WATER FACT SHEET

U.S. GEOLOGICAL SURVEY, DEPARTMENT OF THE INTERIOR

NATIONAL WATER-QUALITY ASSESSMENT PROGRAM—Mid-Columbia River Basin, Washington and Idaho

BACKGROUND

In 1991, the U.S. Geological Survey (USGS) began to implement a full-scale National Water-Quality Assessment (NAWQA) program. The long-term goals of the NAWQA program are to describe the status and trends in the quality of a large, representative part of the Nation's surface- and ground-water resources, and to provide a sound, scientific understanding of the primary natural and human factors affecting the quality of these resources. In meeting these goals, the program will produce a wealth of water-quality information that will be useful to policymakers and managers at the national, State, and local levels.

A major design feature of the NAWQA program is the concept of study-unit investigations, which comprise the principal building blocks on which national-level assessment activities are based. The 60 study-unit investigations that make up the program represent parts of most major river basins and aquifer systems in the Nation. These study units are 1,200 to more than 65,000 square miles in areal extent and incorporate about 60 to 70 percent of the Nation's water use and population served by public water supply. In 1991, the mid-Columbia River basin was among the first 20 NAWQA study units selected for study under the full-scale implementation plan.

STUDY UNIT DESCRIPTION

The mid-Columbia River basin, which comprises 19,000 square miles in eastern Washington and western Idaho, is drained by the Columbia River and its major tributaries, the Snake River, Crab Creek, and Palouse River. The region is dominated by agricultural activities on irrigated and nonirrigated land. The basin is underlain by massive basalt flows, and sedimentary deposits overlie the basalt over large areas. In the west-central part of the basin, floodwaters during the Pleistocene glaciation stripped away overlying sediments and left behind deep canyons and coulees. In the southeastern part of the basin, loess was deposited over undeformed basalt, which formed rolling hills. The basalt aquifers in the basin, in particular the interflow zones, are a major source of water for agricultural, domestic, and municipal use.

Most of the basin is semiarid and receives less than 15 inches of precipitation per year. Major land uses, in order of land area covered, are nonirrigated agriculture, irrigated agriculture, and livestock grazing. Over time, there has been an increase in irrigated acreage throughout the basin and a trend toward fewer, but larger, farms. Irrigation water made available by the Columbia River Irrigation Project and through drilling of deep wells in the basalts spurred growth in the area from the 1950's through the 1970's. The present population of 200,000, however, has grown slowly since the 1960's.

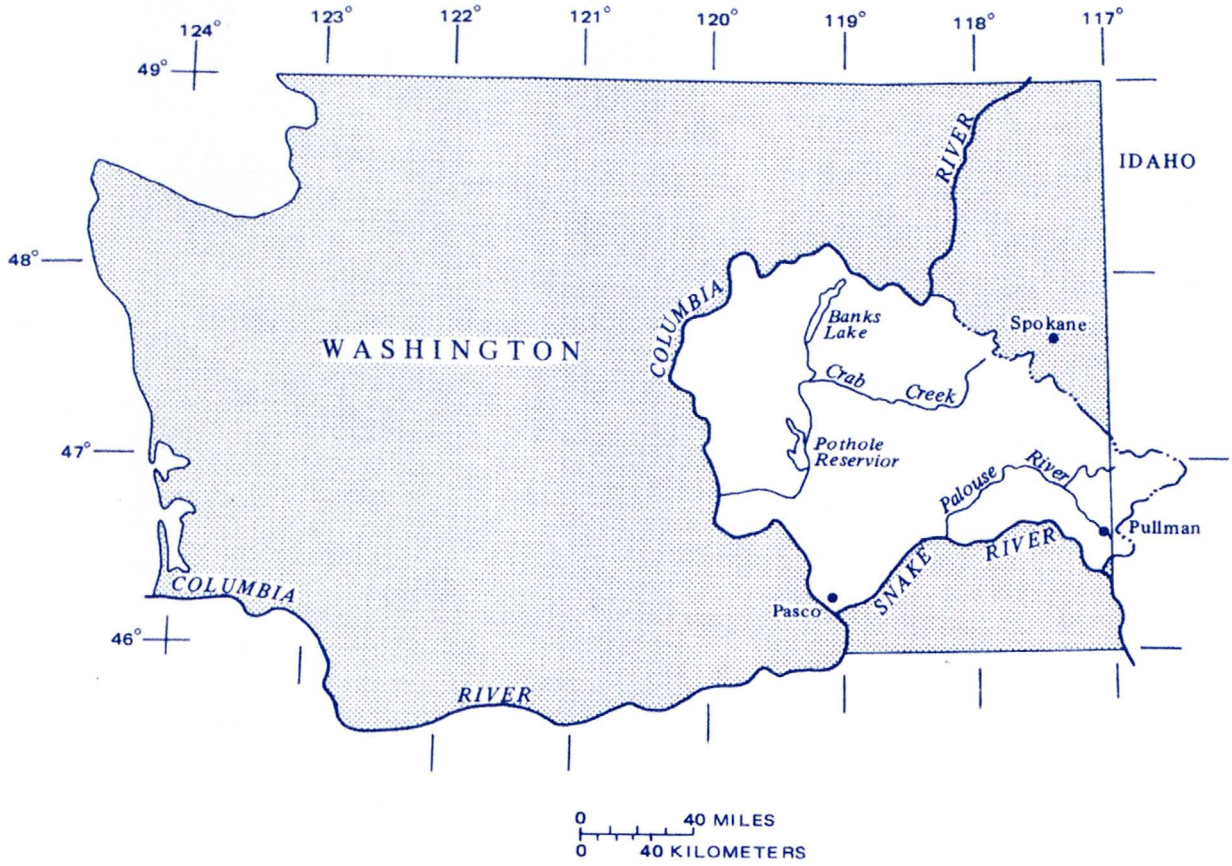
Water use (excluding that used only for hydropower) during 1985 totaled about 3,000 million gallons per day; about 80 percent was surface water used for irrigation. The primary surface source of irrigation water is the Columbia River. Irrigation with ground water accounted for about 14 percent of the total water used in 1985. Persistent declines of ground-water levels have occurred in parts of the basin, almost exclusively in areas of sizable pumping for irrigation. In other areas of the basin, water levels have risen because of recharge from the large quantities of surface water applied for irrigation.

The USGS has completed an extensive study of the regional aquifer system underlying the basin. The study described the geohydrology, geochemistry, and regional flow system of the major basalt formations and of the interflow zones. Geochemical factors controlling the occurrence of sodium in the ground water of the basin also were studied.

WATER-QUALITY ISSUES

The key water-quality and related issues in the irrigated western part of the mid-Columbia River basin are:

- Elevated concentrations of nutrients and trace organic compounds in surface and ground waters;
- Eutrophic conditions and obnoxious aquatic plants in some streams and lakes;
- Low flows and low dissolved-oxygen concentrations in surface water;
- Elevated temperatures and large concentrations of bacteria and suspended sediment in surface water;



- Elevated concentrations of sodium in surface and ground water in areas irrigated with ground water; and
- Waterlogged soils in areas irrigated with surface water.

The water quality and related issues in the eastern part of the basin used for dry-land farming and grazing include:

- Erosion of soil by rainfall and snowmelt, especially on frozen ground;
- Streambed deposition of fine sediment that covers fish-spawning gravels and depletes dissolved oxygen, a result of poor land-use practices;
- Low streamflows and ground-water level declines; and
- Elevated temperatures, pH, and concentrations of ammonia and bacteria in surface water, which also contributes to the deterioration of fish habitat.

COMMUNICATION AND COORDINATION

Communication and coordination between USGS personnel and other interested scientists and water-management organizations are critical components of the NAWQA program. Each of the study-unit investigations will have a local liaison committee that consists of representatives who have water-resources responsibilities from Federal, State, and local agencies, universities, and the private sector. Specific activities of each liaison committee will include the exchange of information about water-quality issues of regional and local interest; the identification of sources of data and information; assistance in the design and scope of project products; and the review of project planning documents and reports. The liaison committee for the mid-Columbia study unit will be formed in 1991.

Information on technical reports and hydrologic data related to the NAWQA program can be obtained from:

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