



REGIONAL  
DISTRICT  
OF NANAIMO

# Freshwater Connections

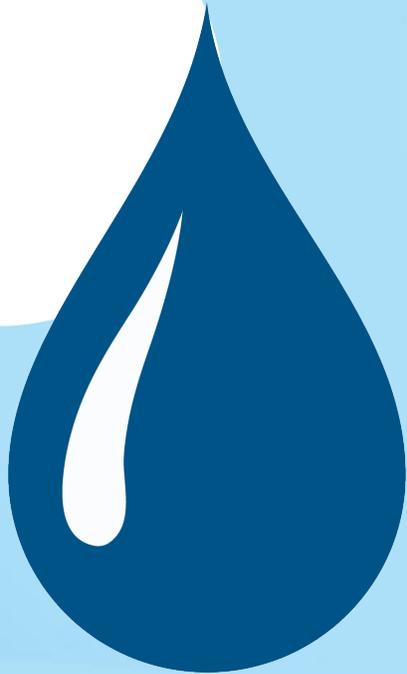


W A T E R   W H E R E   W E   L I V E

Part

1

Importance  
of **WATER**



# LAND ACKNOWLEDGEMENT

*Let us respectfully acknowledge that the lands and waters where we live are within the traditional territories of the Coast Salish First Peoples.*

A decorative graphic at the bottom of the page consisting of several overlapping, wavy bands of blue in various shades, ranging from light sky blue to deep navy blue, creating a sense of movement and depth.

# Xeel's the Creator

told by Sgutzulenuhw



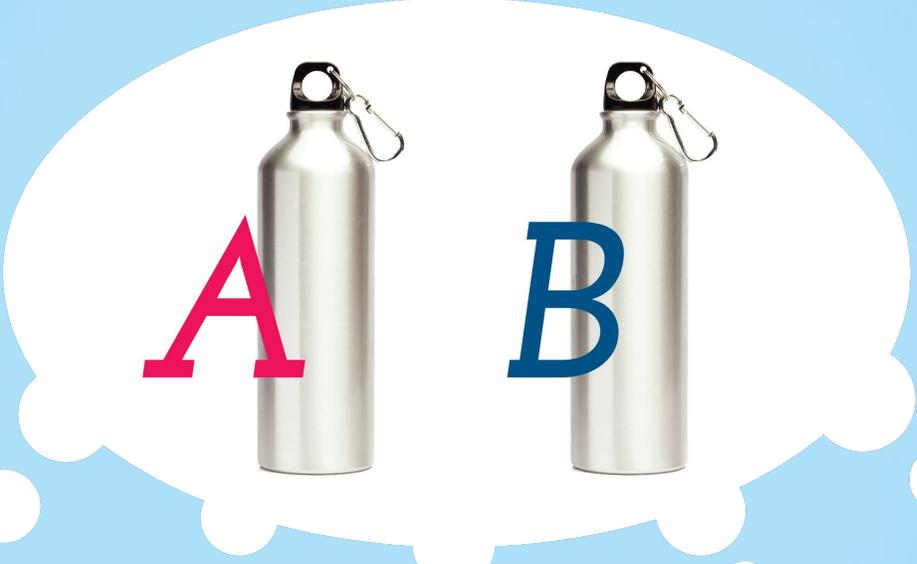
# LIVING NEAR WATER

Humans built communities near rivers, lakes and other waterways. Of course we need water to drink, but what other benefits do we get from living near water?





# WATER SCIENTISTS



# LIVING BY THE OCEAN

Many communities are by the ocean.  
What do they do for freshwater?



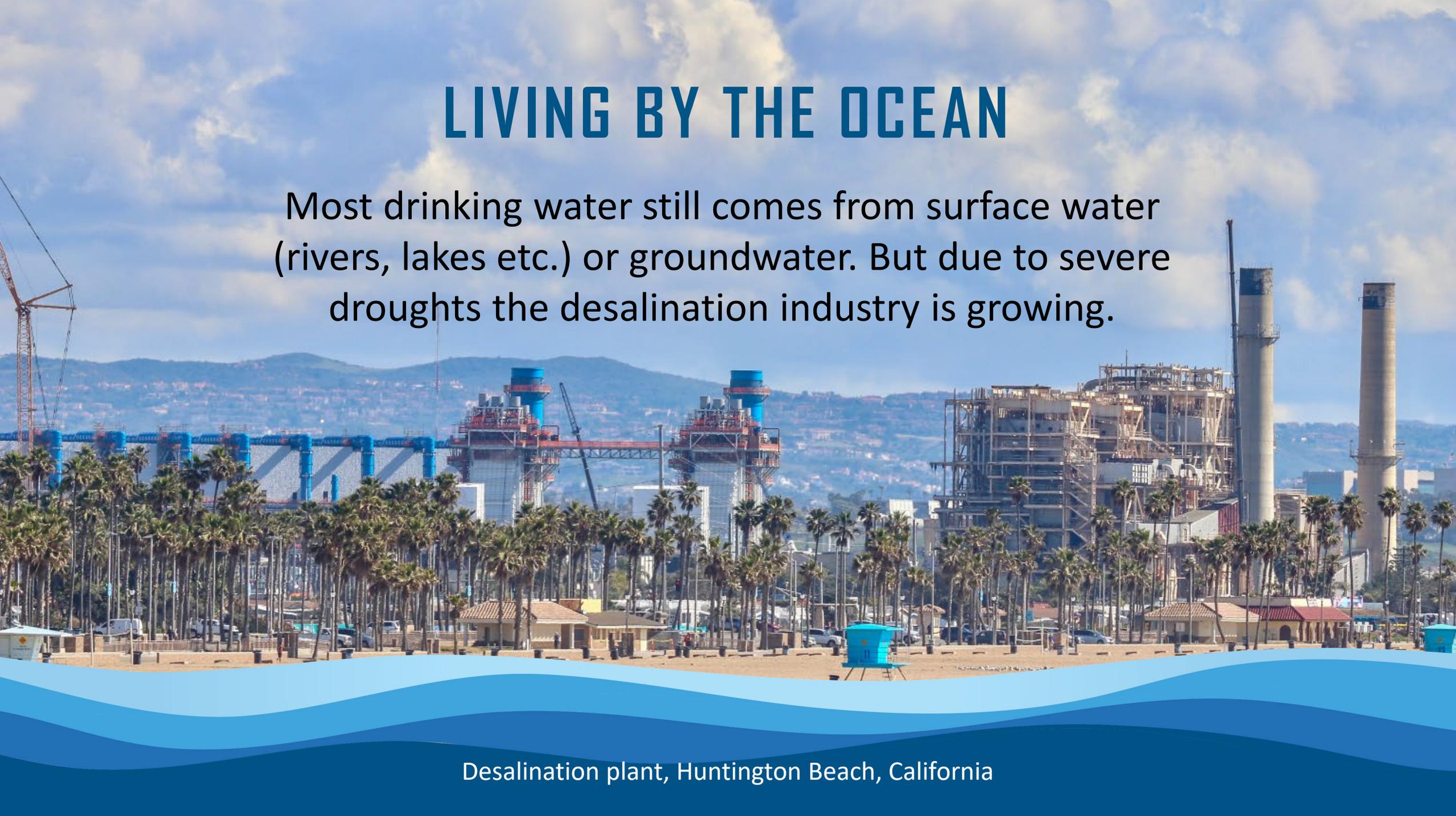
# LIVING BY THE OCEAN

What sources of drinking water  
are there in California?



# LIVING BY THE OCEAN

Most drinking water still comes from surface water (rivers, lakes etc.) or groundwater. But due to severe droughts the desalination industry is growing.



Desalination plant, Huntington Beach, California

# DESALINATION

## Advantages

- Proven effective way to get freshwater
- Backed by science
- Provides a needed source of drinking water

## Disadvantages

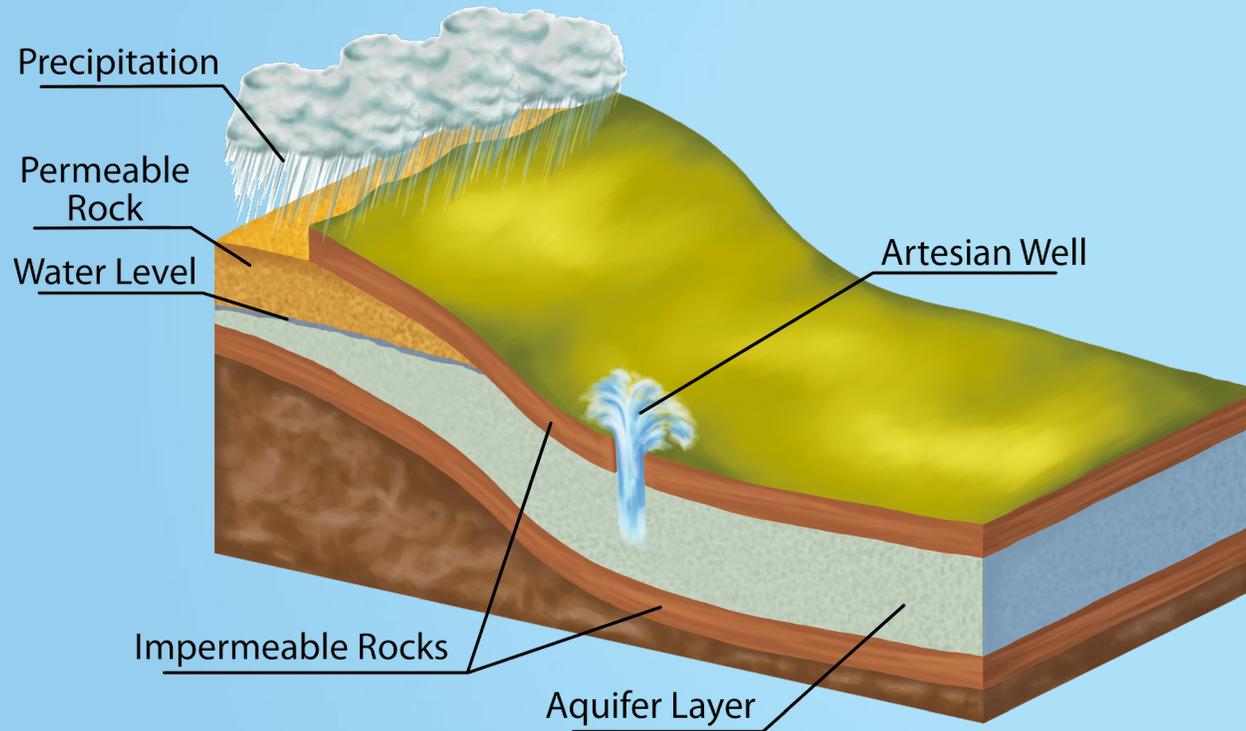
- Plants are expensive to build and costly to operate
- Uses lots of energy, often fossil fuels
- Salt removed can affect environment negatively



# LIVING BY THE OCEAN

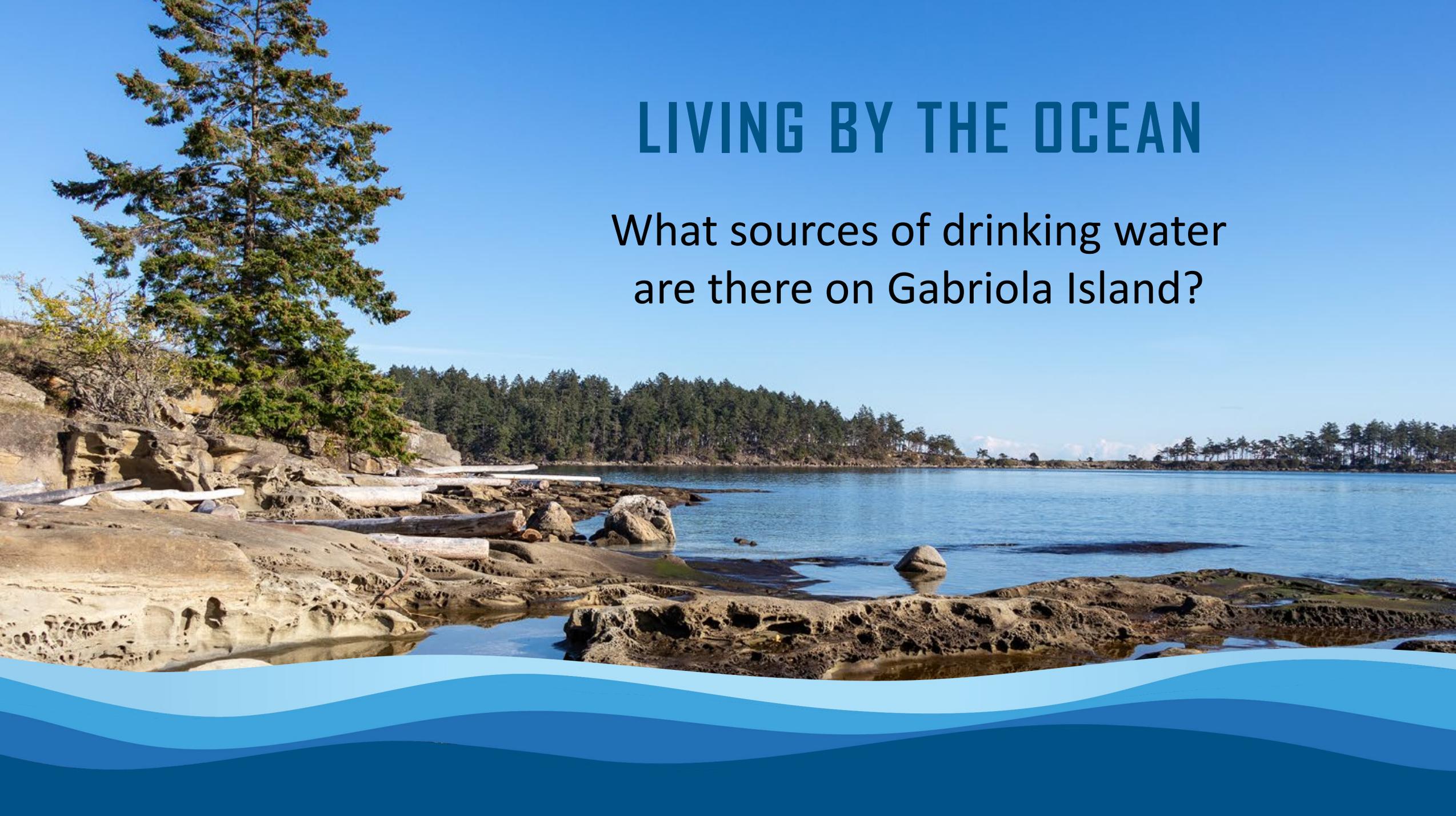
What sources of drinking water are there on Vancouver Island?

# LIVING BY THE OCEAN



Vancouver Island drinking water comes from surface water (rivers, lakes etc.) or groundwater.

Groundwater is accessed from aquifers.



# LIVING BY THE OCEAN

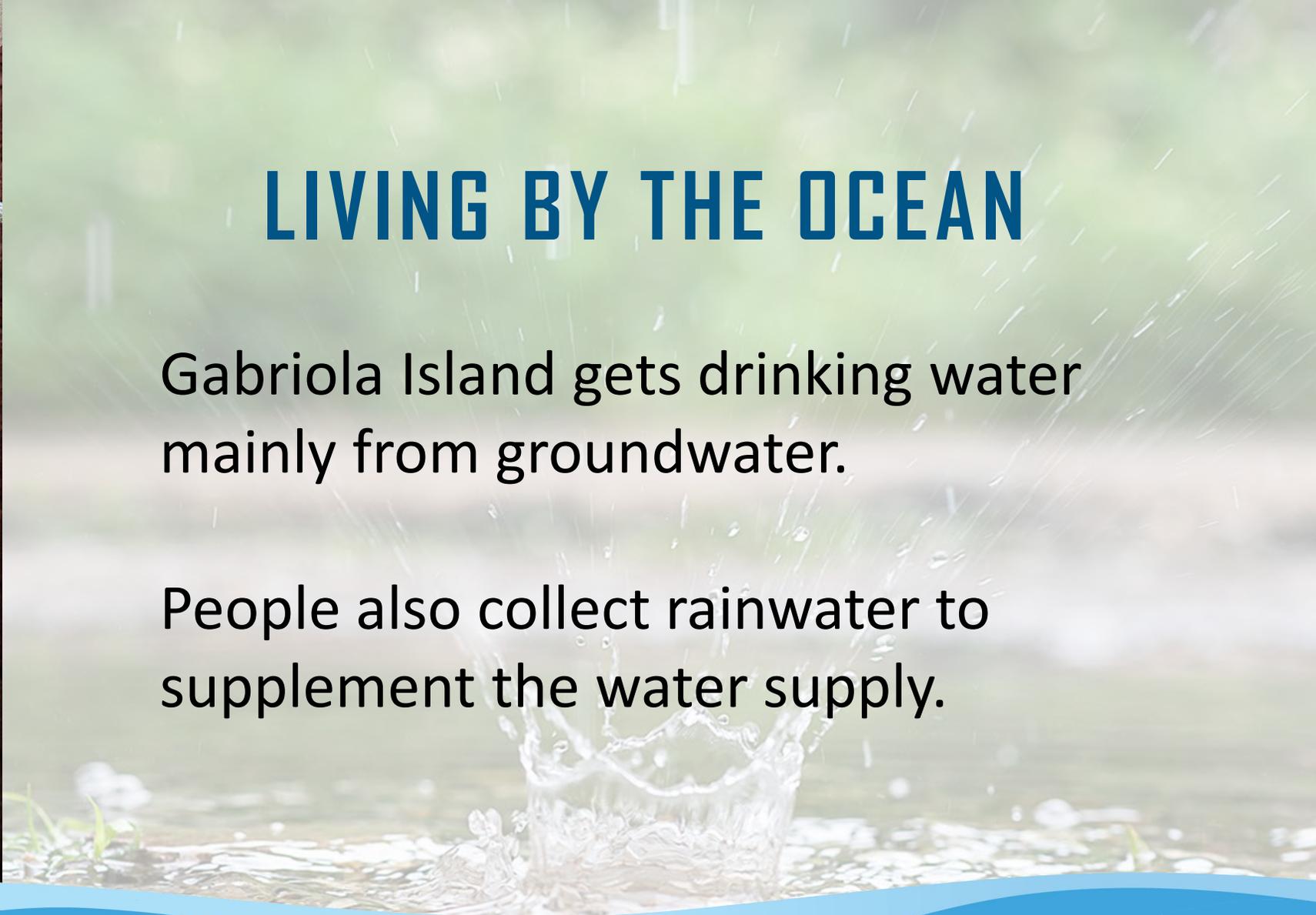
What sources of drinking water are there on Gabriola Island?



# LIVING BY THE OCEAN

Gabriola Island gets drinking water mainly from groundwater.

People also collect rainwater to supplement the water supply.



# WATER TRIVIA



# How much of the water on earth is fresh?



- A** 2.5%
- B** 10%
- C** 35%
- D** 50%

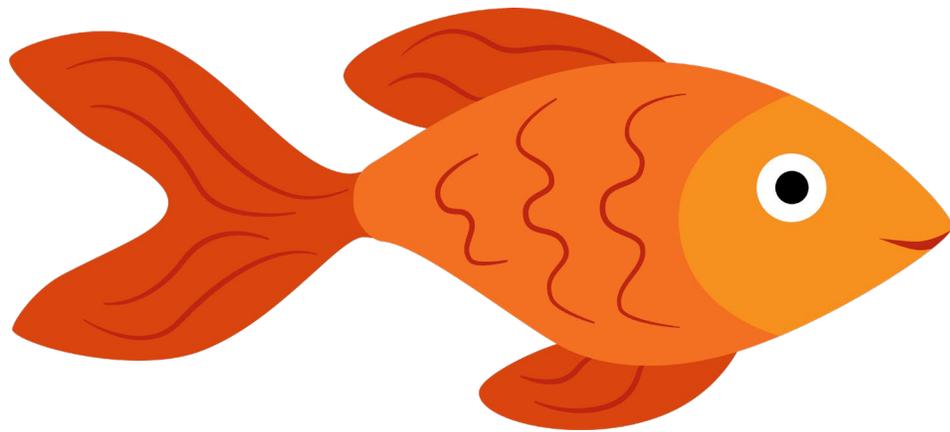
# How much of the water on earth is fresh?



**A** 2.5%

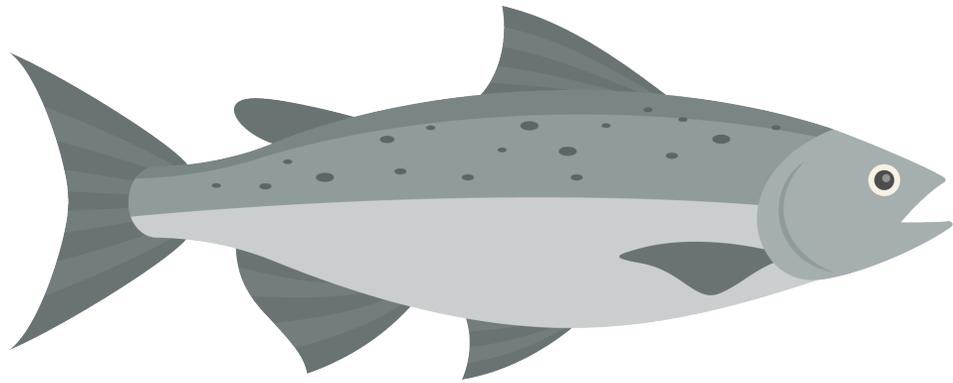
That is a small amount  
so we need to conserve.

What fish can live in both  
saltwater and freshwater?



- A** Salmon
- B** Goldfish

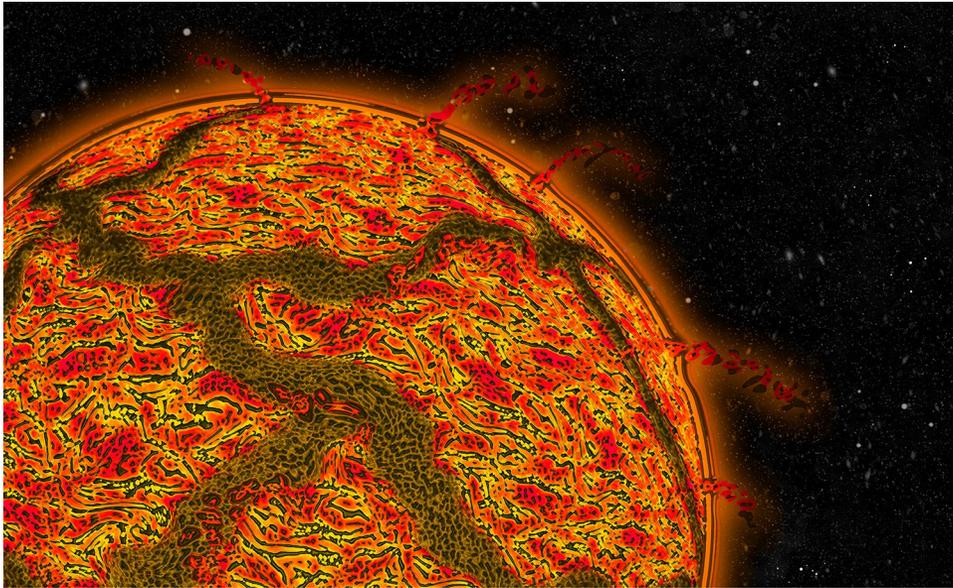
# What fish can live in both saltwater and freshwater?



## **A** Salmon

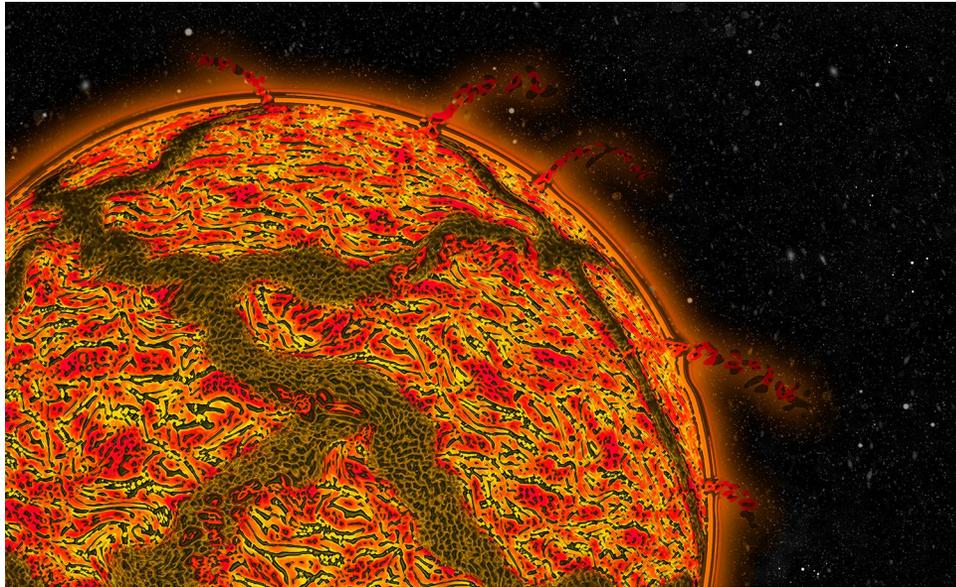
- born in freshwater
- travel to the ocean to live
- head home to freshwater to lay eggs

One billion years ago the earth had  
\_\_\_\_\_ water than now



- A** more
- B** less
- C** same amount

One billion years ago the earth had  
\_\_\_\_\_ water than now



- same amount
- there is no new water on earth

Part

2

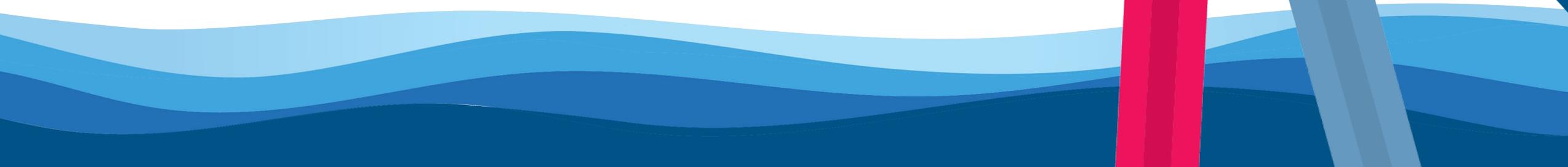


Movement  
of **WATER**

# SPEED DRAWING

Draw the following:

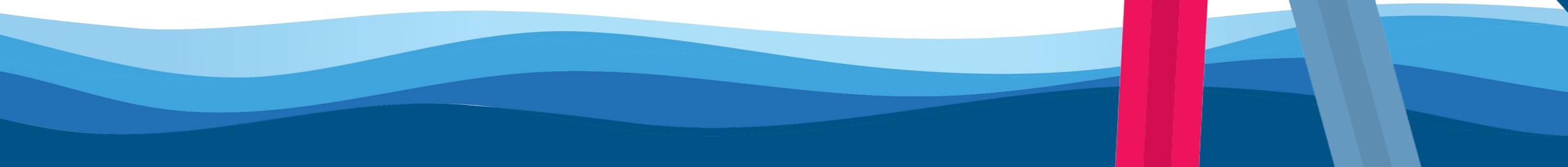
1. Ocean (at the bottom of the page)



# SPEED DRAWING

Draw the following:

1. Ocean (at the bottom of the page)
2. Sun (top corner)



# SPEED DRAWING

Draw the following:

1. Ocean (at the bottom of the page)
2. Sun (top corner)
3. Cloud (other top corner)



# SPEED DRAWING

Draw the following:

1. Ocean (at the bottom of the page)
2. Sun (top corner)
3. Cloud (other top corner)
4. Rain or snow falling



# SPEED DRAWING

Draw the following:

1. Ocean (at the bottom of the page)
2. Sun (top corner)
3. Cloud (other top corner)
4. Rain or snow falling
5. Draw an arrow from the ocean to the sun



# SPEED DRAWING

Draw the following:

1. Ocean (at the bottom of the page)
2. Sun (top corner)
3. Cloud (other top corner)
4. Rain or snow falling
5. Draw an arrow from the ocean to the sun
6. Draw an arrow from the sun to the cloud



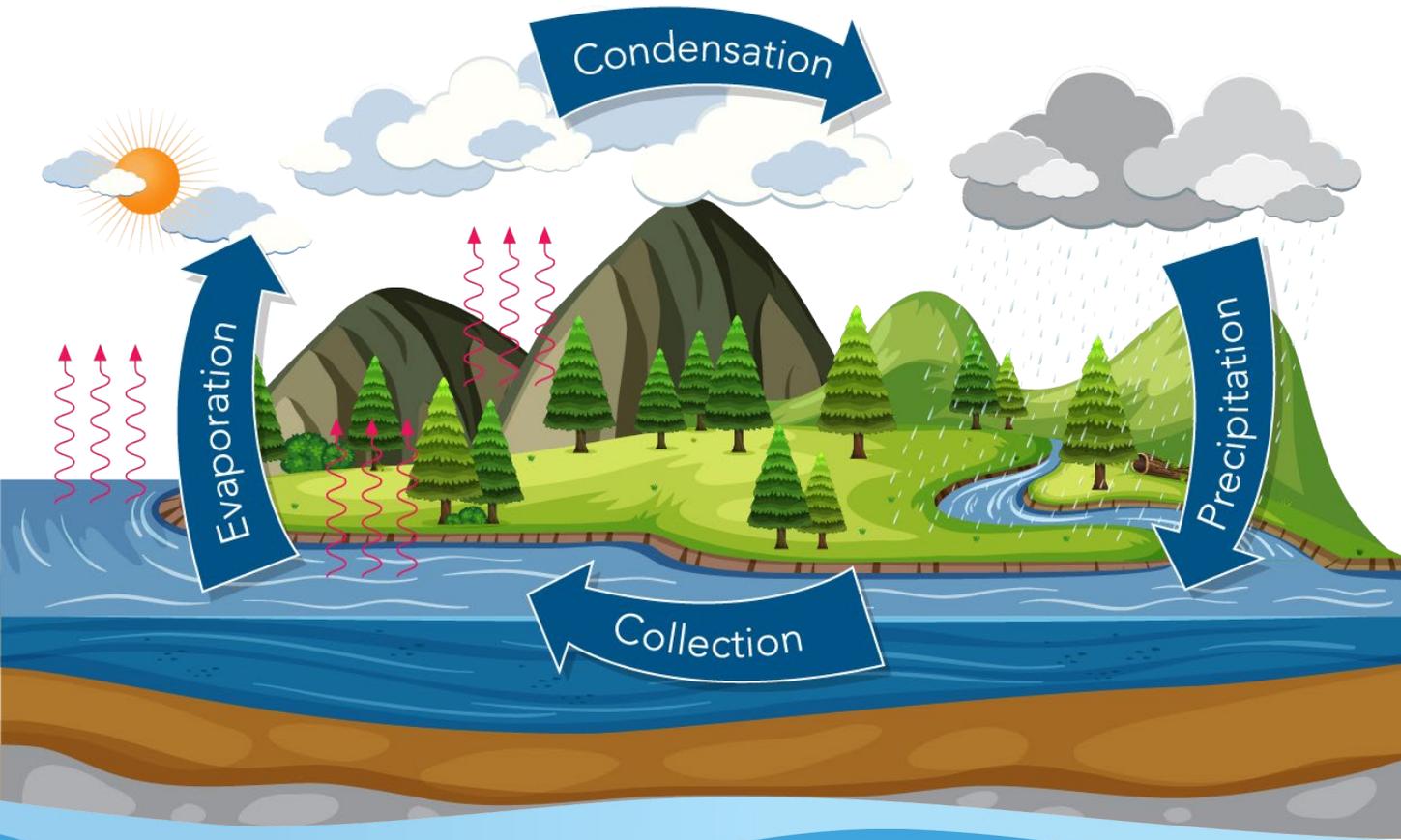
# SPEED DRAWING

Draw the following:

1. Ocean (at the bottom of the page)
2. Sun (top corner)
3. Cloud (other top corner)
4. Rain or snow falling
5. Draw an arrow from the ocean to the sun
6. Draw an arrow from the sun to the cloud
7. Draw an arrow from the rain to the ocean



# SIMPLE WATER CYCLE



**Precipitation:** rain, snow, fog, hail

**Evaporation:** liquid to gas as water heats up

**Condensation:** gas to liquid

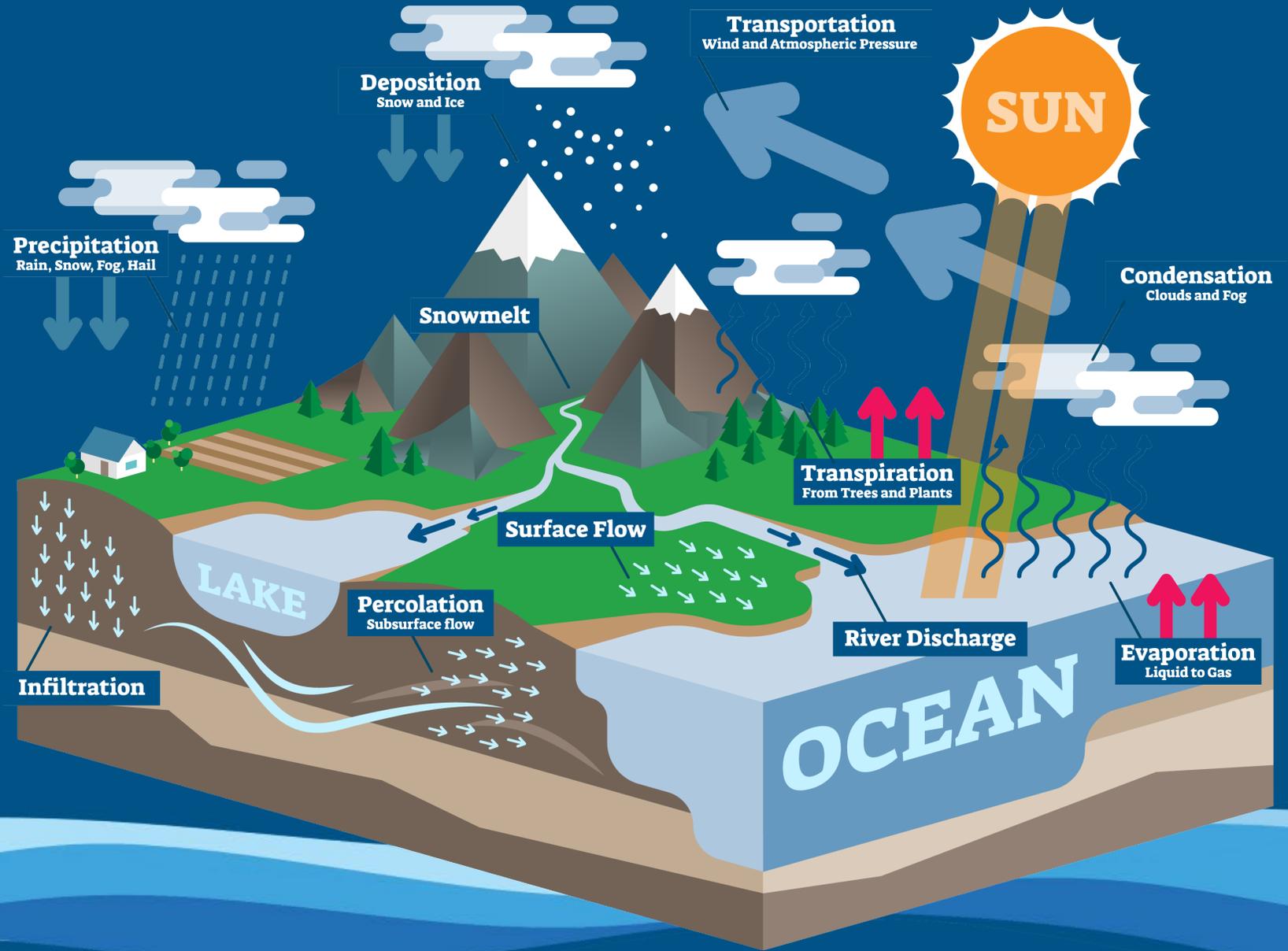
**Collection:** water collects in lakes, rivers, ground, aquifers

# WATER CYCLE STORY



**Wanda** the Water  
Droplet

# WATER CYCLE



# HEAD OUTSIDE FOR THE RUNOFF WALK

Bring:

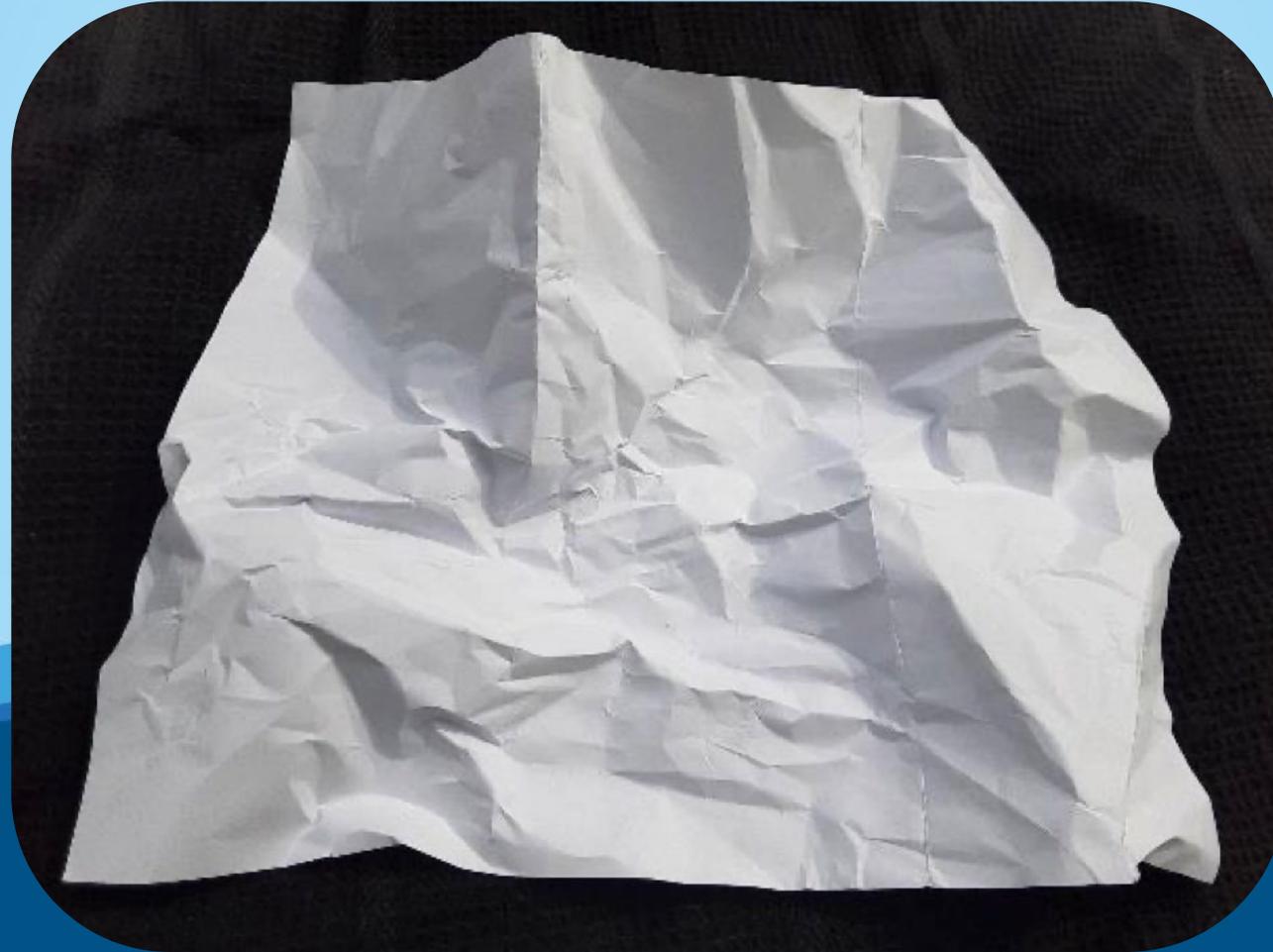
- “Runoff walk” student handouts, clipboards, pens/pencils
- Water bottle with water, food colouring



# WATERSHED MODEL



# WATERSHED MODEL



# WATERSHED MODEL



# WATERSHED MODEL



# WATERSHED MODEL



Part

3

Water Sources  
in **OUR REGION**



# WHAT'S THE DIFFERENCE?

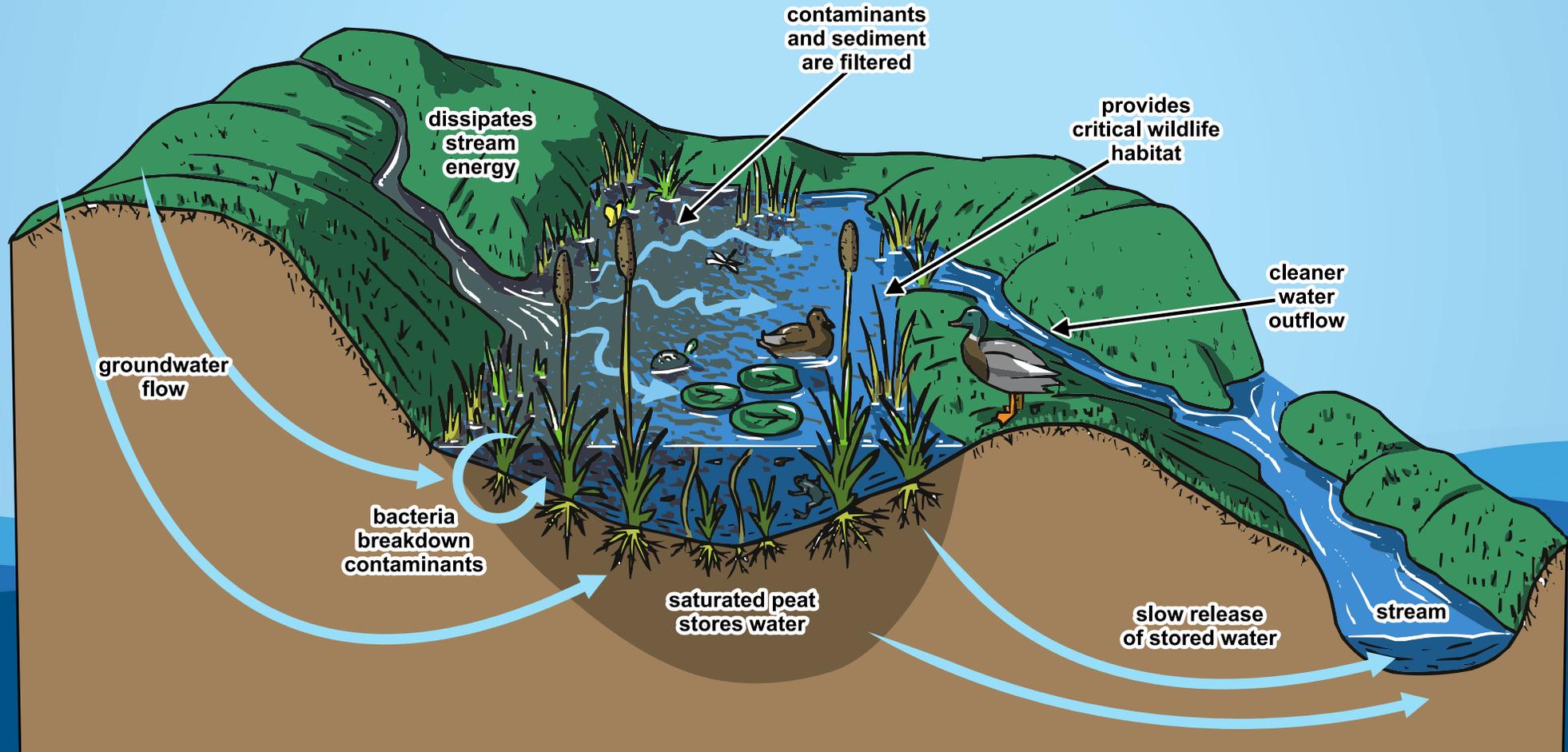
**Groundwater**



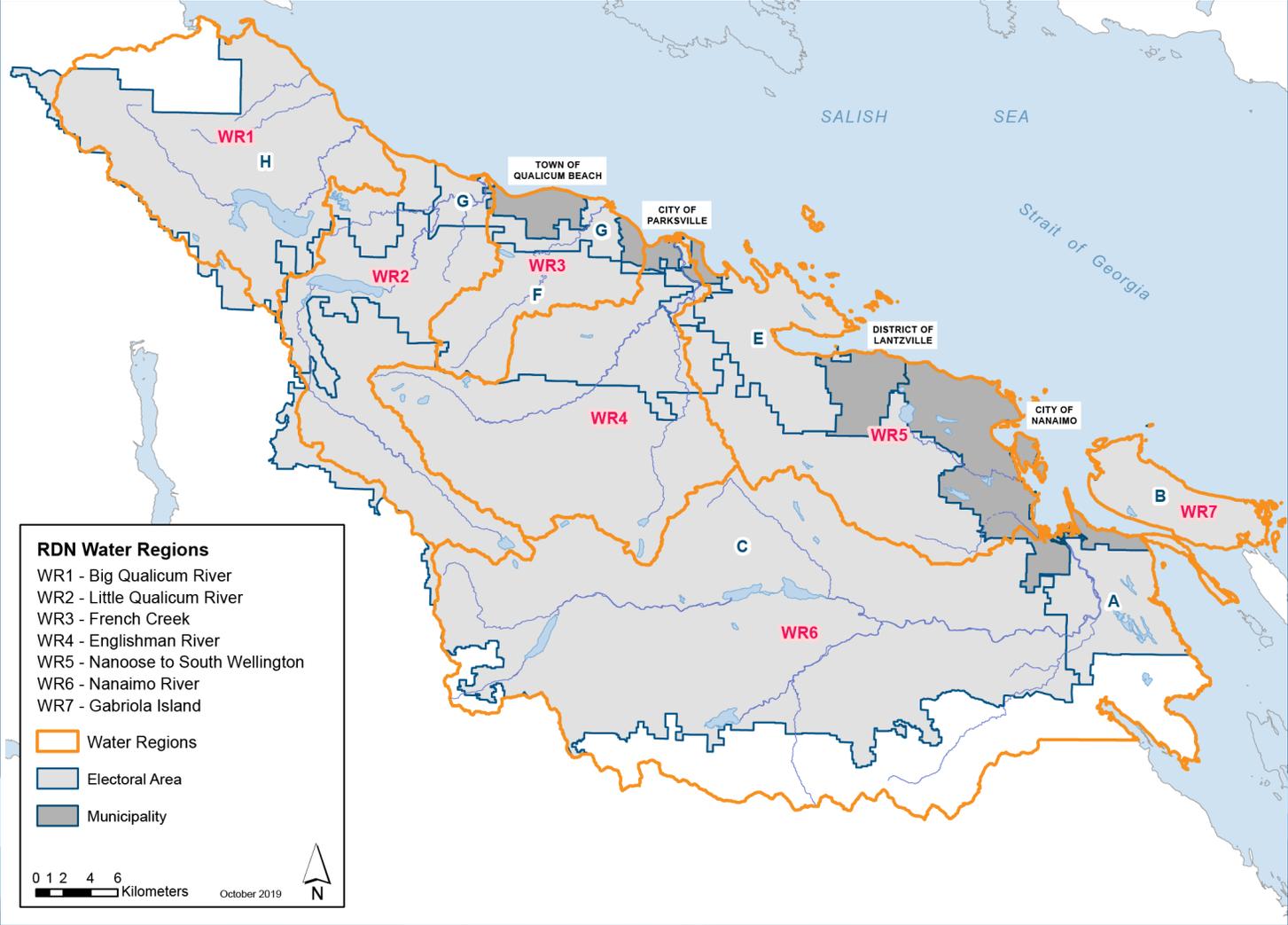
**Surface water**



# HOW WETLANDS WORK



# OUR WATER REGIONS



Part

4

How Water  
**CONNECTS US**







# WATERSHED ECOSYSTEM

- Precipitation
- Salmon habitat
- Forest
- Agriculture
- Wetland
- Urban area
- Runoff
- Groundwater

# CHOOSE ONE

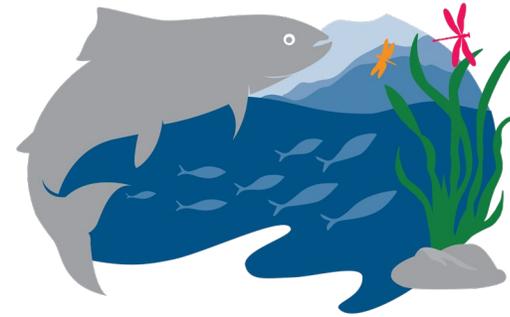
Which one is the most important for a healthy ecosystem and clean water?



**Forest**



**Precipitation**



**Salmon**



**River**

# Precipitation - Are You Important?



What happens if it does not  
rain or snow?

You are important!

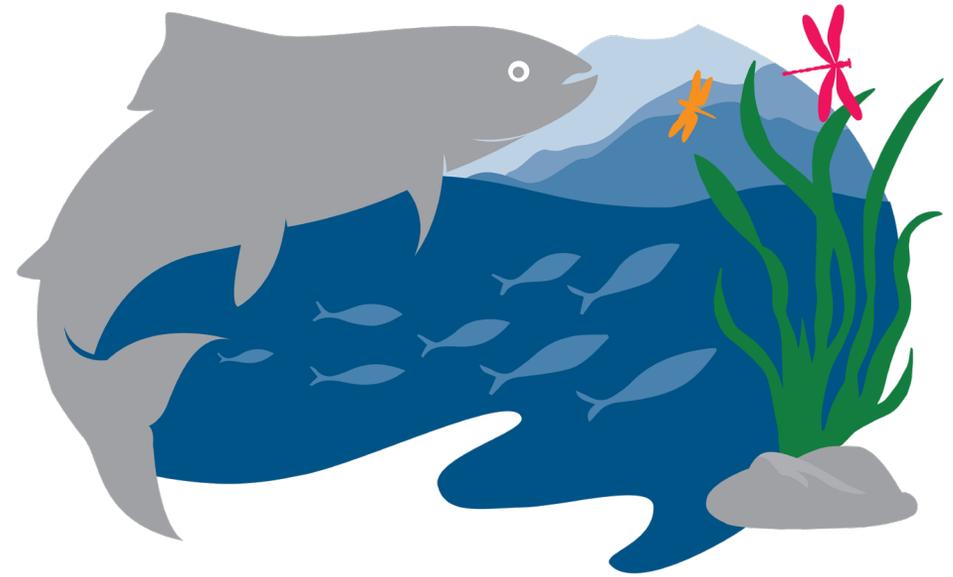
But not the *most* important.

# Salmon - Are You Important?

What would happen if salmon can't swim up the river to return home to spawn.

You are important!

But not the *most* important.



# Forest - Are You Important?



What if we allowed logging in the forest and cut down the trees?

You are important!

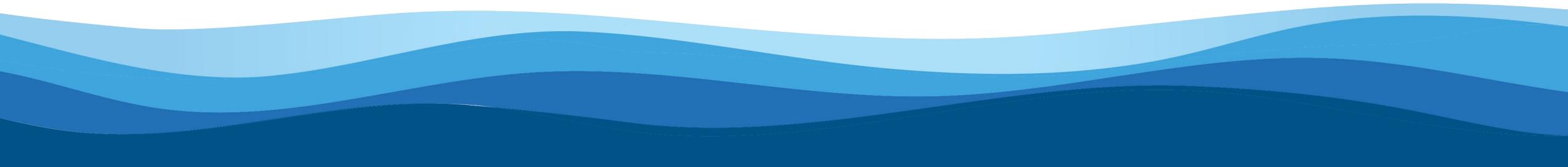
But not the *most* important.

# River - Are You Important?

What would happen if there was no river?

You are important!

But not the *most* important either.



# Interdependent Ecosystem

We rely on one another and everything in our ecosystem.

*All these elements are equally important and interconnected.*



Part

5



Water for a  
**SUSTAINABLE  
FUTURE**

# WHAT IS PERMEABILITY?



**Sieve**

More permeable



**Coffee Filter**

Less permeable



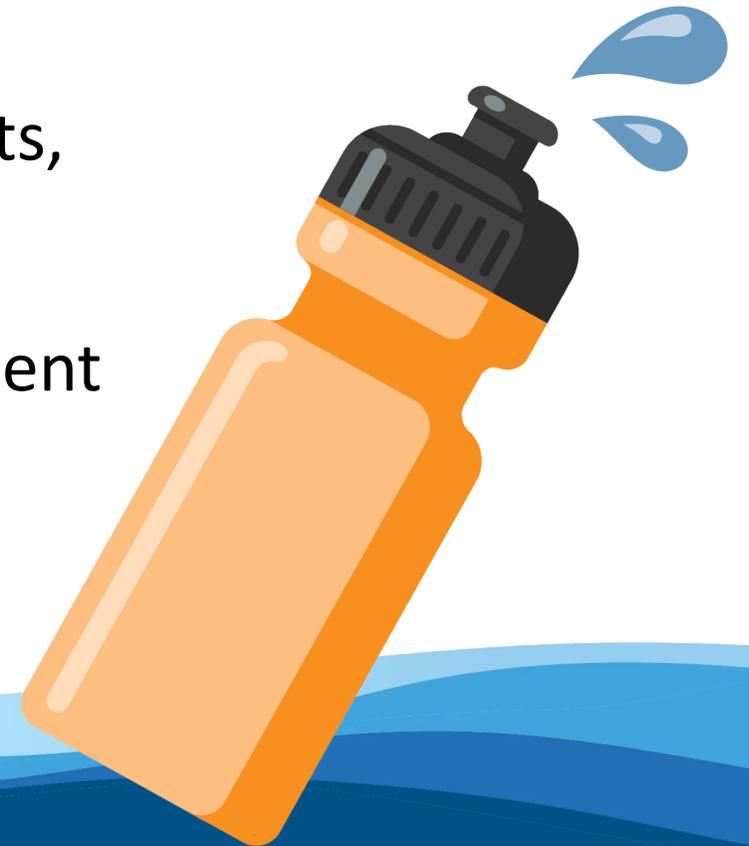
**Clay Pot**

Least permeable

# HEAD OUTSIDE TO INVESTIGATE PERMEABILITY

Bring:

- “Permeability survey” student handouts, clipboards, pens/pencils
- Water bottles with water, one per student
- About 4 metres of string, and a timer



# IMPERMEABLE SURFACES





# WATER-FRIENDLY DESIGN

## **Bioswales**

Water from the parking lot goes into this green space, instead of a drain

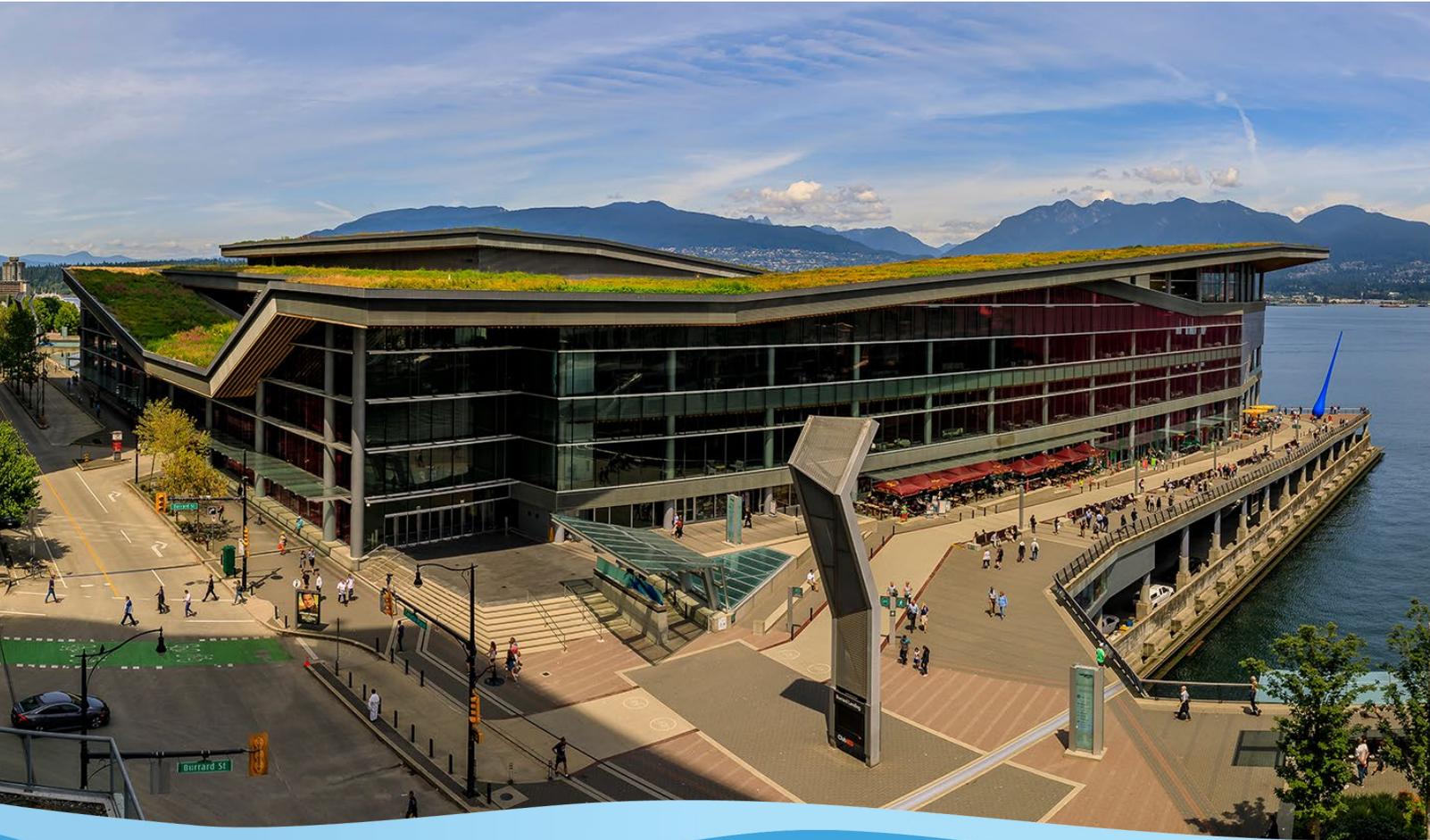


# WATER-FRIENDLY DESIGN

## **Permeable Paving**

with gaps to allow water  
to go through

# WATER-FRIENDLY DESIGN



## **Green Roofs**

slow down the  
flow of the water  
and are beautiful



Part

6

Water  
**WRAP UP**



# WATER CHALLENGE GAME

Water Cycle	Freshwater or Saltwater (or both)	Managing Water	Ecosystem Services
<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>
<u>200</u>	<u>200</u>	<u>200</u>	<u>200</u>
<u>300</u>	<u>300</u>	<u>300</u>	<u>300</u>
<u>400</u>	<u>400</u>	<u>400</u>	<u>400</u>



## WATER CYCLE - 100

What is the scientific word for rain or snow?

[Home](#)

[Answer](#)



# WATER CYCLE – 100 ANSWER

## Precipitation

[Home](#)



## WATER CYCLE - 200

What is the scientific word for when the sun heats up the water and it becomes gas?

[Home](#)

[Answer](#)



# WATER CYCLE - 200 ANSWER

## Evaporation

[Home](#)



## WATER CYCLE - 300

What is the scientific word for when water cools and becomes clouds?

[Home](#)

[Answer](#)



# WATER CYCLE - 300 ANSWER

## Condensation

[Home](#)



## WATER CYCLE - 400

What is the scientific word for when water evaporates from trees and plants?

[Home](#)

[Answer](#)



# WATER CYCLE - 400 ANSWER

## Transpiration

[Home](#)



FRESH OR SALT - 100

*Is it freshwater or saltwater or both?*

The ocean

[Home](#)

[Answer](#)



# FRESH OR SALT – 100 ANSWER

Salt

[Home](#)



## FRESH OR SALT - 200

*Is it freshwater or saltwater or both?*

A river

[Home](#)

[Answer](#)



## FRESH OR SALT – 200 ANSWER

Fresh

[Home](#)



## FRESH OR SALT - 300

*Is it freshwater or saltwater or both?*

Groundwater

[Home](#)

[Answer](#)



FRESH OR SALT – 300 ANSWER

Fresh

[Home](#)



## FRESH OR SALT - 400

*Is it freshwater or saltwater or both?*

A delta

[Home](#)

[Answer](#)



FRESH OR SALT - 400 ANSWER

Both

[Home](#)



## MANAGING WATER - 100

This item collects water from our roofs



## MANAGING WATER - 100

A rain barrel or rain cistern



## MANAGING WATER - 200

This is where water on the roads  
in a city goes after a storm



# MANAGING WATER - 200

## Storm drain

[Home](#)



## MANAGING WATER - 300

Which is more permeable,  
a flower garden or a sidewalk?

[Home](#)

[Answer](#)



# MANAGING WATER - 300

A flower garden

[Home](#)



## MANAGING WATER - 400

Which is more permeable,  
a soccer field or the forest floor?

[Home](#)

[Answer](#)



# MANAGING WATER - 400

## The forest floor

[Home](#)



## ECOSYSTEM SERVICES - 100

This part of the ecosystem holds  
on to rocks and soil on the mountainside



# ECOSYSTEM SERVICES - 100

Forest/trees

[Home](#)



## ECOSYSTEM SERVICES - 200

This part of the ecosystem provides us with hydration



# ECOSYSTEM SERVICES - 200

Water

[Home](#)



## ECOSYSTEM SERVICES - 300

This part of the ecosystem decomposes and becomes food for animals and fertilizer for the forest



# ECOSYSTEM SERVICES - 300

Salmon/fish/wildlife

[Home](#)



## ECOSYSTEM SERVICES - 400

This part of the ecosystem stores surface water

[Home](#)

[Answer](#)



# ECOSYSTEM SERVICES - 400

Lakes/ponds

[Home](#)

THANK YOU!



REGIONAL  
DISTRICT  
OF NANAIMO