....	785	June 28.....	^b .96	2.1	.46
David Creek.....	590	Aug. 19.....	3.3	4.3	.77
Dorothy Creek.....	500	Aug. 18.....	2.9	2.7	1.1
Hobson Creek.....	500	July 4.....	10.5	2.6	^c 4
Slate Creek (tributary of Stewart River).....	700	Aug. 19.....	2.2	2.1	1.05
Stewart River.....	400	.....do.....	11.4	36	.32
Penny River.....	120	Aug. 1.....	^a 36	19	1.9

^a Lowest measurements obtained. The flow was less on certain dates.^b The lowest flow later in the season was 3.0 second-feet, or 1.4 second-feet per square mile on August 11.^c The flow of Hobson Creek is from large limestone springs whose catchment area may not coincide with the surface drainage basin.

STREAMS RISING IN KIGLUAIK MOUNTAINS.

Grand Central River (North Fork).....	750	July 1.....	23	5.4	4.3
Grand Central River (West Fork).....	850	Sept. 15-17.....	19	5.4	3.5
Grand Central River below the forks.....	690	Sept. 16-17.....	47	14.6	3.1
Grand Central River below Nugget Creek.....	455	.....do.....	90	39	2.3
Between Grand Central River below the forks and station at Nugget Creek.....		.....do.....	43	24.4	1.76
Crater Lake outlet.....	925	Sept. 15-17.....	3.1	1.8	1.7
Thompson Creek.....	720	Sept. 16-17.....	5	2.5	2
Windy Creek.....	630	Aug. 3.....	32	12	2.7
North Star Creek.....	930	Aug. 10.....	2.9	2.3	1.26
Sinuk River.....	770	Aug. 3.....	20	6.2	3.2
Buffalo Creek.....	800	.....do.....	9.1	4.4	2.1
Nome River.....	575	Aug. 5.....	20	15	1.3
Fox Creek.....	550	Aug. 16.....	17.3	11	1.6
Crater Creek.....	550	Sept. 16-17.....	39		
Kruzgamepa River.....	442	Aug. 19-Sept. 17.....	175	81	2.16

RAINFALL.

In connection with the stream gaging, four rainfall stations were established, as follows: Nome, claim No. 15, on Ophir Creek, foot of Salmon Lake, and Deering. Records were received only at the first three stations, where the mean monthly rainfall was as follows:

Mean monthly rainfall, in inches, at stations on Seward Peninsula, 1906.

Station.	June.	July.	August.	September.	Total, June to August.	Total, June to September.
Nome.....	Trace.	2.38	2.50	1.02	4.88	5.90
Salmon Lake.....	Trace.	4.92	3.33	3.26	8.25	11.51
Ophir.....	Trace.	3.57	1.91	(^a)	5.48	.....

^a No record.

The following statement gives briefly the climatic conditions existing in this area during the years 1899-1906:

1899. July, four rainy days; August, fourteen rainy days; September, fourteen rainy days; recorded at Teller.

1900. June and July, warm and dry, tundra fires common; August to end of September, rain.

1901. June to August, inclusive, cold and foggy with some rain; September and October, usually clear and cold with one or two hard rains of a few days' duration.

1902. June, dry; July, ten rainy days; August, six rainy days; September, three rainy days; recorded at Teller.

1903. Summer warm; little rain, but considerable fog.

1904. June, dry; rainy days as follows: Ten in July, ten in August, ten in September; temperature moderate.

1905. Very wet and cold the whole season.

1906. Very warm and dry; tundra fires common; maximum temperature 85°.