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PROFILE SURVEYS
IN
BEAR RIVER BASIN, IDAHO

PREPARED UNDER THE DIRECTION OF

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PROFILE SURVEYS IN BEAR RIVER BASIN, IDAHO.

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GENERAL FEATURES OF BEAR RIVER BASIN.

Bear River rises on the northern slope of the Uinta Mountains, in the northeastern part of Utah, and after a circuitous course—in which it leaves Utah and enters Wyoming, Utah, and Wyoming in turn and makes a long detour in Idaho—it returns to Utah and finally discharges its waters into Great Salt Lake. The maximum elevation of the upper rim of the basin is 13,000 feet above sea level.

The upper part of the basin comprises a rough, broken country, well drained by numerous short streams, most of which are confined to steep, narrow canyons. The streams are fed by many small springs and by the melting of the snow which forms the greater part of the precipitation. The rocks of the extreme headwater region are chiefly sandstones and quartzites and are covered with a thin layer of soil that supports scattered groves of fir and aspen. A few small lakes lie near the head of the river.

Just below Dingle the main stream passes through the north end of Bear Lake Valley in a well-defined channel, and from this point to Preston it occupies a steep-walled canyon, broken here and there by short, narrow valleys containing irrigated farms. The tributaries in this stretch are few, the largest being Mink and Cottonwood creeks. About 10 miles below Dingle the river receives the outlet of Bear Lake, a small, crooked, sluggish stream that discharges but little water at any time, though it is the only visible outlet of a water body about 144 square miles in area. There is no storage on the main stream, but on Mink Creek a number of small storage reservoirs are contemplated or in process of construction, the water to be diverted for the irrigation of lands in the northwest end of Cache Valley.

Between Preston and the lower end of Cache Valley the Bear flows sluggishly along the west side of its basin in a well-defined channel, and during extreme floods it overflows slightly and covers a very narrow strip immediately along the river. The principal tributaries in this stretch are Cub Creek and Logan River.

Cub Creek rises in the Bear River Range and flows through a steep, narrow canyon in a rough limestone country until it reaches

Cache Valley, which it crosses in a winding but well-defined channel to its junction with the Bear.

Logan River rises on the west slope of the Bear River Range, flows southwest and then northwest, and unites with the Bear near Benson, Utah. Its basin is rough and rugged, elevations ranging from 4,500 to 9,000 feet above sea level, and the river is confined largely to a steep, rough channel in a comparatively narrow canyon. Probably three-fourths of the precipitation in this basin is snow, the melting of which supplies the principal part of the spring and summer flow; the late summer and winter flow is derived chiefly from springs, which are well distributed over the basin. In its upper course the Logan receives many short, swift tributaries. Temple Fork and South Fork, which enter, respectively, 10 miles and 15 miles above Logan, are perennial streams and furnish one-third to one-fourth of the total flow. Blacksmith Fork comes in below Logan. The entire flow of this river, after being used to develop power at two electric plants near the mouth of the canyon, is diverted for irrigation. None of the run-off is stored at present.

Practically the only inflow to the Bear in Cache Valley is from seepage and springs. The lower portions of the valley form an artesian basin containing numerous small flowing wells. The water table lies very near the surface, and during the early part of the spring the lower lands are largely swamps.

The Bear River Canal Co. diverts practically the entire summer flow of the stream above Collinston to agricultural lands lying on both sides of the river below Bear River Canyon. This system has a capacity of 1,000 second-feet, and during the winter and flood seasons a part of the water is used to develop electric power at a point about a quarter of a mile above the Collinston station and is returned to the river at Collinston. From 10 to 30 second-feet reaches the stream through leaks and as seepage from the diversion canals.

Owing to the complete control of the stream by irrigation works, the discharge is liable to extreme variation at any period.

GAGING STATIONS.

The Survey has maintained on Bear River and tributaries above the mouth of Logan River the gaging stations shown by the following list. The stations are arranged in downstream order. All stations on the main stream from source to mouth are presented first; stations on the tributaries, in regular order from source to mouth, follow. Relations of tributaries are indicated by indentation. A dash following a date indicates that the station was being maintained June 30, 1913. A period after a date indicates discontinuance.

Bear River at Dingle, Idaho, 1903-

Bear (Mud) Lake Inlet canal near Dingle, Idaho, 1911-

Bear River at Alexander, Idaho, 1911-

Bear River near Preston, Idaho, 1889-

Bear River near Collinston, Utah, 1889-
 Bear River at Fishhaven, Idaho, 1904-1906.
 Cub Creek near Franklin, Idaho, 1900-1901.
 Georgetown Creek near Georgetown, Idaho, 1911-
 West Side canal near Collinston, Utah, 1912.
 Hammond ditch near Collinston, Utah, 1912.

PUBLICATIONS.

Information concerning stream flow at the stations listed in the preceding table has been published by the Survey in the following reports:

Annual Reports: Eleventh, pt. 2; twelfth, pt. 2; thirteenth, pt. 3; fourteenth, pt. 2; sixteenth, pt. 2; eighteenth, pt. 4; nineteenth, pt. 4; twentieth, pt. 4; twenty-first, pt. 4; twenty-second, pt. 4.

Bulletins: 131, 140.

Water-Supply Papers: 11, 16, 28, 38, 51, 66, 75, 85, 100, 133, 176, 212, 250, 270, 290, 310, 330, 360.¹

Water-supply papers and other publications of the United States Geological Survey containing data in regard to the water resources of the United States may be obtained or consulted as indicated below.

1. Copies may be obtained free of charge by applying to the Director of the Geological Survey, Washington, D. C., but the edition printed for free distribution is small and is soon exhausted.

2. Copies may be purchased at nominal cost from the Superintendent of Documents, Government Printing Office, Washington, D. C., who will on application furnish lists giving prices.

3. Sets of the reports may be consulted in the libraries of the principal cities in the United States.

4. Complete sets are available for consultation in the local offices of the water-resources branch of the Geological Survey, as follows:

Albany, N. Y., Room 18, Federal Building.
 Atlanta, Ga., Post Office Building.
 St. Paul, Minn., Old Capitol Building.
 Helena, Mont., Montana National Bank Building.
 Denver, Colo., 302 Chamber of Commerce Building.
 Salt Lake City, Utah, Federal Building.
 Boise, Idaho, 615 Idaho Building.
 Portland, Oreg., 416 Couch Building.
 Tacoma, Wash., Federal Building.
 San Francisco, Cal., 328 Customhouse.
 Los Angeles, Cal., Federal Building.
 Santa Fe, N. Mex., Capitol Building.
 Honolulu, Hawaii, Kapiolani Building.

A list of the Geological Survey's publications will be sent on application to the Director of the United States Geological Survey, Washington, D. C.

¹ In preparation.