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PROFILE SURVEYS
IN
SNAKE RIVER BASIN, IDAHO

PREPARED UNDER THE DIRECTION OF

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PROFILE SURVEYS IN SNAKE RIVER BASIN, IDAHO.

Prepared under the direction of R. B. MARSHALL, *Chief Geographer.*

GENERAL FEATURES OF SNAKE RIVER BASIN.

Snake River, the largest tributary of the Columbia, rises among the high peaks of the Rocky Mountains in Yellowstone National Park, heading in the divide from which streams flow northward and eastward into the Missouri, southward to the Colorado and the lakes of the Great Basin, and westward to the Columbia. From the head-water region, including Shoshone, Lewis, and Heart lakes, in Yellowstone National Park, the river flows southward, broadening into Jackson Lake (4 miles wide and 18 miles long) and passing through Jackson Valley (8 miles wide and 40 miles long), beyond which, near the Idaho-Wyoming line, it enters a long canyon. At the south edge of Madison County, Idaho, it receives Henrys Fork, below which the Snake flows southward and westward across Idaho to a point near Homedale, near the Oregon-Idaho line, where it turns abruptly northward and beyond which it forms for about 170 miles the boundary between Idaho and Oregon and for 30 miles more that between Idaho and Washington. It enters Washington at Lewiston, flows northwest, west, and southwest, and joins the Columbia near Pasco.

Practically all the important tributaries of Snake River flow from high mountains, which are heavily timbered. The most heavily timbered areas are those at the head of the river in the Yellowstone Park region, the upper areas of Teton and Fall rivers and Henrys Fork of Snake River in eastern Idaho, and those of upper Boise and Payette rivers in central Idaho.

Precipitation in the Snake River basin ranges from 6 or 8 inches in the valley to 50 inches at the head of many of the tributaries. In the higher altitudes the precipitation is practically all in the form of snow, but the snowfall in the lower valleys, below American Falls, Idaho, is comparatively light. During the last few years there has been considerable rainfall, and dry farming has been practiced successfully in the valleys in the vicinity of Idaho Falls, Blackfoot, and St. Anthony, Idaho. The temperature in these valleys ranges from 100° in the summer to 35° below zero in the winter; in the Twin Falls and Boise valleys the temperature ranges from approximately 110° in the summer to zero in the winter.

The driest year recorded in the drainage basin was 1905; the wet years were 1896, 1899, 1904, 1907, and 1909.

The Snake River basin has many feasible storage sites, but only a very few have been developed. About 400,000 acre-feet can be stored in Jackson Lake by a dam which has been constructed by the United States Reclamation Service. The largest site is at Swan Valley, on Snake River, and the water available for storage is approximately 4,000,000 acre-feet. Reservoir sites are also found on Henrys Fork of Snake River and on Fall, Teton, Boise, and Payette rivers. Many of these sites will no doubt be used at some future time by the United States Reclamation Service in connection with the Minidoka and Payette-Boise projects.

Irrigation has reached a high stage of development in the Snake River valley, yet approximately 6,000,000 acre-feet of water annually runs to waste. Eventually these flood waters will be stored and used to irrigate thousands of acres of arid land.

The streams afford enormous water powers, but only a few sites have been developed owing to the lack of market. Large power plants have been installed at Horseshoe Bend on the Payette, at the mouth of the canyon on the Boise, and on Snake River at American Falls, Shoshone Falls, Salmon Falls, and the Minidoka dam. Many other smaller plants are also in use.

The upper drainage basin of the Snake comprises the timbered mountainous country west and southwest of Yellowstone Lake. The east side of its valley is bounded by the Wind River Range, from the slopes of which it receives a large number of tributaries, and the west side by the high Teton Mountains. Most of the drainage from the Teton Mountains flows westward through Teton River into North Fork.

Below Henrys Fork the Snake receives many tributaries, the most important of which are listed below:

Principal tributaries of Snake River.

From the left (going downstream):

Willow Creek.
Blackfoot River.
Portneuf River.
Raft River.
Goose Creek.
Rock Creek.
Salmon Falls River.
Bruneau River.
Owyhee River.
Malheur River.
Alder Creek.
Powder River.
Imnaha River.
Grande Ronde River.
Tucannon River.

From the right (going downstream):

Big Wood River.
Boise River.
Payette River.
Weiser River.
Salmon River.
Clearwater River.
Palouse River.

The results of profile surveys in the Snake River basin are shown on Plates I-III (at end of volume).

GAGING STATIONS.

The following list is arranged in downstream order, tributaries being indicated by indention. A dash following a date indicates that the station was being maintained June 30, 1913. A period following a date indicates discontinuance.

STATIONS ON SNAKE RIVER AND ITS TRIBUTARIES.

- Jackson Lake (on Snake River) near Moran, Wyo., 1908.
- Snake River at Yellowstone National Park boundary, Wyo., 1913-
- Snake River at Moran, Wyo., 1903-
- Snake River at Grovant, Wyo., 1899.
- Snake River near Lyon, Idaho, 1903-1911.
- Snake River near Heise, Idaho, 1910-
- Snake River at Idaho Falls, Idaho, 1889-1894.
- Snake River above mouth of Blackfoot River, Idaho, 1913.
- Snake River below mouth of Blackfoot River near Blackfoot, Idaho, 1910-
- Snake River at Neeley, 1906-
- Snake River below Minidoka dam, Idaho, 1910-
- Snake River near Minidoka, Idaho, 1895-1899, 1901-1910.
- Lake Milner at Milner, Idaho, 1911-
- Snake River at Milner, Idaho, 1909-
- Snake River near Twin Falls, Idaho, 1911-
- Snake River near Hagerman, Idaho, 1912-
- Snake River at King Hill, Idaho, 1909-
- Snake River at Crane Falls, Idaho, 1912-13.
- Snake River near Murphy, Idaho, 1912-
- Snake River at Weiser, Idaho, 1910-
- Snake River at Lewiston, Idaho, 1910-1913.
- Snake River at Burbank, Wash., 1907-
 - Buffalo River near Elk, Wyo., 1906.
 - Pacific Creek near Moran, Wyo., 1906.
- Snake River, Henrys Fork, near Warm River, Idaho, 1910-
- Snake River, Henrys Fork, near Ora, Idaho, 1902-1909.
- Snake River, Henrys Fork, at Ferry, Idaho, 1890.
- Snake River, Henrys Fork, near Rexburg, Idaho, 1909-
 - Warm River near Warm River, Idaho, 1912-
 - Robinson Creek near Warm River, Idaho, 1912-
- Fall River near Marysville, Idaho, 1902-3.
- Fall River at Fremont, Idaho, 1904-1909 (replaces the Marysville station).
- Fall River in canyon, Idaho, 1890-1901.
- Teton River near St. Anthony, Idaho, 1903-1909.
- Teton River at Chase's ranch, Idaho, 1890-1893.
- Willow Creek near Prospect, Idaho, 1903-4.
- Blackfoot River near Henry, Idaho, 1908-
- Blackfoot River near Presto, Idaho, 1903-1909.
- Blackfoot River near mouth, Idaho, 1913.
- Big Lost River near Chilly, Idaho, 1904-
- Big Lost River near Mackay, Idaho, 1903-1906; 1912-
 - Sharp ditch near Mackay, Idaho, 1912-
 - Streeter ditch near Mackay, Idaho, 1913-
 - Thousand Springs Creek near Chilly, Idaho, 1912-
 - Cedar Creek above forks near Mackay, Idaho, 1911-1913.

Snake River—Continued.

Big Lost River—Continued.

- Cedar Creek below forks near Mackay, Idaho, 1911–
- Little Lost River near Clyde, Idaho, 1910–1913.
- Birch Creek near Kaufman, Idaho, 1910–1912.
- Camas Creek near Hamer, Idaho, 1912–13.
- Portneuf River above reservoir, near Chesterfield, Idaho, 1912–
- Portneuf River below reservoir, near Chesterfield, Idaho, 1912–
- Portneuf River near Pebble, Idaho, 1910–1913.
- Portneuf River near Topaz, Idaho, 1913–
- Portneuf River near McCammon, Idaho, 1896.
- Portneuf River at Pocatello, Idaho, 1897–1899.
- Portneuf River near Pocatello, Idaho, 1911–
- Topons Creek near Chesterfield, Idaho, 1912–
- Pebble Creek near Pebble, Idaho, 1911–
- Birch Creek near Downey, Idaho, 1911–
- Raft River near Bridge, Idaho, 1909–
- Clear Creek near Naf, Idaho, 1910–11.
- Cassia Creek near Conant, Idaho, 1909–1912.
- Goose Creek above Trapper Creek, near Oakley, Idaho, 1911–
- Goose Creek near Oakley, Idaho, 1909–1911.
- Trapper Creek near Oakley, Idaho, 1911–
- Birch Creek near Oakley, Idaho, 1912–
- Big Cottonwood Creek near Oakley, Idaho, 1909–
- Dry Creek near Artesian City, Idaho, 1912.
- Rock Creek at Rock Creek, Idaho, 1909–1913.
- McMullen Creek near Rock Creek, Idaho, 1910 and 1912.
- Salmon Falls River near San Jacinto, Nev., 1909–
- Salmon Falls River near Twin Falls, Idaho, 1909–10.
- Cedar Creek near Roseworth, Idaho, 1909–
- Devil Creek near Three Creek, Idaho, 1912–
- Big Wood River near Gimlet, Idaho, 1904–5.
- Big Wood River near Hailey, Idaho, 1889.
- Big Wood River at Toponis, Idaho, 1896–1899.
- Big Wood River near Bellevue, Idaho, 1912–
- Big Wood River below Magic dam, near Richfield, Idaho, 1912–
- Big Wood River below North Gooding diversion, near Shoshone, Idaho, 1912–
- Big Wood River near Shoshone, Idaho, 1905–6; 1908–1913.
- Big Wood River near Bliss, Idaho, 1899.
- Little Camas Creek at Little Camas Store, Idaho, 1896.
- Camas Creek near Blaine, Idaho, 1912–
- Little Wood River near Carey, Idaho, 1904–5.
- Little Wood River at Toponis, Idaho, 1896–1899.
- Little Wood River near Richfield, Idaho, 1912–
- Dry Creek near Blanche, Idaho, 1911–
- King Hill Creek near King Hill, Idaho, 1913.
- Little Canyon Creek at Glenss Ferry, Idaho, 1909–1913.
- Alkali Creek near Glenss Ferry, Idaho, 1909–1913.
- Cold Spring Creek near Hammett (Medbury), Idaho, 1909–1913.
- Bennetts Creek near Hammett (Medbury), Idaho, 1909–1913.
- Bruneau River near Rowland, Nev., 1913–
- Bruneau River near Tindall, Idaho, 1910–
- Bruneau River near Hot Spring, Idaho, 1909–

Snake River—Continued.

- Bruneau River near Grandview, Idaho, 1895-1903; 1909-
- Sheep Creek near Tindall, Idaho, 1910-1913.
- Marys Creek at Tindall, Idaho, 1910-1912.
- Louse Creek near Wickahoney, Idaho, 1910-11.
- Bruneau River, East Fork, near Hot Spring, Idaho, 1910-
- Big Flat Creek near Three Creek, Idaho, 1912-
- Cherry Creek near Three Creek, Idaho, 1912-
- Three Creek near Three Creek, Idaho, 1912-
- Deadwood Creek near Three Creek, Idaho, 1912-
- Castle Creek near Castle Creek, Idaho, 1910-11.
- Succor Creek near Homedale, Idaho, 1903-1910.
- Owyhee River near Mountain City, Nev., 1913.
- Owyhee River at Owyhee, Oreg., 1890-1896; 1903-
- Jordan Creek near Jordan Valley, Oreg., 1911-
- Boise River near Twin Springs, Idaho, 1911-
- Boise River at Dowlings ranch, near Arrorock (Highland), Idaho, 1911-
- Boise River near Highland, Idaho, 1905-
- Boise River near Boise, Idaho, 1894-1904.
- Boise River at Caldwell, Idaho, 1895-96.
- Boise River, South Fork, near Prairie, Idaho, 1911-
- Grimes River near Centerville, Idaho, 1909-10.
- Spring Creek near Boise, Idaho, 1911-
- Malheur River, Middle Fork (head of Malheur River), above South Fork, at Riverside, Oreg., 1906-1910.
- Malheur River, Middle Fork, below South Fork, at Riverside, Oreg., 1909-
- Malheur River near Harper's ranch, near Westfall, Oreg., 1903-1905.
- Malheur River at McLaughlin's bridge, near Vale, Oreg., 1904-1906.
- Malheur River at Froman's ranch, near Harper, Oreg., 1913-
- Malheur River at Vale, Oreg., 1890-91; 1895-96; 1903-
- Malheur River at Halliday's bridge, near Ontario, Oreg., 1904-5.
- Malheur River at highway bridge, near Ontario, Oreg., 1903-4.
- Malheur River, South Fork, near Riverside, Oreg., 1910-
- Malheur River, North Fork, near Beulah, Oreg., 1909-1912.
- Bully Creek near Westfall, Oreg., 1911-1913.
- Bully Creek at Vale, Oreg., 1904-6.
- Willow Creek near Malheur, Oreg., 1904-1906; 1911-
- Willow Creek at Dell, Oreg., 1904-1906.
- Willow Creek near Brogan, Oreg., 1910-1912.
- Cow Creek near Malheur, Oreg., 1912-
- Pole Creek near Brogan, Oreg., 1912-
- Payette River near Horseshoe Bend, Idaho, 1906-
- Payette River at Payette, Idaho, 1895-1897.
- Payette River, North Fork, at Lardo, Idaho, 1908-
- Payette River, North Fork, near Van Wyck, Idaho, 1912-
- Payette River, Lake Fork, near McCall, Idaho, 1909-
- Shafer Creek near Horseshoe Bend, Idaho, 1911-1913.
- Harris Creek near Horseshoe Bend, Idaho, 1911-12.
- Lost Creek near Tamarack, Idaho, 1911-
- Weiser River, West Fork (head of Weiser River), near Fruitvale, Idaho, 1910-1912.
- Weiser River near Weiser, Idaho, 1890-91; 1894-1904; 1910-
- Weiser River, Middle Fork, at Middle Fork, Idaho, 1910-1913.
- Miller Creek near Midvale, Idaho, 1913.

Snake River—Continued.

Weiser River—Continued.

- Sage Creek near Midvale, Idaho, 1913.
- Sommercamp Creek near Midvale, Idaho, 1913.
- Crane Creek near Midvale, Idaho, 1910–
- Mann Creek near Weiser, Idaho, 1911–1913.
- Monroe Creek, upper station, near Weiser, Idaho, 1911–1913.
- Monroe Creek, lower station, near Weiser, Idaho, 1911–1913.
- Powder River at Salisbury, Oreg., 1903–1910.
- Powder River at Baker, Oreg., 1913.
- Baldock Slough (channel of Powder River) at Baker, Oreg., 1913.
- Old Settlers Slough (channel of Powder River) at Baker, Oreg., 1913.
- Powder River near North Powder, Oreg., 1909–1911, and 1913.
- Pine Creek near Baker, Oreg., 1913.
 - Goodrich Creek, North Fork, near Baker, Oreg., 1913.
 - Goodrich Creek near Baker, Oreg., 1913.
 - Mill Creek near Baker, Oreg., 1913.
 - Marble Creek near Baker, Oreg., 1913.
 - Salmon Creek near Baker, Oreg., 1913.
- Willow Creek near Haines, Oreg., 1913.
- Rock Creek near Haines, Oreg., 1913.
- North Powder River at North Powder, Oreg., 1913.
- Wolf Creek near North Powder, Oreg., 1913.
- Big Creek near Medical Springs, Oreg., 1913.
- Goose Creek near Keating, Oreg., 1913.
- Eagle Creek near Baker City, Oreg., 1909–1911.
- Eagle Creek near Newbridge, Oreg., 1911–
- Eagle Creek, West Fork, near Baker, Oreg., 1911.
- Daly Creek near Richland, Oreg., 1913.
- Salmon River near Pierson, Idaho, 1910–1913.
- Salmon River at Salmon, Idaho, 1912–
- Salmon River at Whitebird, Idaho, 1910–
- Salmon River near Whitebird, Idaho, 1910–
 - Lake Creek near Stanley, Idaho, 1910–1913.
 - Valley Creek near Stanley, Idaho, 1910–1913.
 - Pahsimeroi Creek near Goldburg, Idaho, 1910–1913.
 - Goldburg Creek near Goldburg, Idaho, 1910 and 1913.
 - Big Creek near Patterson, Idaho, 1910–1913.
- Lemhi River:
 - Timber Creek near Leadore, Idaho, 1912–13.
 - Timber Creek, West Fork, near Leadore, Idaho, 1912–13.
 - Eightmile Creek near Leadore, Idaho, 1912–13.
 - Salmon River, North Fork, near North Fork, Idaho, 1911–
- Grande Ronde River at Hilgard, Oreg., 1903–
- Grande Ronde River at Elgin, Oreg., 1903–1912.
- Grande Ronde River at Zindel, Wash., 1904–1912.
 - Catherine Creek near Union, Oreg., 1906–7; 1911–1913.
 - Wallowa Lake near Joseph, Oreg., 1905.
 - Wallowa River near Joseph, Oreg., 1903–
 - Wallowa River near Wallowa, Oreg., 1903–1907.
 - Wallowa River near Minam, Oreg., 1903–
 - Wallowa River, South Fork, near Lostine, Oreg., 1912–
 - Minam River, Minam, Oreg., 1912–

Snake River—Continued.

- Clearwater River, Lochsa Fork (head of Clearwater River), at Lowell, Idaho, 1910-
- Clearwater River at Kamiah, Idaho, 1911-
- Clearwater River near Lewiston, Idaho, 1910-1913.
 - Clearwater River, Selwai Fork, near Lowell, Idaho, 1911-
 - Clearwater River, South Fork, near Grangeville, Idaho, 1910-
 - Clearwater River, South Fork, at Kooskia, Idaho, 1910-1912.
 - Lolo Creek near Greer, Idaho, 1911-12.
- Asotin Creek at Shelman's ranch, near Asotin, Wash., 1904-1906.
- Asotin Creek near Asotin, Wash., 1904-5.
- Palouse River at Elberton, Wash., 1904-5.
- Palouse River at Hooper, Wash., 1897-
 - Rock Creek near St. John, Wash., 1903-1905.
 - Cow Creek near Keystone, Wash., 1904-5.
 - Cow Creek at Hooper, Wash., 1904.

CANALS IN SNAKE RIVER BASIN.**UPPER SNAKE RIVER BASIN.**

- North Side Minidoka canal near Minidoka, Idaho, 1909-
- South Side Minidoka canal near Minidoka, Idaho, 1909-
- North Side Twin Falls canal near Milner, Idaho, 1909-
- South Side Twin Falls canal near Milner, Idaho, 1909-
- Fort Hall upper canal near Blackfoot, Idaho, 1912-
- Fort Hall lower canal near Blackfoot, Idaho, 1912-
- Sharp ditch near Mackay, Idaho, 1912-
- Streeter ditch near Mackay, Idaho, 1913-
- Buckaroo ditch near Hot Spring, Idaho, 1912-
- Grandview canal near Comet, Idaho, 1912-
- Wilson ditch near Ontario, Oreg., 1904-5.

OWYHEE RIVER BASIN.

- Owyhee ditch near Owyhee, Oreg., 1904-5; 1911-

MALHEUR RIVER BASIN.

- Vines ditch above Vale, Oreg., 1904-5.
- Malheur Farmers' canal above Vale, Oreg., 1904-5.
- McLaughlin ditch above Vale, Oreg., 1904-5.
- J. H. ditch above Vale, Oreg., 1904-5.
- Gellerman & Frohman ditch above Vale, Oreg., 1904-5.
- Sand Hollow ditch above Vale, Oreg., 1904-5.
- Hope Mill ditch at Vale, Oreg., 1905.
- Nevada ditch below Vale, Oreg., 1904-5.

ON WALLOWA RIVER IN GRANDE RONDE BASIN.

- Silver Lake ditch near Joseph, Oreg., 1905.
- Farmers & Citizens ditch near Joseph, Oreg., 1905.
- Granger ditch at Joseph, Oreg., 1905.
- Big Bend ditch at Joseph, Oreg., 1905.
- Company ditch near Wallowa, Oreg., 1905.

PUBLICATIONS.

Information concerning stream flow at the stations indicated by the preceding table has been published in the reports of the Geological Survey listed below:

Annual Reports.—Sixteenth, Part II; Eighteenth, Part IV; Nineteenth, Part IV; Twentieth, Part IV; Twenty-first, Part IV; Twenty-second, Part IV.

Bulletins.—131, 140.

Water-Supply Papers.—11, 16, 28, 38, 51, 66, 75, 85, 100, 135, 178, 214, 252, 272, 292, 312.

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.
- Madison, Wis., 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., 505 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.

