

**Groundwater Resources Program**

**Bibliography of Groundwater Resources of the  
Glacial-Aquifer Systems in Washington, Idaho, and  
Northwestern Montana, 1905–2011**

Open-File Report 2012–1053



# Bibliography of Groundwater Resources of the Glacial-Aquifer Systems in Washington, Idaho, and Northwestern Montana, 1905–2011

By Sue C. Kahle and Zoe O. Futornick

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# Bibliography of Groundwater Resources of the Glacial-Aquifer Systems in Washington, Idaho, and Northwestern Montana, 1905–2011

By Sue C. Kahle and Zoe O. Futornick

## Abstract

The U.S. Geological Survey Groundwater Resources Program is undertaking a series of regional groundwater availability studies to improve our understanding of groundwater availability in major aquifers across the Nation. One of the objectives of the Glacial Principal Aquifers study (proposed) is to provide information on the occurrence of groundwater in glacial aquifers in the United States, an area that includes parts of the northern continental States and much of Alaska. Toward this effort, a literature search was conducted to identify readily available documents that describe the occurrence of groundwater in glacial aquifers in the United States. This bibliography provides citations for documents, as well as codes indicating types of information available in each, for Washington, Idaho, and northwestern Montana—an area corresponding approximately to the southern extent of the Cordilleran ice sheet.

## Introduction

Groundwater is among the Nation's most important natural resources. Groundwater provides one-half of the Nation's drinking water and is essential to the vitality of agriculture and industry, as well as to the health of rivers, wetlands, and estuaries throughout the Nation. Large-scale development of groundwater resources with accompanying declines in groundwater levels and other effects of pumping has led to concerns about the future availability of groundwater to meet domestic, agricultural, industrial, and environmental needs. The U.S. Geological Survey (USGS) Groundwater Resources Program (GWRP) is undertaking a series of regional groundwater availability studies to improve our understanding of groundwater availability in major aquifers across the Nation.

Information on the glacial-aquifer systems in Washington, Idaho, and Montana is found in many reports and printed and computerized bibliographies and indexes. This report compiles this information into one document—an inclusive bibliography about groundwater resources of glacial-aquifer systems in Washington, Idaho, and northwestern Montana.

## Purpose and Scope

The purpose of this bibliography is to provide a list of published literature relating to groundwater resources of the glacial aquifer systems in Washington, Idaho, and northwestern Montana, corresponding to an area within or near the southern extent of the Cordilleran Ice Sheet within the continental United States (fig. 1).

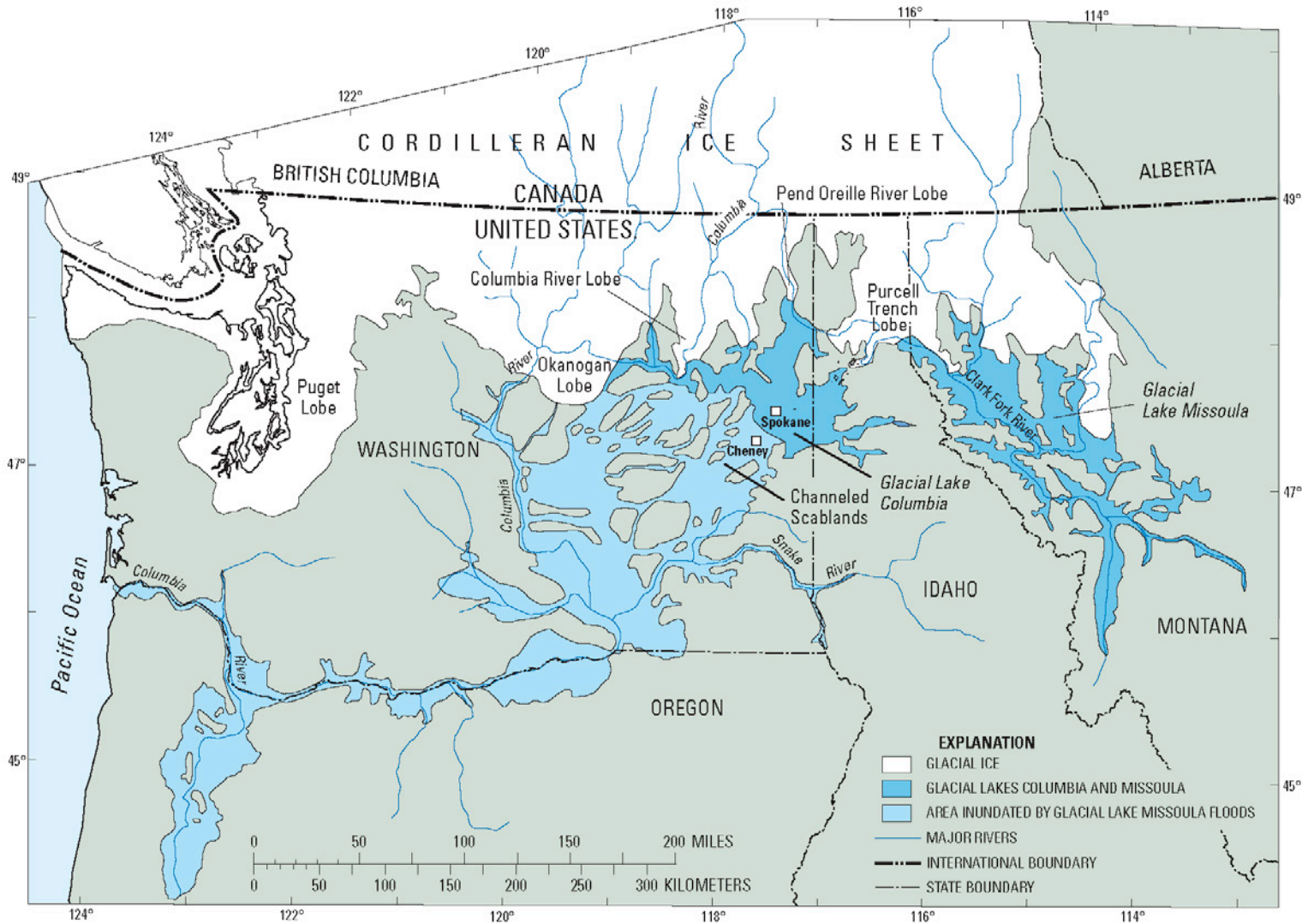


Figure 1. Extent of the Cordilleran Ice Sheet in Washington, Idaho, and northwestern Montana.



References contained in this bibliography date from 1905 through 2011. The focus of this bibliography is to include references that describe the physical nature of groundwater systems. In the interest of providing a manageable bibliography focused on groundwater systems, documents pertaining only to water chemistry, surface water, or geology generally were not included. The bibliography contains references to government and other technical reports, selected theses, maps, journal articles, books, and several fact sheets. Most documents in this bibliography are for regional areas of study. For some areas, small-scale studies are included if regional studies have not been conducted. Unpublished documents, publications in press, conference abstracts, and site-specific (small-scale) geotechnical reports generally are omitted from the bibliography.

## Approach

This bibliography was compiled from numerous USGS and State resources. In addition to author publications lists, various published atlases and bibliographies were used to identify documents to include in this bibliography including Briar and others (1996), Clark and Dutton (1996), Jones (1990), MacInnis and others (2009), Tuck and others (1996), and Whitehead (1994, 1996). Additional documents were identified in on-line publication lists and bibliographies hosted by the USGS Water Science Centers in Washington (<http://wa.water.usgs.gov/pubs/>), Idaho (<http://id.water.usgs.gov/publications/>), and Montana (<http://mt.water.usgs.gov/pub/Biblio.html>).

State resources include on-line bibliographies and publication lists hosted by the:

- Washington Department of Ecology (<http://www.ecy.wa.gov/biblio/groundwater.html> and [http://www.ecy.wa.gov/programs/eap/wsb/wsb\\_Geology-and-Groundwater.html](http://www.ecy.wa.gov/programs/eap/wsb/wsb_Geology-and-Groundwater.html));
- Washington Division of Geology and Earth Resources (<http://www.dnr.wa.gov/ResearchScience/Topics/GeologyPublicationsLibrary/Pages/washbib.aspx>), the Idaho Department of Water Resources, (<http://www.idwr.idaho.gov/WaterInformation/Publications/> and <http://www.idwr.idaho.gov/WaterInformation/Projects/svrp>),
- Idaho Geological Survey ([igs@uidaho.edu](mailto:igs@uidaho.edu)), and
- Montana Bureau of Mines and Geology (<http://www.mbmgs.mtech.edu/mbmgcat/catMain.asp>).

The bibliography is arranged by State and alphabetically by principal author (individual or organization): where more than one publication by the same author is listed, the references are in chronological order. A “Regional Studies” section includes references to reports that discuss the groundwater of broad regional or large, multistate areas such as the Spokane Valley–Rathdrum Prairie aquifer, which covers parts of Washington and Idaho.

To supplement the bibliography, each reference is assigned codes that identify principal types of information it contains (Wiltshire, and others, 1986). These codes, given at the end of each reference, are defined as:

- B Hydrologic budget of aquifers or aquifer systems, or components thereof, such as ‘recharge’
- C Water-chemistry data in tables and/or maps
- D Geologic and well data in tables and/or maps
- G Geologic description of aquifers (or hydrogeologic units)
- H Hydrologic description of groundwater systems
- K Hydraulic properties of geologic materials
- L Water-level data in tables and/or maps
- M Mathematical model of groundwater systems
- Q Analysis of groundwater-quality data
- R Reconnaissance appraisal of aquifers, usually presented as maps
- S Description of surface-water resources
- U Water-use data or summary of water use for a locality

Documents listed in **bold type** were not readily available for review at the time of publication (2012) and, therefore, do not have codes assigned indicating the type of information contained in the document.

## Bibliography of Groundwater Resources of the Glacial-Aquifer Systems

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Bartolino, J.R., 2007, Assessment of areal recharge to the Spokane Valley-Rathdrum Prairie aquifer, Spokane County, Washington, and Bonner and Kootenai Counties, Idaho: U.S. Geological Survey Scientific Investigations Report 2007-5038, 38 p. (Available at <a href="http://pubs.er.usgs.gov/publication/sir20075038">http://pubs.er.usgs.gov/publication/sir20075038</a> .)	B
Berenbrock, Charles, Bassick, M.D., Rogers, T.L., and Garcia, S.P., 1995, Depth to water, 1991, in the Rathdrum Prairie, Idaho; Spokane River valley, Washington; Moscow-Lewiston-Grangeville area, Idaho; and selected intermontane valleys, east-central Idaho: U.S. Geological Survey Water-Resources Investigations Report 94-4087, 2 sheets. (Available at <a href="http://pubs.er.usgs.gov/publication/wri944087">http://pubs.er.usgs.gov/publication/wri944087</a> .)	L

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## Washington

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