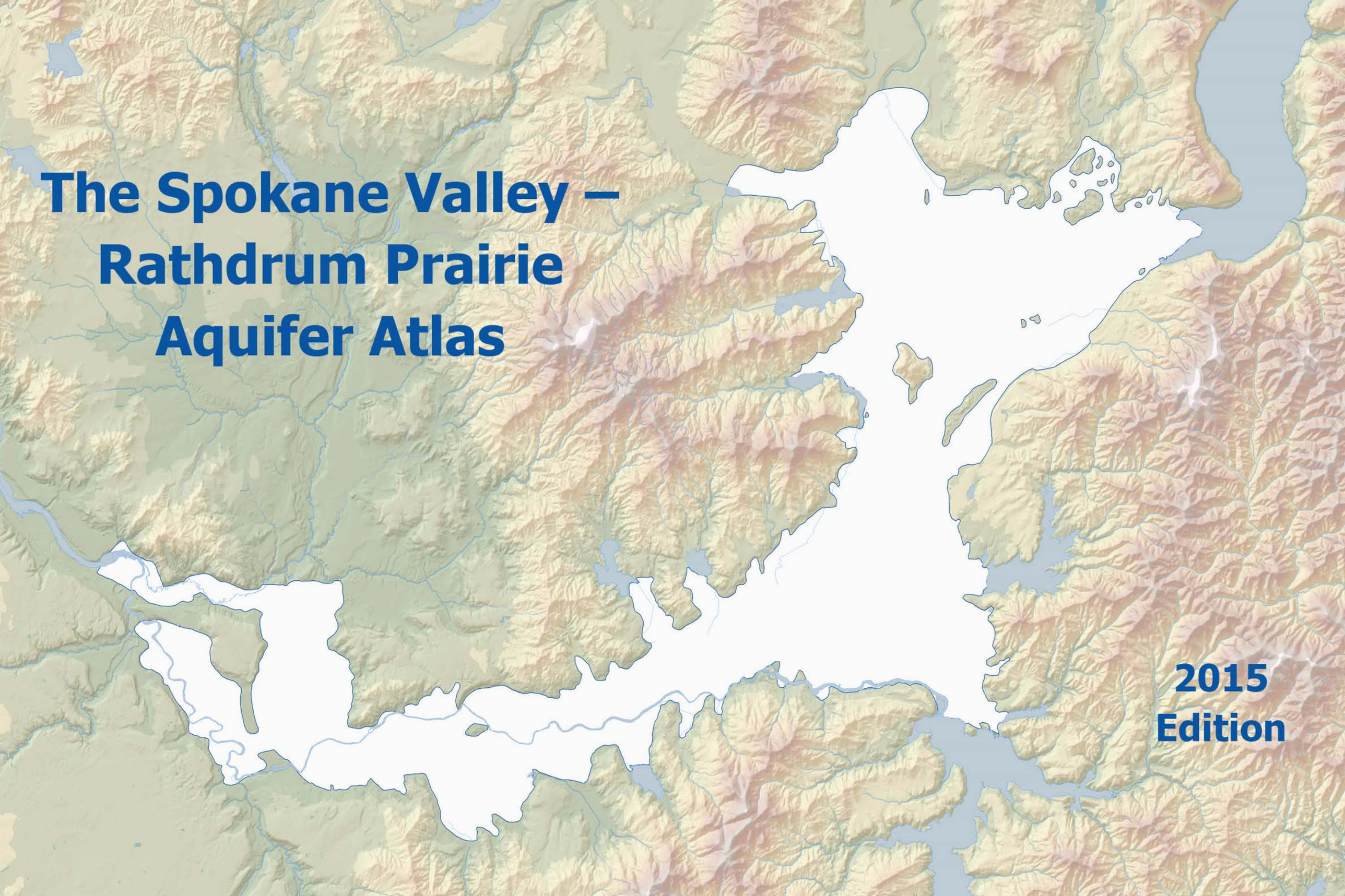
The Spokane Valley – Rathdrum Prairie Aquifer Atlas



2015 Edition

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Welcome!

Welcome to the 2015 edition of the Spokane Valley – Rathdrum Prairie (SVRP) Aquifer Atlas. The original SVRP Aquifer Atlas was published in 2000 and updates were issued in 2004 and 2009.

As in past versions of this atlas, the purpose is to present a comprehensive summary of the region's most precious groundwater resource. The intent is to provide a basic reference of the geographic, geologic, and hydrologic characteristics of this aquifer. It is intended for regional use in education, in planning, and as a source for general technical information.

The SVRP aquifer spans two states, Washington and Idaho. Natural resources that cross political boundaries are often subject to different and sometimes conflicting standards, protections, and uses. All SVRP Aquifer Atlas editions are a joint effort by agencies in both states to create a holistic representation of the SVRP aquifer as both a geologic feature and a natural resource used daily by more than half a million people.

Political boundaries and objects made by people are absent from the front cover map to show the aquifer as a natural feature. The SVRP aquifer area is not blue to differentiate the aquifer area from surface water bodies.

The authors' goal in this SVRP Aquifer Atlas edition is to include issues that are currently facing our region. Our hope is to educate the public, and through greater understanding of this precious resource, to become good stewards who will protect and preserve this finite aquifer.

SVRP Aquifer Extent

The boundary of the SVRP aquifer has been defined differently by various investigators over time. The 2000 and 2004 aquifer atlases used the aquifer boundary adopted by the Environmental Protection Agency (EPA) in 1978. The boundary used in this document is the aquifer extent described by the US Geologic Survey (USGS) in 2005 (Scientific investigations Report 2005-5227) that expanded portions of the aquifer boundary based on hydrogeologic information and also to facilitate computer modeling.

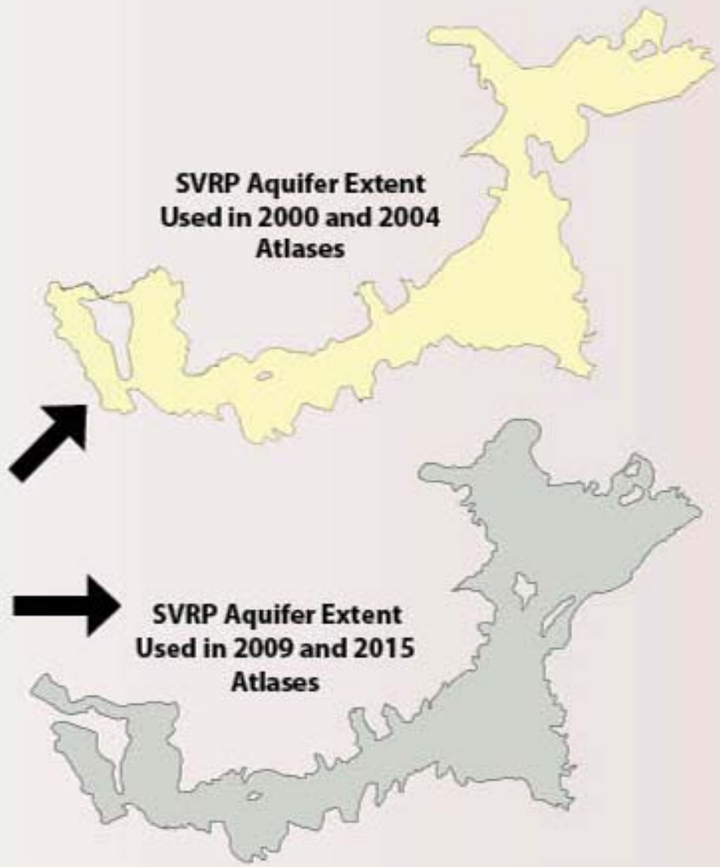
The aquifer extent defined by the USGS in 1978 or for the 2005 to 2007 studies does not represent the EPA's Sole Source Aquifer boundary defined for the SVRP aquifer. The boundaries presented in this atlas should be considered general in nature and are appropriate for the use and information available at the time of publication.

What's New In The 2015 Edition

This atlas starts with new colors for the cover map. Many of these colors are used through the entire atlas. The last page of the atlas has a link to a website with additional information on many of the topics covered in this atlas. The website also has a resource guide for educators and parents with many activities that use this SVRP Aquifer Atlas.

Many new issues face our region since the 2009 edition of the SVRP Aquifer Atlas. These issues have been the subject of media reports and the source of much public discussion. These issues include the amount of interaction between the Spokane River and the SVRP aquifer, stormwater and wastewater discharge to the river and minimum flow rates of the Spokane River in late summer and fall. These interactions have the ability to impact the water quantity and quality of the SVRP aquifer and the Spokane River. These issues have also raised public concerns related to the health of the fisheries and general aquaculture of the Spokane River.

It is not the authors' intent to describe or suggest potential solutions regarding the issues of the region in this publication but to provide a tool to educate the public allowing constructive and productive dialogue for future solutions.



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3/31/2015

Navigating The Atlas

The pages are organized into six theme categories with a unique color for each.

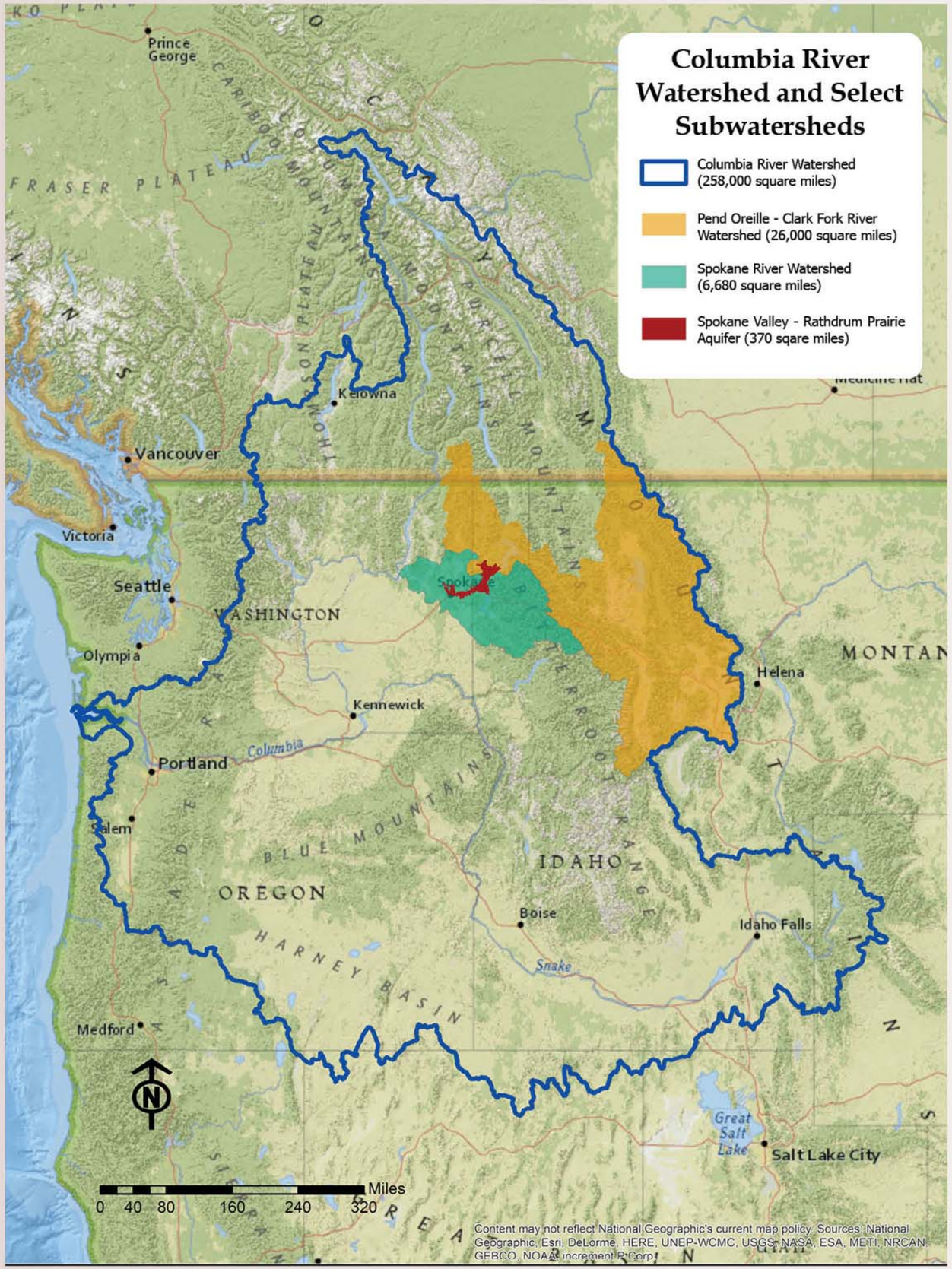
INTRODUCTION

The Water Beneath Us

The sole source of water for most people in Spokane County, Washington, and Kootenai County, Idaho, is a large deposit of gravel, cobbles, and boulders containing high-quality water called the Spokane Valley – Rathdrum Prairie (SVRP) aquifer, also commonly known as the "Rathdrum-Spokane aquifer." Discovered in 1895, this aquifer has become one of the most important resources in the region, supplying drinking water to more than 500,000 people. The SVRP aquifer has been studied in considerable detail since 1977, and the results of these investigations have produced programs and regulations designed to ensure this aquifer will remain a valued and protected resource for future generations.

The geology and hydrogeology of the Spokane Valley and Rathdrum Prairie have, over millions of years, been formed by various geologic events and shaped by water flowing from the western slopes of the Rocky Mountains to the Pacific Ocean. During the last Glacial Age (18,000 to 12,000 years ago), and possibly in multiple previous Ice Ages, cataclysmic floods inundated northern Idaho and Washington as a result of the rapid draining of Glacial Lake Missoula when ice dams broke (see pages 5 and 6). These floods deposited thick layers of gravels, cobbles, and boulders that form the aquifer of today. Water from adjacent lakes, mountain streams, the Spokane River, and precipitation flows through these flood deposits supplying the SVRP aquifer.

In the 1970s area residents recognized that their unconfined aquifer could easily become contaminated. The highly permeable flood deposits, together with very thin topsoil layers in many locations, make the SVRP aquifer highly susceptible to pollution. Area residents took the first important step to protect the SVRP aquifer by petitioning the US Environmental Protection Agency (EPA) to designate the SVRP aquifer as a "sole source aquifer". The EPA agreed and granted this designation in 1978. It was the second aquifer in the nation to receive this special designation. The sole source designation increased public awareness for SVRP aquifer and supported the development of special management practices (such as eliminating septic systems and pretreating stormwater over the SVRP aquifer) by local agencies. Presently, SVRP aquifer protection efforts are managed cooperatively by Spokane County, local cities, the Department of Ecology and utilities in Washington, and by the Department of Environmental Quality, Panhandle Health District, and local cities and counties in Idaho.



1895
Spokesman-Review

PUMP STATION DELAYS

Water in Excavation

The contract awarded to R. A. Jones in 1894 to construct the Upriver Dam is proceeding slowly. The pump station at the upriver dam has encountered water during excavation. Pumping 40 million gallons daily out of a hole 24 feet square for a considerable time at a cost of over eight thousand dollars has only lowered the water 2 feet.

Thursday, May 6, 1909
Spokesman-Review

SPOKANE'S WATER PUREST IN WORLD

City Bacteriologist Frank Rose Reports Results No Colon Bacilli Found

Showing the Spokane water supply purer than the average of American cities, Frank Rose, city bacteriologist, has made a report of tests from the city well made monthly since last October. The tests are simply counts of the number of bacteria found in a cubic centimeter of water.

The average count shows only seven or eight germs in that amount of water. The test was made from water taken from the drinking fountain at Howard street and Riverside avenue or from water from a faucet in the Rookery building. Speaking of his tests, Dr. Rose said:

"It can be said that there is no city in the world that has a better water supply than Spokane. Water which shows 100 germs in a cubic centimeter is considered comparatively pure and drinkable. I made from four to eight counts monthly since last October, and the counts in any one month was 17 bacteria, while the tests last month showed 15 bacteria in eight tests, less than two each.

GEOLOGY

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The geology of the Spokane Valley – Rathdrum Prairie area is the result of multiple geologic events that have occurred over hundreds of millions of years creating both our landscape and the aquifer of today. Understanding the geologic events of the past helps us better understand our environment and current issues. The geology of the area is complex and it has taken decades to piece the history together. Five significant geologic units compose most of the rock types found in the Spokane Valley – Rathdrum Prairie area . Brief descriptions of these units follow on the next pages. The color surrounding the description and abbreviation **match the color of the geologic units shown on the accompanying geologic map.**

1. Belt supergroup (Bsg) - 1.1 to 1.4 billion years ago

What Are They?

Belt Supergroup rocks are composed of a thick sequence of sediments that were deposited in an ancient sea basin. The term "Supergroup" refers to an extremely thick sequence of rocks of the same kind, and Belt refers to the name of the basin that the sediments were deposited within. The basin was formed by geologic forces pulling the rock apart and creating a large, deep rift. The sediment was deposited deep under water forming thick accumulations. As the rift filled with sediment, it was also slowly sinking; a process geologists call "subsidence". The subsidence allowed even more sediment to accumulate in the rift. Eventually the rift started to fill and younger sediments were deposited in shallower water. The sediment consisted mostly of clay and silts, along with sands and calcium carbonate. The basin's great depth allowed sediment that is tens of thousands of feet thick to accumulate. The weight of all the overlying sediment eventually caused the sediment to metamorphose or turn into a type of rock called an argillite.

Fossil ripple marks

Window To An Ancient World

The Belt rocks were probably deposited much like what we see today with silts and sands from nearby land washing out into a shallow basin of water. Some of the sediments have ripple marks from wave action, indicating the sediments were deposited near the shoreline.

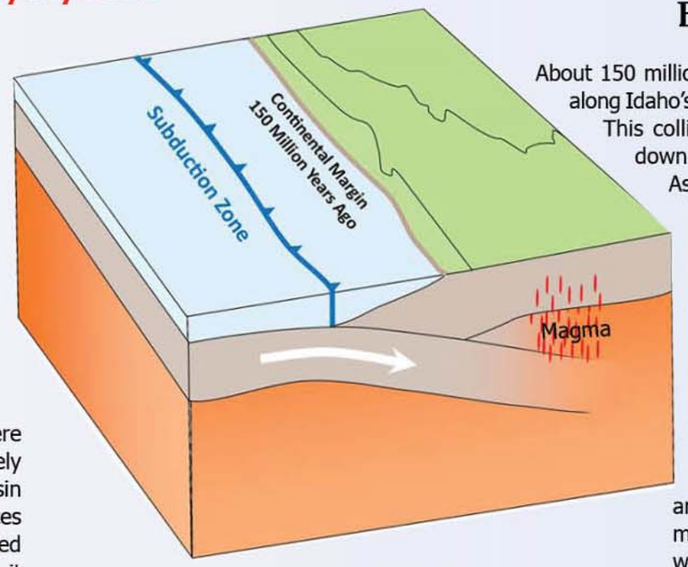
Living stromatolites in Australia

Fossils in the metamorphosed sediments of a type of blue-green algae are called stromatolites. Stromatolites are the oldest known fossils and formed layers or mats often shaped like domes. These fossilized domes are seen in some of the Belt Supergroup rocks. Stromatolites thrived in areas of warm shallow water and, like plants of today, needed sunlight and carbon dioxide to live. Stromatolites lived in large colonies, similar to current day coral reefs. Stromatolites currently exist in a few places in the world. They are found in small, isolated fresh-water lakes and shallow marine lagoons.

Fossil stromatolites

2. Kaniksu Batholith (Flir) - 50 to 100 millions years ago

Batholith Formation



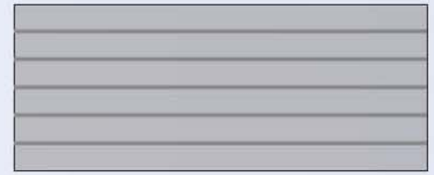
About 150 million years ago, the continental margin was located along Idaho's western border, where two tectonic plates collided. This collision resulted in the western plate being forced down (subducted) and overridden by the eastern plate. As the western plate was subducted, the rock began to heat up as it reached greater depths, melting portions of the upper plate. The drawing shows what happened.

The melted material (magma) was lighter than the surrounding rock and rose up from deep within the earth. Instead of forming a volcano, it solidified near the earth's surface. The solidified body of rock is called a batholith.

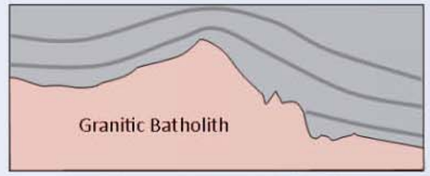
The Kaniksu Batholith is located in northern Idaho and northeastern Washington, and is the northern-most formation of Idaho's many batholiths, which were formed about 70 to 80 million years ago.

Batholith Exposure

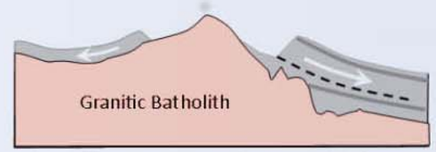
When the Kaniksu Batholith intruded upward, it forced the overlying Belt Supergroup rocks to the east and west. The Kaniksu Batholith split the Belt Supergroup rocks along the Purcell fault. In geology, a fault is where two rock bodies move past each other. Over time erosion of the overlying rock exposed the Kaniksu Batholith. The movement of the Belt Supergroup rocks to the east also formed a large trench between the two rock groups that eventually filled with gravels and sand forming the Rathdrum Prairie.



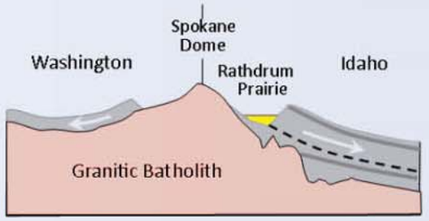
Deposition of Belt Supergroup



Intrusion of granitic batholith



Batholith emplacement displaces Belt Super-group rocks to east and west



Kaniksu Batholith Rocks

The upper crustal material is made up of many different types of minerals (rocks are made from one or more minerals) with different melting temperatures. Minerals with low melting temperatures melt first and separate from the larger rock mass. The minerals that melt first make up granitic-type rocks. Because it took millions of years for the magma to solidify back into rocks, it had time to form many different minerals as crystals that we can see when we look at the rocks.

Kaniksu rock on Mount Spokane

GEOLOGIC MAP

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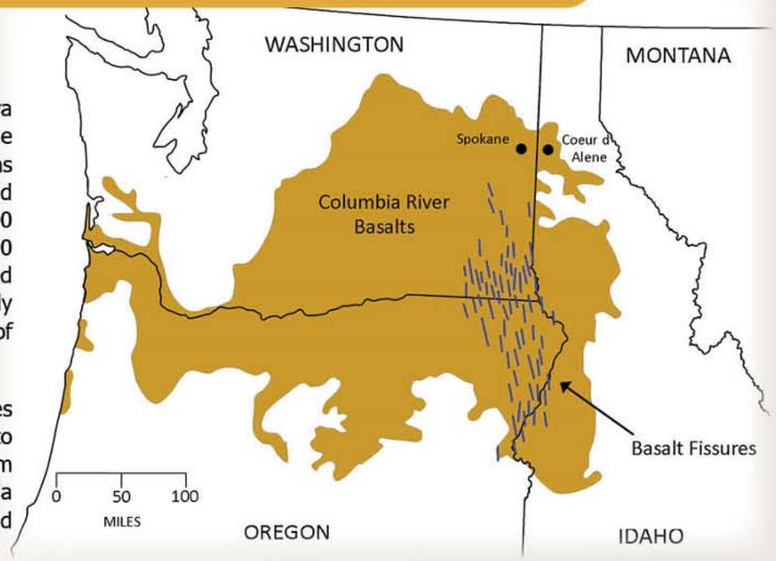
3/31/2015

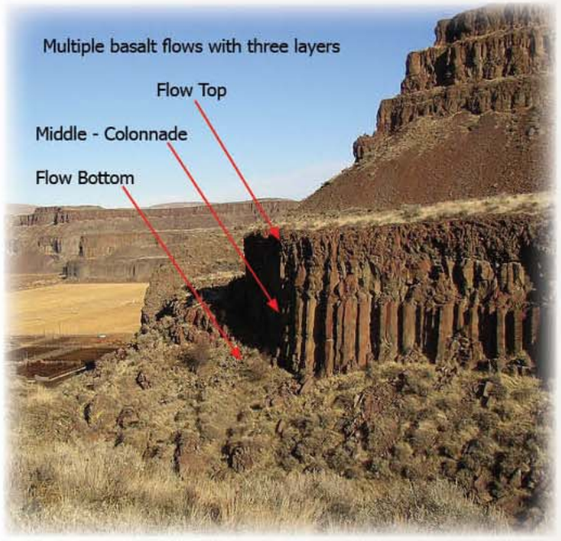
3. Columbia River Flood Basalts (Crb) - 10 to 17 million years ago

Lava Flows

About 10 to 17 million years ago, as many as 270 lava flows erupted from basalt fissures located near the Idaho, Oregon, and Washington borders. The eruptions did not form volcanos because the lava was very fluid and acted like floods. It is estimated that almost 42,000 cubic miles of lava flowed out over an area of 63,200 square miles. The individual lava flows were estimated to be about 150 feet high and moved at approximately 3 miles per hour. Sometimes there were hundreds of thousands of years between the lava flows.

In the central area of Washington near the Tri-Cities the cooled and hardened lava, called basalt, is up to 10,000 feet thick. The Spokane Valley – Rathdrum Prairie (SVRP) aquifer is at the edge of the Columbia River Flood Basalts and many of the mountains around the SVRP aquifer stick out above the basalts.





Three Basalt Forms From Each Lava Flow

The basalt has three appearances depending on where it was in the flow when it hardened: flow top, middle section, and flow bottom.

- The upper part of the basalt flow (flow top) cooled and hardened quickly in contact with the atmosphere so it developed many small air bubbles. Basalt with many small air bubbles is called vesicular basalt.
- The middle section of a basalt flow took a long time to cool and solidify. As the basalt cooled, it shrank and developed cracks. The cracks started near the top where it cooled first and then spread downward making long columns. Each individual basalt column is called a colonnade.
- The flow bottom was in contact with the top of the previous older basalt flow. Generally the top of the previous flow was exposed to the elements and weathered into soil and smaller bits of basalt. When the new lava flowed over the top of the older basalt, it picked up and incorporated large amounts of the rock debris. Basalt with bits of rock is called a breccia.

Each basalt flow covered the previous one and developed similar appearances. You can see all three basalt forms when the full height of the flow is exposed.

Latah Formation

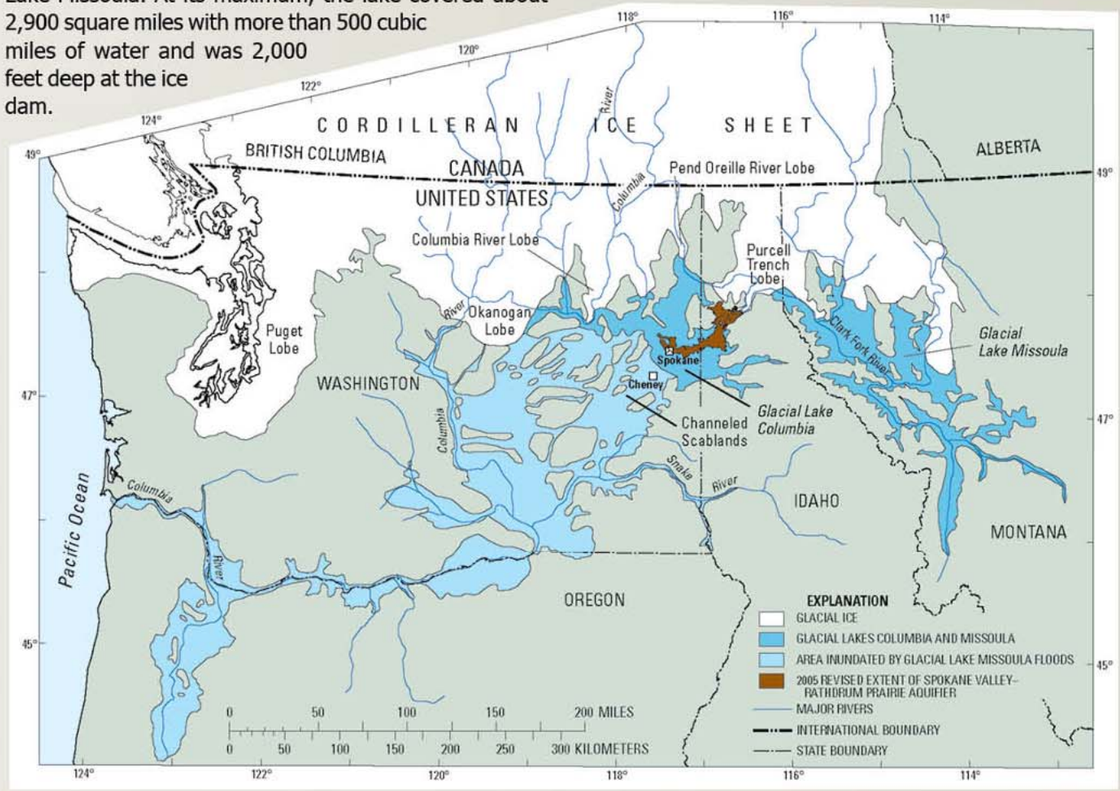
In northern Idaho and eastern Washington, the flood basalts filled the valleys, blocking streams and rivers creating ponds and lakes. These ponds and lakes filled with silt and fine-grained sediments that later formed siltstone and are called the Latah Formation. Many types of fossils including plants, mollusks, and fish can be found in these sediments.

Latah rocks with leaf fossils

4. Glacial Lake Missoula Flood Deposits (Fg) - 15 to 100 thousand years ago

The cooling climate during the Pleistocene Epoch, or Ice Age, caused sheets of ice to advance south several times from current day Canada. The uneven leading edges of the Cordilleran ice sheet are called lobes. There were two main lobes in the area. The Purcell Trench Lobe flowed far enough south to sometimes block the Clark Fork River and the Okanogan Lobe flowed far enough south to block the Columbia River.

The Purcell Trench lobe of ice reached south to completely cover the area of present day Lake Pend Oreille during the last glacial advance, 13,000 to 18,000 years ago. This glacier blocked the Clark Fork drainage forming Glacial Lake Missoula. At its maximum, the lake covered about 2,900 square miles with more than 500 cubic miles of water and was 2,000 feet deep at the ice dam.



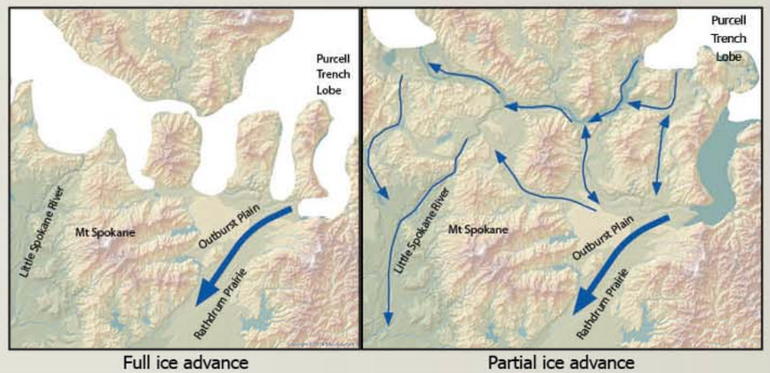
Exploding Ice

The water behind the ice dam exerted great force on the ice dam and forced its way into the ice. Eventually the ice dam failed and released a great volume of water all at once, creating enormous floods. Ice dams reformed and exploded at least 40 times. These types of glacial floods are called jokulhalups, an Icelandic term meaning "glacial run".

Different Paths

Sometimes the Purcell Trench Lobe extended to the southern end of Lake Pend Oreille. When the ice dam broke, the only path available to the floods was south over the Rathdrum Prairie. See the map at right.

When the Purcell Trench Lobe did not extend as far, the floods had several possible paths besides the Rathdrum Prairie. Some of the water flowed through routes that led to the Little Spokane River valley. See the map at far right.



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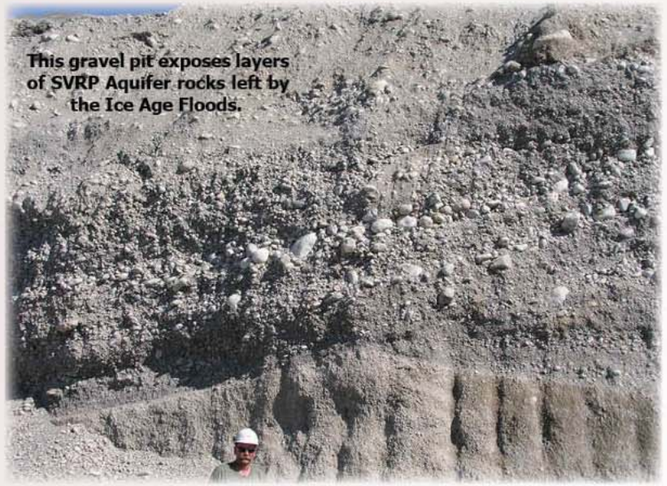

This gravel pit exposes layers of SVRP Aquifer rocks left by the Ice Age Floods.

How The Ice Age Floods Created The Spokane Valley – Rathdrum Prairie Aquifer

The water in the Spokane Valley -Rathdrum Prairie (SVRP) area during the floods reached depths of about 450 feet and flowed with peak velocities of 60 miles per hour. The flow rates may have reached one billion cubic feet per second—more than the flow of all the rivers in the world. Large amounts of ice, cobbles, sand, and gravel were carried along with the water. The larger gravel, cobbles, and boulders were deposited and the smaller silt and sand were carried away. These rocks are now part of the SVRP aquifer.

Glacial Lake Columbia covered the Rathdrum Prairie and Spokane Valley almost to the front of the ice dam during some of the floods. When the lake was present, it slowed down the water so some silt and sand were deposited along with the gravel, cobbles, and boulders.


Wave-cut strandlines near Perma, Montana record former high-water lines, or shorelines of Glacial Lake Missoula.

Repeated Ice Age Floods

After a flood event ended, the ice lobe slowly moved southward, blocking the Clark Fork River once again. Eventually, this dam would also fail, resulting in another flood. This repeated flooding deposited large amounts of mainly gravel and cobbles in the Spokane Valley – Rathdrum Prairie area and eventually blocked the tributary valleys, forming Lakes Coeur d'Alene, Hayden, Pend Oreille, Spirit, Twin, Hauser, Liberty and Newman.

Did you know ?

- The ice dam was over 2,000 feet tall.
- Glacial Lake Missoula was as big as Lake Erie and Lake Ontario combined.
- The floodwaters speed may have peaked at about 60 mph.

Ice Age Floods Beyond The SVRP Aquifer

The catastrophic floods from Lake Missoula rapidly flowed into Glacial Lake Columbia displacing enormous amounts of water forming geologic features called "coulees." Coulees are generally long with steep sides caused by the rapid erosion and down cutting from the large amounts of water flowing through them. The water that spilled out into the coulees to the west and over low points to the south flowed in enormous sheets across central Washington. The large amounts of water deformed the landscape giving the area the name "scablands."


An ice rafted erratic in a coulee.

Large pieces of ice with boulders floated many miles in the flood. The boulders were deposited as the ice melted leaving behind unusual rocks called "erratics".

The flood water finally spilled into the present day Columbia River Gorge and on to the Pacific Ocean.

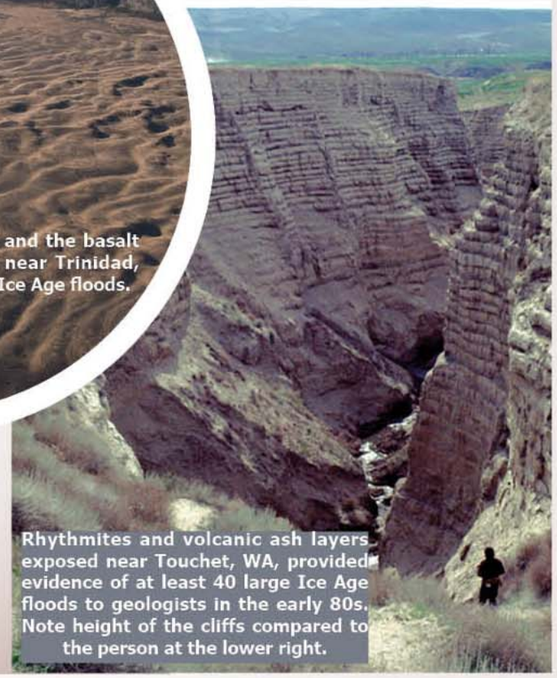
Evidence For The Ice Age Floods

The evidence for Glacial Lake Missoula comes from shoreline features called wave-cut strandlines on many hillsides in Montana.

Giant ripples marks on Camas Prairie in Montana and on the West Bar in Washington as well as large coulees are evidence of large amounts of water flowing rapidly.

Sediment layers with large rocks on the bottom and clay on the top, called rhythmites, found in many places along the flood's path are the evidence for repeated Ice Age floods. Some rhythmites are found along the lower part of Hangman Creek. The exposed rhythmites near Touchet, Washington, have at least 40 layers.


The West Bar with ripple marks and the basalt cliffs along the Columbia River near Trinidad, Washington are evidence of the Ice Age floods.


Rhythmites and volcanic ash layers exposed near Touchet, WA, provided evidence of at least 40 large Ice Age floods to geologists in the early 80s. Note height of the cliffs compared to the person at the lower right.

GEOLOGISTS UNRAVEL THE MYSTERY OF THE ICE AGE FLOODS AND GLACIAL LAKE MISSOULA

J Harlen Bretz (1881-1981) was a University of Chicago professor who studied the channelled scablands of eastern Washington. His 1923 theory proposed the scablands resulted from a catastrophic ice age glacial flood, an idea that was not accepted until the 1950s because he did not know the source of the flood.

Joseph T. Pardee (1871-1960) was a US Geological Survey geologist who theorized the wave-cut strandlines above Missoula and other features in western Montana came from a large lake that emptied rapidly. In 1940 he reported the lake emptied to the west and was the source of Bretz's catastrophic flood.

5. Unconsolidated Deposits (Ucd) - Present to 1.6 million years ago

These deposits represent all unconsolidated deposits that have been accumulated through wind, water, or as a result of landslides. These include the Palouse wind blown-sediments that extend from the Central Washington to the Pullman-Moscow area north to some of the upland areas surrounding Spokane. About a million years ago a warm dry climate existed and significant winds from the southwest carried silt from the central Washington area. The source of the fine silt was the fine material that flowed with older catastrophic floods and settled in what is now the channeled scablands. These wind blown silts are also called "loess" deposits, derived from the German word for loose.

SVRP AQUIFER TIMELINE


Spokane River, 1885


Overview of Fort Sherman, ID, 1890


Irrigation System, Post Falls, ID, 1900


Post Falls Lumber Co. sawmill, pre-1902


Modern Irrigation & Land Co, 3,000 gpm, 1908


Vera looking northeast, 1933

Ancient story of the lakes and aquifer of the Coeur d'Alene Tribe
Boy Travels Underground - as told by Felix Aripa, Coeur d'Alene Tribe

There was a boy who lived towards Hayden Lake area. The boy loved fishing. The boy loved to walk around. He went to the forests; he went to the mountains. There he saw his friends. There were a lot of animals that lived there. There were animals that fly; there was duck, bald eagle, owl, bee, magpie. Also there were the ones that live in the forest: elk, deer, bear, squirrel. There were the fierce animals: cougar, bear. And the ones that live in the river: frog, trout. A lot live on the prairie: rabbit, spider, prairie chicken, coyote.

One day the boy went fishing. He had a canoe. And he paddled across the water at Hayden Lake. And the weather changed. It began to get windy. The sky became gray.

And the boy approached an eddy. He started spinning, and he went down. He dove in. He arrived at a cave. He was all wet. And the boy was really tired. He laid down. He went to sleep.

[He woke up.] He walked a long ways kind of in a confusion (of where he was at). And the boy walked for three days.

And he heard something loud. There was a waterfall! And then the boy looked through it. He saw animals; there were his friends. They were happy. There was duck, bald eagle, owl, bee, cougar, bear, frog, rabbit, spider, chicken, squirrel, coyote, trout, ...

And the boy ran. He leaped through the waterfall. There was a splash! He dove in the river! And he swam. He crossed the water. He got really tired. He laid down on the shore. And he slept.

And he awoke. He was at q'emlin (Post Falls). That is the end of the road.

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3/31/2015

1923 J. Harlan Bretz presented his theory on the formation of the channeled scablands by a catastrophic flood.

1938 A survey of all major Washington rivers and waterways found the Spokane River the foulest water body in the state.

1830 1840 1850 1860 1870 1880 1890 1900 1910 1920 1930 1940

Since time immemorial, ancestors of the Coeur d'Alene and Spokane Tribes have lived in the lands surrounding the aquifer. The watershed provided them with bounteous fish, game, and plants that were, and are, an integral part of the tribal communities for millennia.

1860 James Madison Alden paints "Plante's Crossing" while official artist of the Northwestern Boundary Survey.

1894 Aquifer accidently discovered by City of Spokane contractor during Upriver Dam construction.

1899 Spokane Valley Irrigation District formed and Corbin ditch canal irrigation started.

1905 Modern Irrigation and Land Company, the first of many, formed to provide SVRP aquifer water to Spokane Valley farmers.

1908 The SVRP aquifer replaces the Spokane River as the City of Spokane's primary source of drinking water.

1931 Washington Water Power Company (Avista) prepares the first comprehensive study of groundwater in the Spokane Valley and Rathdrum Prairie.

1940 Joseph T. Pardee, a USGS geologist, proposes that an Ice Age glacial lake (Lake Missoula) drained rapidly creating Bretz's catastrophic floods.

Background picture is a watercolor by James Madison Alden of the Spokane Valley in 1860.

SVRP AQUIFER TIMELINE

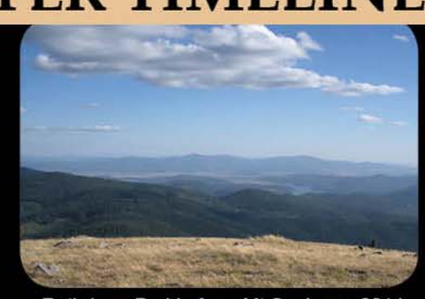

Rathdrum Prairie, ca 1952


Expo '74, Spokane, 1974


Stateline, 2005


Rathdrum Prairie, 2008


Post Falls north channel dam, 2008


Rathdrum Prairie from Mt Spokane, 2014

1952 USGS publishes an updated inventory of SVRP aquifer wells in the Spokane Valley.

1977 Local "208" studies are completed, and the sources of aquifer pollution are identified.

1978 EPA designates the SVRP aquifer as a "sole source aquifer" under Section 1424(e) of the Safe Drinking Water Act.

1988 USGS publishes Molenaar's Aquifer Report, the first modern SVRP aquifer study.

1998 The City of Spokane and the Spokane Aquifer Joint Board publish a wellhead protection plan.

The plan is updated in 2007.

2013 Idaho Washington Aquifer Collaborative forms to maintain and/or enhance the aquifer quality and quantity.

1977 Panhandle Health District implements the rule that limits domestic septic systems to one per 5 acres.

1981 Spokane County adopts a wastewater manangement plan to eliminate septic systems over the SVRP aquifer.

1988 U.S. Congress provides aquifer protection funding through the EPA.

2009 Avista's Post Falls and other Spokane River dams relicensed.

2008 Idaho begins water rights adjudication of the Rathdrum Prairie aquifer.

1972 Federal Clean Water Act provides authority and funding for SVRP aquifer protection planning efforts.

1950 1955 1960 1965 1970 1975 1980 1985 1990 1995 2000 2005 2010 2015

1973 Liberty Lake Sewer and Water District created to protect the lake and aquifer.

1974 EXPO '74 opens in Spokane with the theme: "Celebrating Tomorrow's Fresh New Environment."

1976 Local citizens and environmental groups petition the EPA to designate the aquifer as a "sole source aquifer".

1980 Spokane County and Panhandle Health District initiate a groundwater monitoring program for the SVRP aquifer.

1985 Spokane County authorizes the aquifer protection area for 20 years in a public vote.

1990 Panhandle Health District begins requiring secondary containment of critical materials.

1997 DEQ designates Aquifer as a "sensitive resource aquifer" in the Idaho state Ground Water Quality Rule.

2004 Spokane County reauthorizes the Aquifer Protection Area.

2014 Washington Department of Ecology proposes instream flow rule for the Spokane River.

2007 The results of a 4 year USGS bi-state aquifer study and monitoring program are presented to the public.

1951 USGS publishes an inventory of SVRP aquifer wells in Bonner and Kootenai Counties.

1976 Army Corp. of Engineers publishes the 14 volume Spokane Region Water Resources Study.

1980 DEQ designates the SVRP aquifer as a "special resource water" in Idaho, the highest level of state protection.

1995 DEQ adopts guidelines for land-applying wastewater over the SVRP aquifer in Idaho.

2007 Kootenai County residents vote to form and fund an Aquifer Protection District to fund SVRP aquifer protection programs.

Background picture is the 2004 view from Arbor Crest with the same view as the watercolor on the previous page.

DRAFT
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HISTORY OF WATER USE

Apples Trees, 1908

Family picking cucumbers, 1908


Spokane Valley Fruit Growers Warehouse, 1914


Water melons, Spokane Valley


Squash, Spokane Valley


Rathdrum Prairie, ca 1952

How The Valley Turned from Rocks To Green

Low rainfall and rocky soil made agriculture difficult above the Spokane Valley – Rathdrum Prairie (SVRP) aquifer. In 1895, irrigation canals bringing water from Newman and Liberty Lakes allowed agriculture to surge. The Modern Electric Water Company was formed in 1905 to provide irrigation water by using electricity to pump water from the newly discovered SVRP aquifer. The company set up a test plot, planted with every likely crop —and a few unlikely ones such as cotton and peanuts—and soon settled on the crop deemed most profitable: apples. The newly irrigated fields of Spokane Valley were planted with acre after acre of apple trees. New railroads provided a way to get the apples to many markets so the demand was high. By 1922, there were more than 1.6 million apple trees in the Spokane Valley. The main road from Spokane to Coeur d'Alene was named the Apple Way (or Appleway) because it was lined with apple trees for mile after mile.

The early 1920s proved to be the peak apple-growing years. Apples were a risky venture, far from the surefire cash crop predicted by that test plot. By about 1925, farmers were beginning to yank out their orchards because of a combination of problems: disease, insect infestations, low prices, untimely freezes, and competition from the Wenatchee and Yakima valleys, where the climate and nearby rivers for irrigation were perfectly suited for apple growing. In 1926, about 200,000 apple trees were pulled out, and by 1945, only about 50,000 apple trees remained.

Truck farms growing melons, berries, and vegetables replaced apple orchards. The Heart of Gold cantaloupe became a valley specialty. Today, the major crops above the SVRP aquifer are grain, hay, pasture, and mint. Most of the large-scale agriculture occurs on the Rathdrum Prairie. Many smaller farms are operated part-time to produce food for families and their animals, or are rural home sites.

What The Water Grew:

- Apples (8 different varieties)
- Cantaloupes (Heart of Gold variety)
- Watermelon
- Berries
  - ◇ Cherries
  - ◇ Strawberries
  - ◇ Raspberries
- Truck Farming
  - ◇ Tomatoes
  - ◇ Beans
  - ◇ Peas
  - ◇ Asparagus
  - ◇ Squash
  - ◇ Cucumbers
  - ◇ Corn

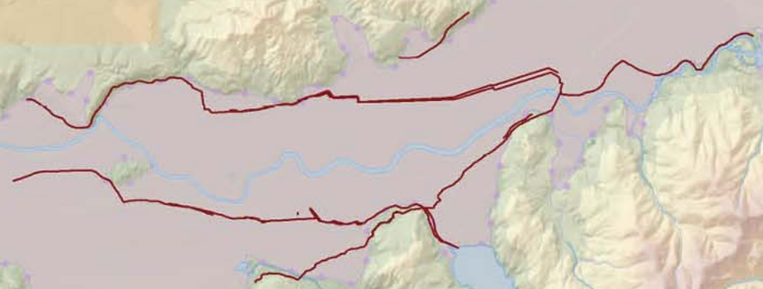
The End Of Large-Scale Fruit And Vegetable Agriculture:

Spokane Valley's shift from agriculture to development

Between 1920 and 1955, the farmers on the SVRP aquifer came to understand the climate. On the eastern edge of the plains next to the mountains, the weather consists of infrequent but intense cold snaps (as much as -25º F), multiyear droughts, and extremely wet times interspersed with periods of ideal growing conditions. The climate was much too variable to be relied on for long-term success in large-scale growing of fruits and vegetables. When a bad cold snap hit in 1955, the remaining large-scale apple orchards on the SVRP aquifer were decimated and the area never returned as a major player in the Washington apple trade.

Railroads, street car lines, and automobiles encouraged the growing population of the area to travel along the major roads including Appleway. Businesses sprung up to serve the travelers and people began to spread out. Orchard Avenue, an early land development in the Spokane Valley, began breaking up the farmland into ½ to 1 acre land tracts in 1909. The development included a water system, park, school, general store, and post office.

Nearby timber fueled the early manufacturing of matches and paper. Gravel mining and cement making were also important industries. Cheap electricity from the Grand Coulee Dam in the 1940s encouraged manufacturing to replace even more agriculture. All these industries brought people to the area; then the 1950s population boom led to housing, which replaced even more agriculture in the Spokane Valley. Today most commercial agriculture in the Spokane Valley occurs in greenhouses.



Legend

Canals

Water Sources

Lakes

Spokane River

Wells

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