

Unraveling the Myth of Abundance



*A Teachers' Guide to
The Okanagan Basin
Waterscape Poster*



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Introduction

The Okanagan Basin Waterscape poster is one of a series of educational posters developed by the Geological Survey of Canada to encourage the wise use of water in a part of the province that is facing what some have called a water crisis. As more and more people move into the Okanagan, and as the effects of climate change become increasingly apparent, concerns about maintaining a clean, safe and abundant supply of water will only increase. The Okanagan Basin Waterscape poster is intended to focus attention on these issues and to motivate residents to protect and conserve this valuable resource for future generations.

Bill Taylor, Okanagan Poster Committee

Unravelling the Myth of Abundance, Teachers' Guide to the Okanagan Basin Waterscape Poster is based on Calgary's Bow River Valley Basin Waterscape guide.

The Okanagan Basin poster was produced by a committee of regional scientists and educators. To assist teachers and students in the use of this poster, several regional educators contributed to the writing of this teachers' guide which was compiled, edited and designed by Central Okanagan Science Opportunities for Kids Society (SOKS). SOKS has been designing and presenting experiential science programs for teachers and students in elementary and middle schools for ten years.

To facilitate the use of the poster, which contains a series of topics or "panels" containing detailed illustrations and text, this guide is divided into four key concepts about water: Understanding Watersheds, The Okanagan Water Cycle, Wise Water Use and Protection of Aquatic Resources. Each key concept includes activities for a group of poster panels.

"The Okanagan Basin, including Osoyoos Lake has the least water per capita of all Canadian basins (Statistics Canada) and consistently [Okanagan River] ranks at or near the top in lists of Canada's most threatened rivers."

International Joint Commission on Water (IJC) Osoyoos Lake Water Science Forum Draft Proposal



photo: Benjamin Rondel



photo: Don Weixl, Tourism Kelowna



photo: Don Weixl, Tourism Kelowna

How to use this Guide

Unravelling the Myth of Abundance, is a companion guide for the Okanagan Waterscape Poster. This poster contains illustrations and text on thirteen different topics or panels (see following page).



This guide is recommended for and focuses on the BC curriculum for grades four to eight. Appendix: Grade 11 and 12 Activities, contains four activities designed by a Senior Secondary science teacher for grades 11 and 12.

To assist teachers to use the poster, this guide incorporates the panels with additional information and related activities. As a way of organizing the extensive information on the poster, the guide is divided into four key concepts which are presented in modules. Though the modules are presented in a specific order, teachers may choose to access one or all of the modules in any order they choose. The four key concepts are:

Key Concept 1: Understanding Watersheds

Key Concept 2: The Okanagan Water Cycle

Key Concept 3: Wise Use of Water

Key Concept 4: Protection of Aquatic Resources.

Each key concept links three or more panels on the poster and includes a series of related activities. Activities are included for upper intermediate elementary grades (4-6), middle school grades (7-8) and a few for grade 12 geology (in appendices). These activities focus on creating models, games and experiences that engage students in understanding issues around water in the Okanagan Valley and what they can do about dispelling the myth of its abundance. Though materials for the activity models need to be collected, costs are minimal.

An overview of the Key Concepts and related activities is provided on the following two pages.

Appendix: Maps and illustrations contains all the maps and many illustrations found in the body of the guide for duplication. Five are vector illustrations which can be enlarged without loss of resolution.

Ways to Use the Guide

1. Teachers can download and copy pages from the guide as needed. School district resource centres can expand the size in colour where this is desirable.
2. Each panel is reproduced in the guide and may be copied for easy reference.
3. Individual pages may be copied for group problem solving or games.
4. Icons like this one are provided throughout the guide for quick reference to the poster.



Key Concepts, Matching Poster Panels and Activities

Elementary and Middle Schools

Key Concept One : Understanding Watersheds

The Okanagan Watershed or Basin includes all the land within and the water surrounding the streams and lakes that ultimately drain into the six main lakes and the Okanagan River at the south end of the basin. Many small feeder lakes, wetlands and creeks in the hills contribute to the water in the six main lakes.

Panels

Water—The Myth of Abundance
What is the Okanagan Basin?
From Highlands to Valley Floor

Activities

School Yard Model
Contours: Shapes and Curves
Watershed Sculpture

Panels and Activities for Key Concept Two ~ Water Cycle

The Okanagan Basin Water Cycle is complex and influenced by a variety of factors. Our water supply is limited despite the visual cues that indicate otherwise. The amount of useable water within the watershed is limited by accessibility, hydrology and the seasonal timing of the water cycle process.

Panels

Okanagan Water Cycle
Our Lakes: Looks Can be Deceiving
Groundwater Connected to Surface Water
Our Challenging Climate: Less Water But Rising Demands

Activities

What is the Water Cycle?
Water Cycle in a Bottle
Water Cycle Keeps on Rolling
Dance of the Water Droplet
Measuring Rain with a Raincatcher
Building a Ground Water Model
Watershed Down
Go With the Flow
Effects of Human Use on the Water Table
Tasty Water
Ground Water Pollution and Prevention
Climate Change: Effects on Your Lifestyle
Aquifer Xray
Alkalai Lake

Key Concepts, Matching Poster Panels and Activities

Elementary and Middle Schools

Panels and Activities for Key Concept Three ~ Protecting Our Aquatic Resources

Protection and conservation (stewardship) of Aquatic Ecosystems is essential to sustain plant, animal and human communities into the future. We need healthy streams and groundwater.

Panels

Protecting Nature's Water Needs

Activities

Yellow Fish Road
Make a Waterscope
Stream Science

Panels and Activities for Key Concept Four ~ Wise Water Use

Wise water use for the Okanagan embraces water conservation at home and in our agricultural practices.

Panels

Sharing Our Waters
Wise Water Use Indoors
Wise Water Use Outdoors
Irrigation: Watering Our Land

Activities

Taste Test Challenge
Better than Bottled
How Water From the Watershed is Treated
Wise Water - Doing it Right
Greening the Lawn
Paradise or Paved
Okanagan Enviro-Ethics



What is the Okanagan Basin?

A river basin is an area of land where all the water that falls on it runs into the same river. The Okanagan Basin covers all the land that drains into the Okanagan River. It covers 15,000 km² (5,800 sq mi) and stretches from the Canadian border to the United States. The Okanagan River flows into the Kootenai River, which then flows into the Columbia River and finally into the Pacific Ocean.

Where does the Okanagan water go?

From highlands to valley floor

The highlands
The Okanagan valley is a great example of how the highlands and the valley floor are connected. The highlands are the source of the water that flows into the valley. They are the source of the water that flows into the Okanagan River, which then flows into the Kootenai River and finally into the Columbia River and the Pacific Ocean.

The valley is a busy place!
The Okanagan Basin is a very busy place. It is home to many people, cities, and towns. It is also home to many industries, including agriculture, forestry, and tourism. The Okanagan River is a vital part of the basin's ecosystem and provides water for many people and industries.

Okanagan's water cycle

Dry or really, really dry?
The Okanagan Basin is a very dry place. It receives very little precipitation compared to other parts of British Columbia. This means that the water that flows into the basin is very precious and must be managed carefully.

Our upland snow catchers
The highlands of the Okanagan Basin are important for the basin's water cycle. They catch the snow that falls in the winter and melt it in the spring, providing a steady flow of water into the basin.

We lose most of what we get
Only 10% of the water that falls in the Okanagan Basin is available for use. The rest is lost to evaporation or runs off into the ocean.

Our lakes: looks can be deceiving

Water shortages? Look at all that water!
The Okanagan Basin has many lakes, but they are not always what they seem. Some lakes are very shallow and dry up in the summer. Others are very deep and full of water, but they are not always available for use.

Be careful! We might "lose" the lake.
The Okanagan Basin is a very dry place, and the lakes are very precious. We must be careful to protect them and make sure they are available for future generations.

Poorly flushed lakes
Many of the lakes in the Okanagan Basin are poorly flushed, meaning that the water in them does not move around very much. This can lead to problems with water quality and the health of the lakes.

A "bank account" view of our lakes
The lakes in the Okanagan Basin are like a bank account. We must manage them carefully to make sure we have enough water for the future.

Groundwater: connected to surface water!

What is groundwater?
Groundwater is water that is stored underground in the soil and rocks. It is connected to the surface water in the Okanagan River and the lakes.

Groundwater feeds streams and lakes
Groundwater is a very important part of the Okanagan Basin's water cycle. It feeds the streams and lakes and provides a steady flow of water.

Disappearing streams
Many of the streams in the Okanagan Basin are disappearing. This is because the groundwater is being used up faster than it is being replenished.

Water is vulnerable
The water in the Okanagan Basin is very vulnerable. It is easy to pollute and it is hard to protect.

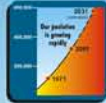
Our changing climate: less water but rising demands

The Okanagan Basin is experiencing a changing climate. There is less snow in the winter and more heat in the summer. This means that there is less water available in the spring and more demand for water in the summer.

Okanagan Basin Waterscape

Water - the myth of abundance

Okanagan is our home, a very special place. The Okanagan has been home to First Nations people for thousands of years, and to many others over the last century and a half. Water has always been Okanagan's most valuable resource for both humans and nature. Today, our economy, agriculture, home use, and recreation continue to share these waters with nature.



We live in a dry landscape. The large lakes make water look abundant, but nature's yearly re-supply is small. As our population is growing rapidly, so is our demand for water. Climate is changing and future water supplies are uncertain. Will there be enough water for our children and grandchildren? To meet the needs of humans and nature, we will have to rethink our water use, and value it more highly.

Sharing our waters

There are many ways we depend on water. There are many ways we share it. We share it with the people who live in the Okanagan Basin, with the people who live in the United States, and with the people who live in the Pacific Northwest.



Wise water use indoors

Now we use less water!
We can save water by using it wisely indoors. We can fix leaks, use water-saving devices, and be mindful of how much water we use.

Why do we use so much water?
We use so much water because we have so many things that use water. We have cars, houses, and businesses that all use a lot of water.

Did you know?
A single toilet flush can use 6 gallons of water. A single shower can use 25 gallons of water. A single load of laundry can use 40 gallons of water.

Wise water use outdoors

Doing it right
We can save water by using it wisely outdoors. We can water plants in the morning or evening, use mulch, and avoid watering lawns too often.

City runoff - Doing it wrong
City runoff is a problem because it carries pollutants into the water. We can reduce runoff by using permeable surfaces and planting trees.

Urban myth
Many believe that there is a lot of water in the Okanagan Basin. In reality, there is very little water available for use.

We need healthy streams and groundwater

Managing our land for healthy streams
We need to manage our land in a way that protects the streams and groundwater. We need to avoid building in floodplains and to plant trees along the banks of the streams.

Protecting our groundwater
Groundwater is a very important part of the Okanagan Basin's water cycle. We need to protect it by avoiding pollution and by using it wisely.

Irrigation: watering our land for food

Agriculture is BIG in the valley!
Agriculture is a very important part of the Okanagan Basin's economy. It provides food for people and jobs for many people.

Learning to conserve
We can save water by using it wisely in agriculture. We can use drip irrigation, mulch, and avoid watering too often.

Today
Today, we are using more water in agriculture than ever before. This is because of the growing population and the changing climate.

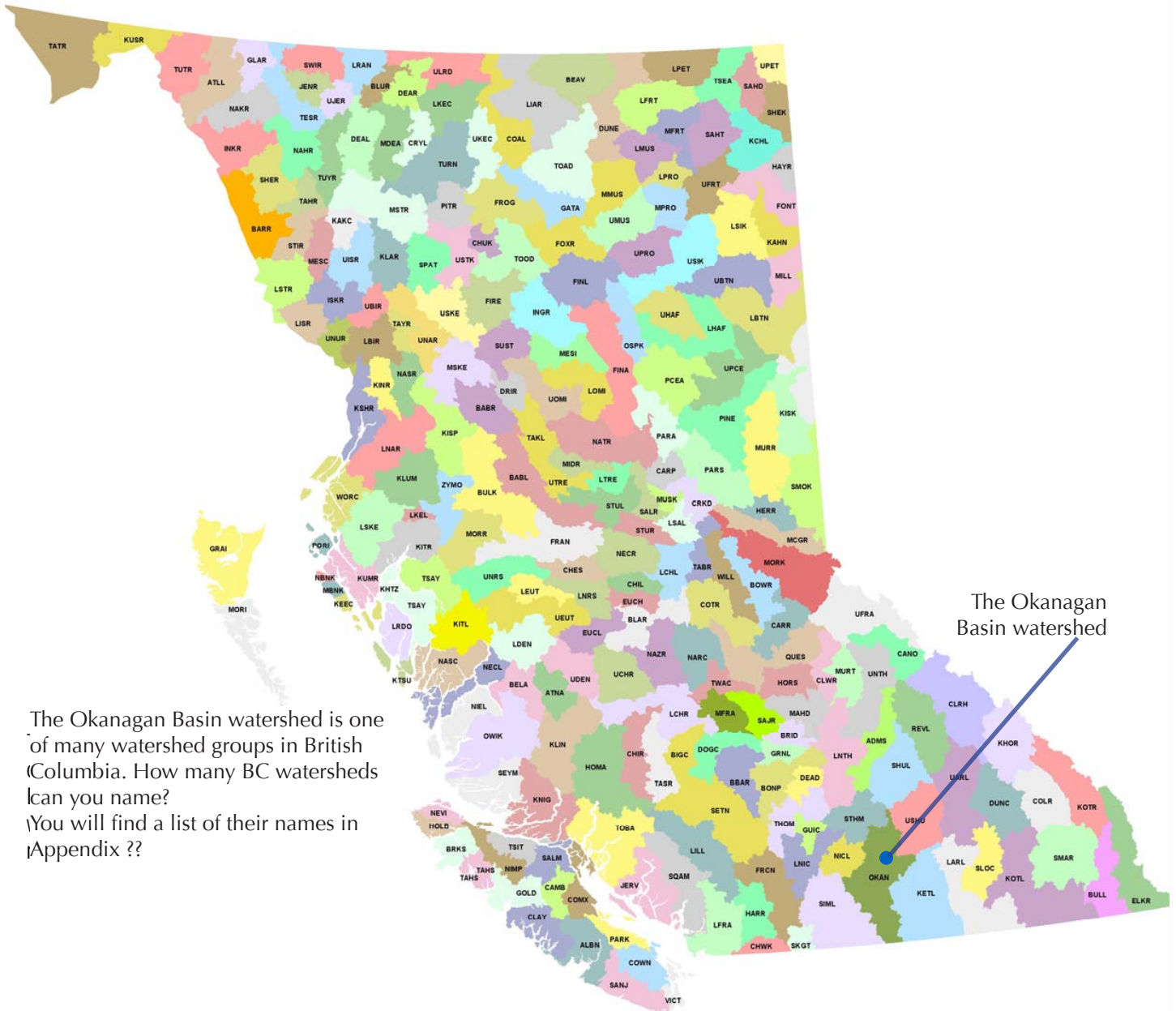
Protecting nature's water needs

Nature needs water to survive. We need to protect the water that is available to nature by avoiding pollution and by using it wisely.

Want to know more?

The Okanagan Basin Water Board is the organization that manages the water in the Okanagan Basin. You can find more information on their website at www.okanaganwaterboard.ca.

Watershed Groups in BC



The Okanagan Basin watershed is one of many watershed groups in British Columbia. How many BC watersheds can you name?
You will find a list of their names in Appendix ??

Prepared by GIS Applications Unit Information Services Branch BC Ministry of the Environment

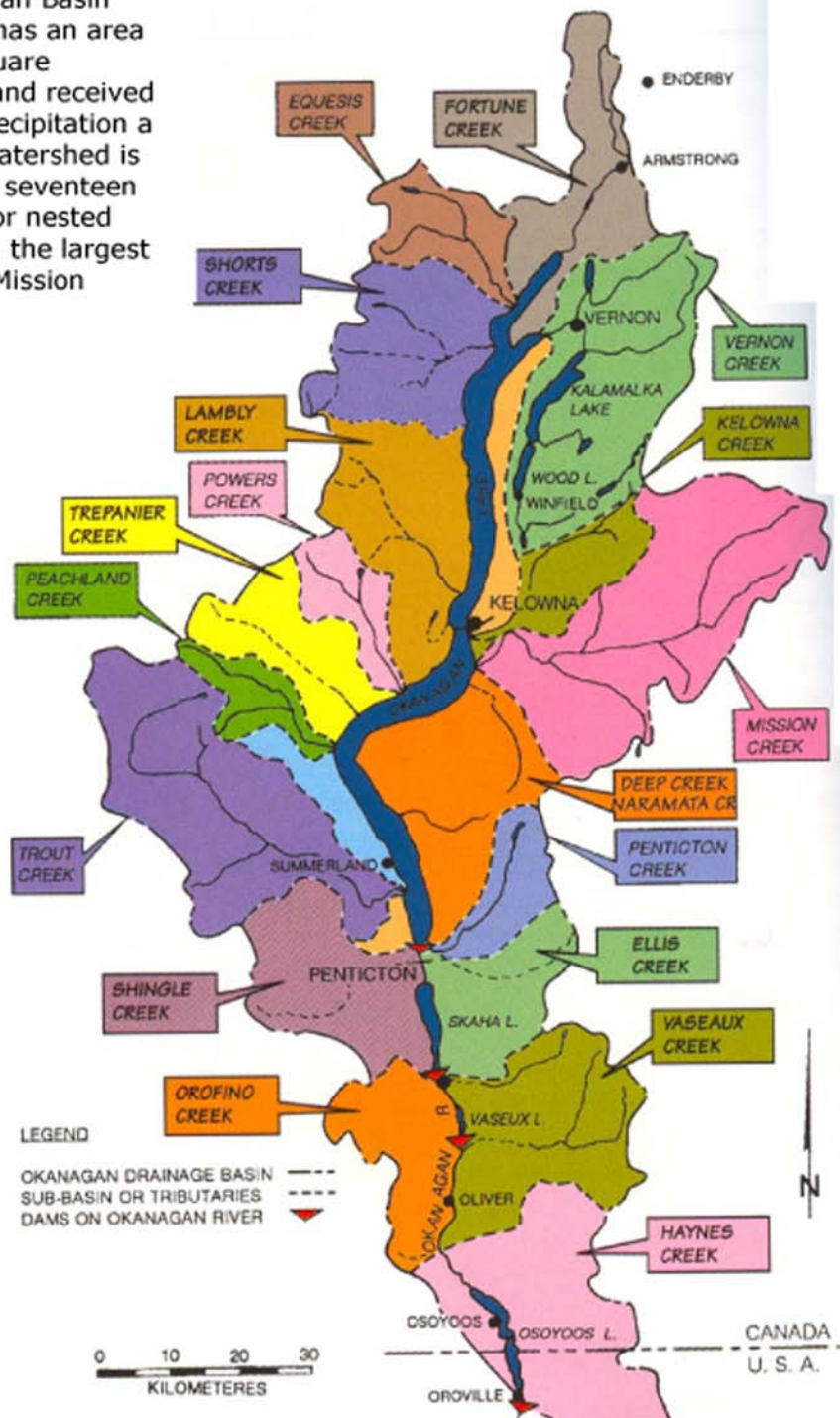
Okanagan Basin Watershed



Source: Okanagan Basin Waterscape; Geological Survey of Canada, Miscellaneous Report 93.

Okanagan Basin Watershed Groups

The Okanagan Basin Watershed has an area of 6,187 square kilometers and received 55 cm of precipitation a year. The watershed is divided into seventeen sub basins or nested watersheds, the largest of which is Mission Creek.



Source: *Okanagan Geology*. Kelowna Geology Committee editors. Murray Roed and John Greenough, 1995