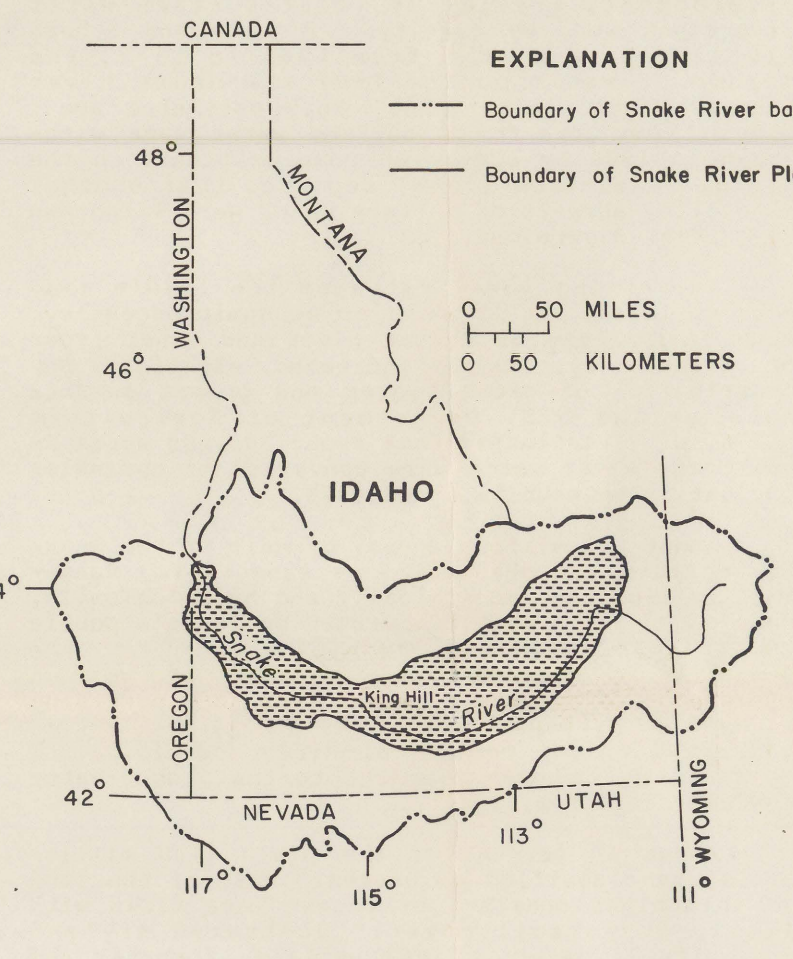


INTRODUCTION

This report is one in a series resulting from the U.S. Geological Survey's Snake River Plain RASA (Regional Aquifer-System Analysis) study that began in October 1979. One purpose of the study was to determine the hydrologic effects of the use of ground and surface water on the hydrologic system (Lindholm, 1981, p. 1). Irrigation is by far the largest water user on the Snake River Plain and is a main source of ground-water recharge. Thus, accurate irrigation water-use data are needed to assess the hydrologic effects of past, present, and future irrigation water use on the plain. The RASA study is being conducted in several steps. The first step was to determine the irrigation water use on the plain for selected years from published reports and for 1980 from Landsat data.

The purpose of this report is to present the results of the 1980 delineation of irrigated lands on the Snake River Plain. The 1980 delineation was developed by using the 1980 Landsat data and the ground-water flow models and other parts of the RASA study to help determine long-term effects of irrigation.

SNAKE RIVER PLAIN STUDY AREA



The Snake River Plain is an arcuate area of about 15,400 sq mi in Idaho and eastern Oregon. The boundary of the plain was defined on the basis of topography and geology. The plain is generally elevated from an altitude of about 4,000 ft above sea level in the east to about 2,100 ft in the west, and is flat relative to the surrounding mountains that range from 4,000 to 12,000 ft in altitude. The entire plain is drained by the Snake River and its tributaries.

The eastern part of the plain is underlain largely by Quaternary volcanic rocks (mainly basalt) with interbedded sedimentary rocks along the margins. Basalt, which constitutes most of the Snake River Plain aquifer (Hendrick, 1964), is a large, relatively uniform, and generally impermeable rock. The basalt is underlain by Quaternary and Tertiary sedimentary rocks. Sand and gravel cones and some basaltic cones near Mountain Home are the main aquifers. Contacts between sedimentary rocks underlying the plain and surrounding Tertiary and older rocks define much of the study area boundary. The geochronologic framework of the Snake River Plain was described in another RASA series report (Whitehead, 1984).

The climate of the plain is characterized as semiarid. Mean annual precipitation in the central Snake River Plain is about 10 inches. However, on the margins, higher altitudes and topographic effects result in more precipitation. As much as 20 in. annually falls on the extreme southeastern part. Most surface flow is due to ground water discharge as precipitation on surrounding mountains.

The economy of the plain is dominated by livestock agriculture. In 1980, more than 1 million of the 9.4 million acres on the plain were irrigated. Principal crops include potatoes, hay, small grains, and sugar beets. Crop water requirements account for about 80 percent of consumptive water use in Idaho (Bulley and others, 1983).

Several investigators have estimated irrigated acreage and other land uses on parts of the Snake River Plain. In 1945, the U.S. Geological Survey (USGS) estimated irrigated acreage on the Snake River Plain. In 1950, the Idaho Department of Water Resources (IDWR) estimated irrigated acreage on the Snake River Plain. In 1965, the Idaho Department of Agriculture (IDA) estimated irrigated acreage on the Snake River Plain. In 1970, the Idaho Department of Agriculture (IDA) estimated irrigated acreage on the Snake River Plain. In 1975, the Idaho Department of Agriculture (IDA) estimated irrigated acreage on the Snake River Plain. In 1980, the Idaho Department of Agriculture (IDA) estimated irrigated acreage on the Snake River Plain.

Part of the RASA study, the U.S. Geological Survey cooperated with IDWR and the U.S. Bureau of Reclamation to map 1980 land use from digital Landsat data. Accurate and current irrigated-acreage data were needed for direct input to the RASA study ground-water flow model. The 1980 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1980 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1980 irrigated-acreage data were needed for the RASA study ground-water flow model.

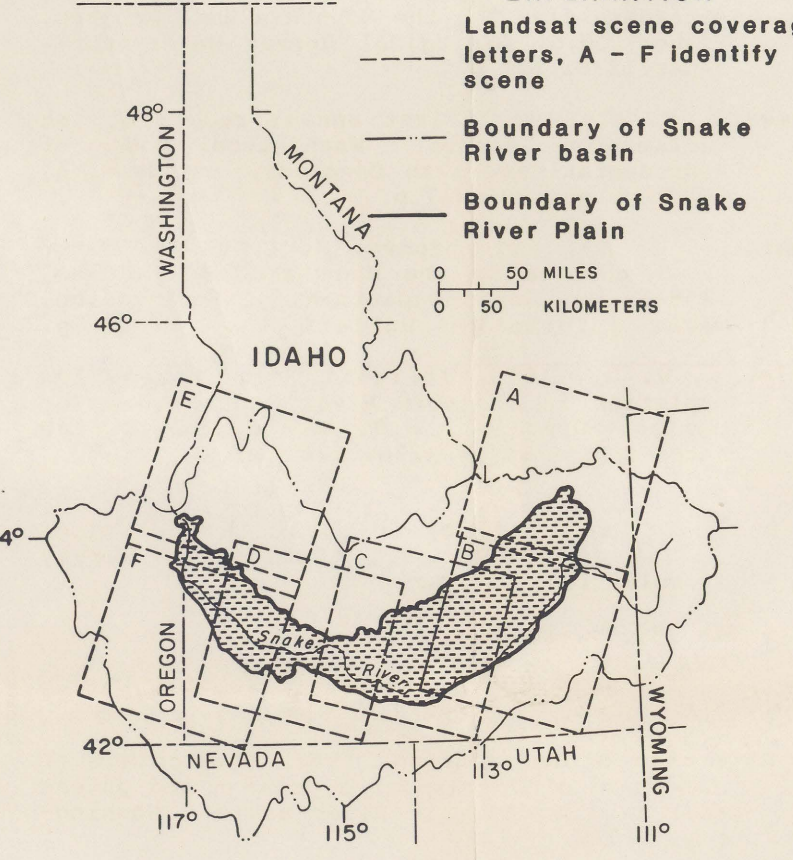
ACKNOWLEDGMENTS

The authors gratefully acknowledge the assistance of Leonard G. Taylor, U.S. Geological Survey, for his assistance and guidance with the Landsat data. The authors also acknowledge the assistance of Leonard G. Taylor, U.S. Geological Survey, for his assistance and guidance with the Landsat data. The authors also acknowledge the assistance of Leonard G. Taylor, U.S. Geological Survey, for his assistance and guidance with the Landsat data.

METHODS

The remote-sensing approach for mapping irrigated acreage and other land uses was chosen because (1) it is efficient, in terms of cost and time, relative to other means of identifying irrigated acreage; (2) it is repeatable; and (3) it is suitable for verification of results and for the determination of the statistical validity of results can be quantified.

LOCATIONS OF LANDSAT SCENES

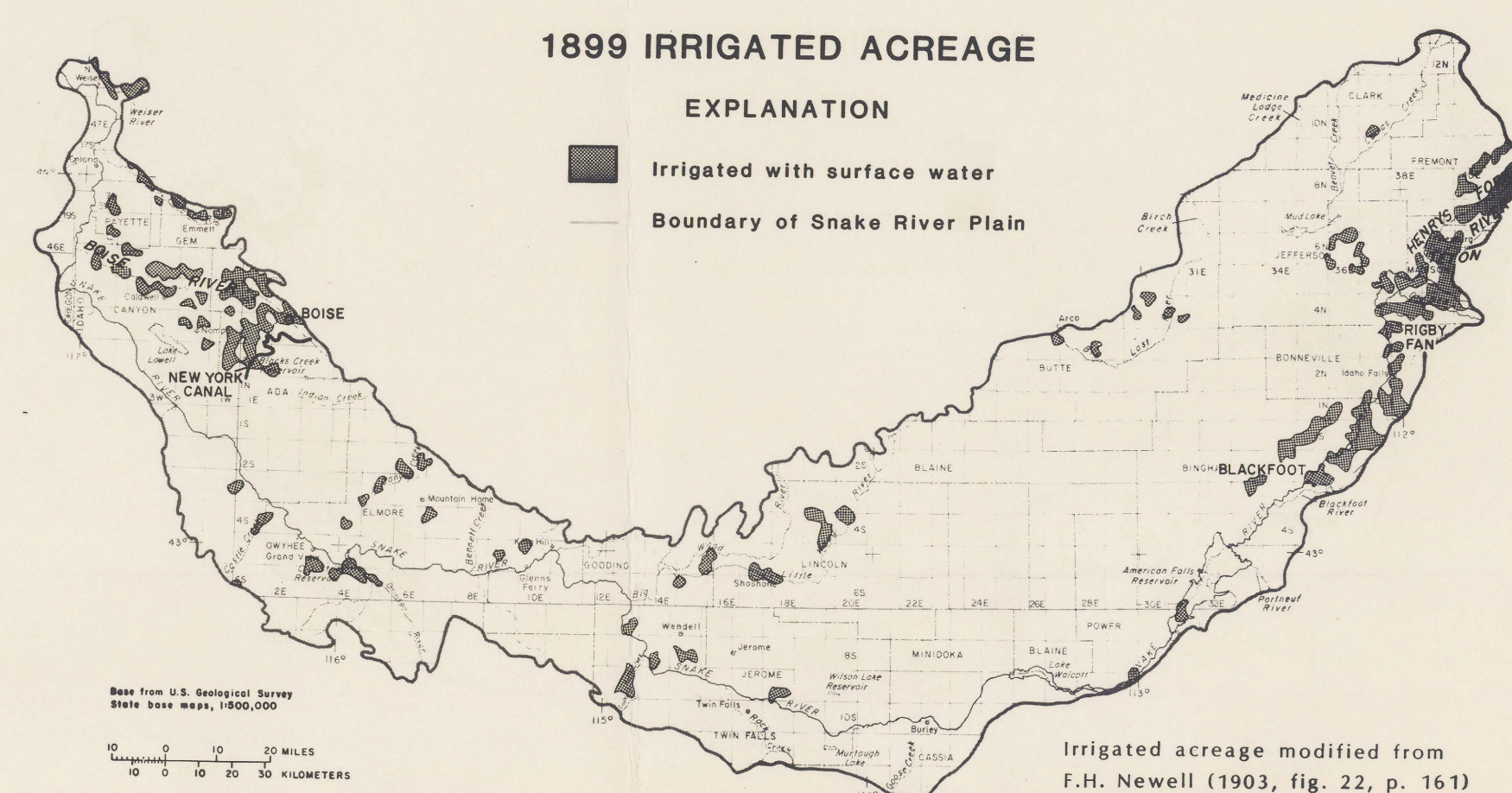


Scene	Identification number	Date
A	22028-17444	8-11-80
B	22028-17445	8-12-80
C	22028-17446	8-12-80
D	22028-17447	8-12-80
E	22028-17448	7-27-80
F	22028-17449	7-27-80
G	22028-17450	7-27-80
H	22028-17451	7-27-80
I	22028-17452	7-27-80
J	22028-17453	7-27-80

The Idaho Image Analysis Facility of the IDWR mapped the Snake River Plain from digital Landsat satellite data. The mapping was done by using the Landsat data and the ground-water flow models and other parts of the RASA study to help determine long-term effects of irrigation.

The 1980 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1980 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1980 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1980 irrigated-acreage data were needed for the RASA study ground-water flow model.

The 1980 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1980 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1980 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1980 irrigated-acreage data were needed for the RASA study ground-water flow model.



1989 IRRIGATED ACREAGE
EXPLANATION
Irrigated with surface water
Boundary of Snake River Plain
Irrigated acreage modified from F.H. Newell (1903, fig. 22, p. 163)

Irrigation has been practiced on the Snake River Plain for the past 140 years. The first reported irrigation on the Snake River Plain was in 1845 on lands adjacent to the river (Caldwell and Wells, 1977, p. 11). By 1864, most irrigable lands immediately adjacent to the river were in production. Local interest in irrigation beyond the flood plain was stimulated by irrigation of alfalfa in the Boise River valley. In 1881, founding of the Snake River Plain Irrigation Company led to the establishment of the Snake River Plain Irrigation Company. In 1883, and the subsequent influx of people, several local irrigation companies overestimated local canal systems that brought water to higher ground. Development of the resulting irrigation projects proved too expensive for small, local enterprises.

Irrigation development on the eastern plain began in about 1880 and followed the same sequence as in the Boise River valley. Initial irrigation was limited to the flood plain. Irrigation along the Snake River and along the Henrys Fork and Teton Rivers was concentrated on lands adjacent to the rivers or within reach of short canals.

Irrigated acreage maps for 1895, 1929, 1945, and 1965 were compared to the 1980 map and referenced on each map. Methods used to compile irrigated acreage differ for each year. Although estimates of irrigated acreage determined from these maps are not precise, locations and extent of irrigated areas are relatively accurate and suitable for comparison.

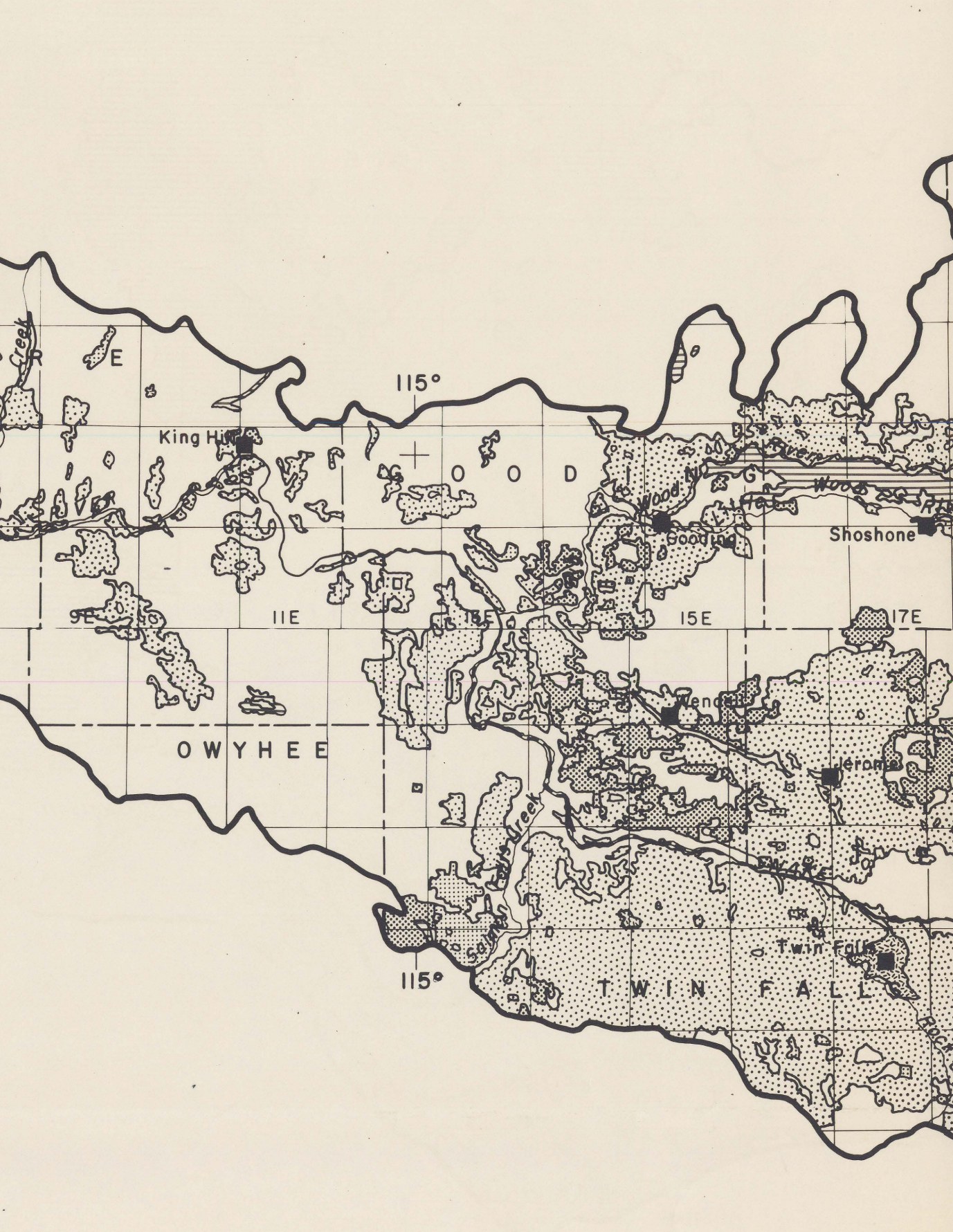
Irrigated acreage maps for 1895, 1929, 1945, and 1965 were compared to the 1980 map and referenced on each map. Methods used to compile irrigated acreage differ for each year. Although estimates of irrigated acreage determined from these maps are not precise, locations and extent of irrigated areas are relatively accurate and suitable for comparison.

1980 IRRIGATED ACREAGE AND OTHER LAND USES

EXPLANATION

Land use or class	Description	Acres	Percent of total area
Barren	Loose flows, desert, scrub, bare soil, and rocky land less covered by area has vegetation or other cover.	1,021,000	10.4
Urban	Cities, towns, and villages; transportation, power, and communication facilities; commercial and industrial complexes.	161,200	1.0
Rangeland	Grasslands, sage, upland shrubs, and mixed shrub, sedge, and sedge, including areas needed for livestock or other uses.	5,223,000	53.5
Water	Lake, reservoir, river, stream, and canal surface and water bodies.	107,400	1.1
Wetland	Marshes, mudflats, swamps, and wet meadows dominated by aquatic or hydrophytic vegetation or other cover.	36,000	.4
Forest	Deciduous, coniferous, and mixed forest land with at least 10 percent tree crown area density.	29,300	.3
Not forest	Deciduous, coniferous, and mixed forest land with less than 10 percent tree crown area density.	118,000	1.2
By land agriculture	Irrigated cropland, pasture, orchards, and nurseries; forestland and woodlands; and agriculture-associated lands.	946,000	10.1
Irrigated agriculture	Irrigated cropland, pasture, orchards, and nurseries; forestland and woodlands; and agriculture-associated lands.	946,000	10.1
Ground water	Ground water	2,029,000	20.8
Surface water	Surface water	117,000	1.2
Combined surface and ground water	Combined surface and ground water	2,146,000	22.0
Total	Total	9,746,000	100.0

Boundary of Snake River Plain



1980 IRRIGATED ACREAGE AND OTHER LAND USES
EXPLANATION
Irrigated with surface water
Boundary of Snake River Plain
Irrigated acreage modified from W.G. Hoyt (1955, p. 1)

In 1980, Congress actively encouraged reclamation of desert lands and expansion of irrigated acreage throughout the arid Western States. The Desert Land Act of 1929, a survey of the Snake River Plain, was completed in 1934. The act provided for the reclamation of the Snake River Plain. The act provided for the reclamation of the Snake River Plain. The act provided for the reclamation of the Snake River Plain.

The Snake River Plain Irrigation Company was organized in 1881. The company was organized to develop and operate irrigation projects on the Snake River Plain. The company was organized to develop and operate irrigation projects on the Snake River Plain. The company was organized to develop and operate irrigation projects on the Snake River Plain.

The Snake River Plain Irrigation Company was organized in 1881. The company was organized to develop and operate irrigation projects on the Snake River Plain. The company was organized to develop and operate irrigation projects on the Snake River Plain. The company was organized to develop and operate irrigation projects on the Snake River Plain.

The Snake River Plain Irrigation Company was organized in 1881. The company was organized to develop and operate irrigation projects on the Snake River Plain. The company was organized to develop and operate irrigation projects on the Snake River Plain. The company was organized to develop and operate irrigation projects on the Snake River Plain.

The Snake River Plain Irrigation Company was organized in 1881. The company was organized to develop and operate irrigation projects on the Snake River Plain. The company was organized to develop and operate irrigation projects on the Snake River Plain. The company was organized to develop and operate irrigation projects on the Snake River Plain.

The Snake River Plain Irrigation Company was organized in 1881. The company was organized to develop and operate irrigation projects on the Snake River Plain. The company was organized to develop and operate irrigation projects on the Snake River Plain. The company was organized to develop and operate irrigation projects on the Snake River Plain.

The Snake River Plain Irrigation Company was organized in 1881. The company was organized to develop and operate irrigation projects on the Snake River Plain. The company was organized to develop and operate irrigation projects on the Snake River Plain. The company was organized to develop and operate irrigation projects on the Snake River Plain.

The Snake River Plain Irrigation Company was organized in 1881. The company was organized to develop and operate irrigation projects on the Snake River Plain. The company was organized to develop and operate irrigation projects on the Snake River Plain. The company was organized to develop and operate irrigation projects on the Snake River Plain.

The Snake River Plain Irrigation Company was organized in 1881. The company was organized to develop and operate irrigation projects on the Snake River Plain. The company was organized to develop and operate irrigation projects on the Snake River Plain. The company was organized to develop and operate irrigation projects on the Snake River Plain.

The Snake River Plain Irrigation Company was organized in 1881. The company was organized to develop and operate irrigation projects on the Snake River Plain. The company was organized to develop and operate irrigation projects on the Snake River Plain. The company was organized to develop and operate irrigation projects on the Snake River Plain.

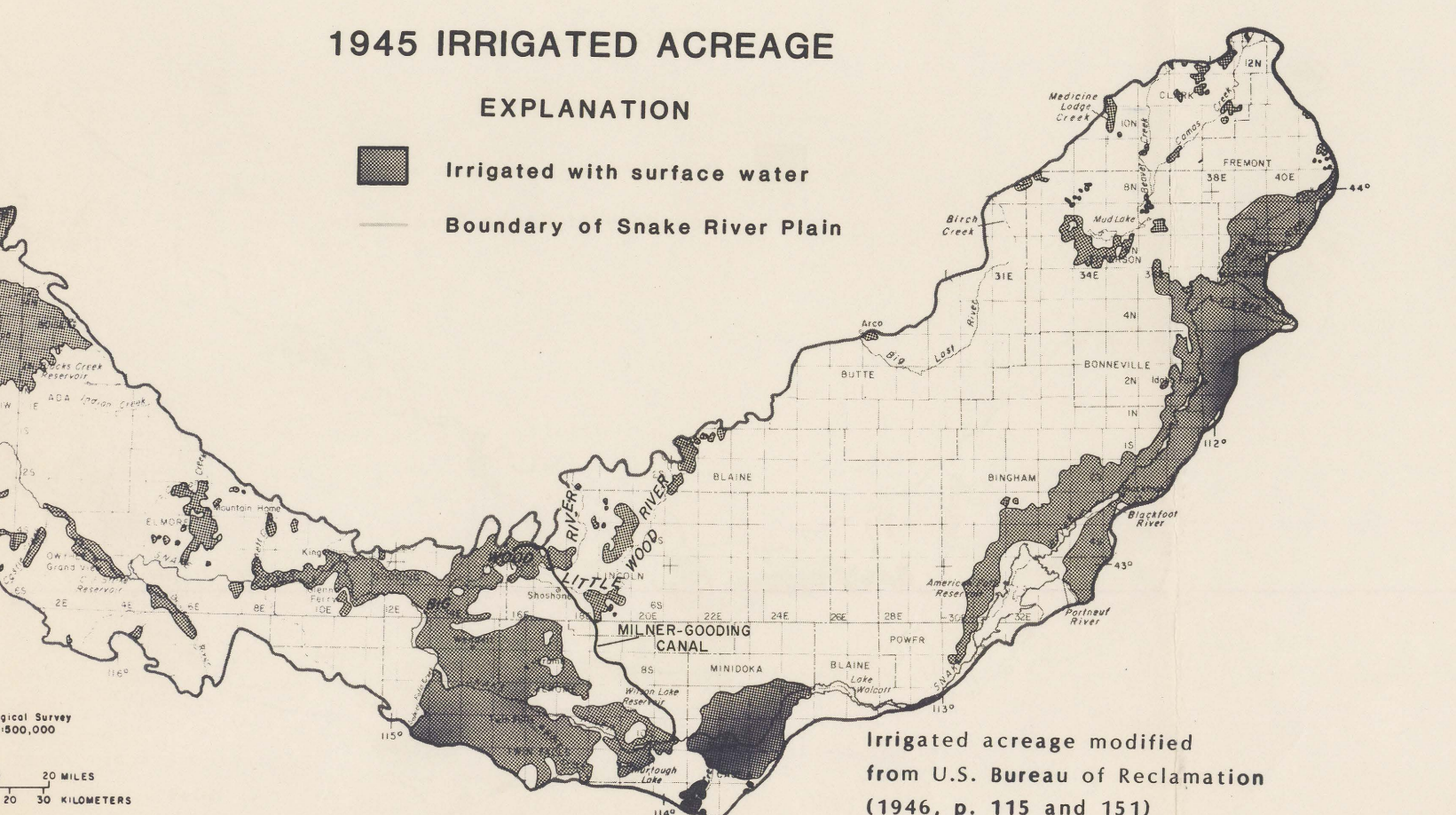
The Snake River Plain Irrigation Company was organized in 1881. The company was organized to develop and operate irrigation projects on the Snake River Plain. The company was organized to develop and operate irrigation projects on the Snake River Plain. The company was organized to develop and operate irrigation projects on the Snake River Plain.

The Snake River Plain Irrigation Company was organized in 1881. The company was organized to develop and operate irrigation projects on the Snake River Plain. The company was organized to develop and operate irrigation projects on the Snake River Plain. The company was organized to develop and operate irrigation projects on the Snake River Plain.

The Snake River Plain Irrigation Company was organized in 1881. The company was organized to develop and operate irrigation projects on the Snake River Plain. The company was organized to develop and operate irrigation projects on the Snake River Plain. The company was organized to develop and operate irrigation projects on the Snake River Plain.

The Snake River Plain Irrigation Company was organized in 1881. The company was organized to develop and operate irrigation projects on the Snake River Plain. The company was organized to develop and operate irrigation projects on the Snake River Plain. The company was organized to develop and operate irrigation projects on the Snake River Plain.

The Snake River Plain Irrigation Company was organized in 1881. The company was organized to develop and operate irrigation projects on the Snake River Plain. The company was organized to develop and operate irrigation projects on the Snake River Plain. The company was organized to develop and operate irrigation projects on the Snake River Plain.



1929 IRRIGATED ACREAGE
EXPLANATION
Irrigated with surface water
Boundary of Snake River Plain
Irrigated acreage modified from W.G. Hoyt (1955, p. 1)

In 1929, about 2.2 million acres were irrigated on the Snake River Plain. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model.

The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model.

The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model.

The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model.

The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model.

The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model.

The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model.

The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model.

The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model.

The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model.

The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model.

The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model.

The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model.

The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model.

The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model.

The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model.

The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model.

The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model.

The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model.

The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model.

The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model.

The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model.

The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model.

The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model.

The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model.

The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model.

The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model.

The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model.

The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model.

The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model.

The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model.

The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model.

The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model.

The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model.

The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model.

The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model.

The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model.

The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model.

The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model.

The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model.

The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model.

The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model.

The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model.

The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model.

The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model.

The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model.

The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model. The 1929 irrigated-acreage data were needed for the RASA study ground-water flow model.

The 1929 irrigated-acreage data were needed for the