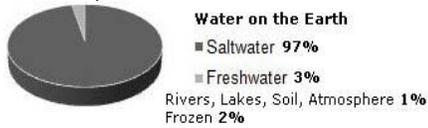


## WATER DISTRIBUTION

The water on our planet exists in many different forms and is evenly distributed over the entire planet.



Drinking water must be fresh water, not salt water. Not all freshwater on the Earth is drinkable. Water that is drinkable (safe to drink) is called **potable** water.

A **watershed** (also called a drainage basin) is a region of interconnected rivers and streams. Canada has 9% of the world's **freshwater**.

A **reservoir** is an artificial lake used for storage and management.

## WATER QUALITY

Water quality describes how pure (clean) the water is. Water quality can be measured by the types of substances that are found in it; including living organisms, organic material, minerals and other chemicals.

Many different substances can be present in water. Most substances that are found dissolved in water are **salts**. The most common salt is sodium chloride (table salt). The total amount of **all salts** found in water is called **salinity**. Saltwater (found in oceans) has a higher salinity (average of 3.5%) than freshwater.

Water described as "hard" is high in dissolved minerals, specifically calcium and magnesium. Hard water is not a health risk, but a nuisance because of mineral buildup on plumbing fixtures and poor soap and/or detergent performance.

## WATER QUALITY TESTING

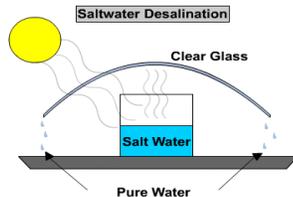
Just looking at water in a glass will not tell you if the water is safe to drink. Smelling it may give you additional information – like it may contain **hydrogen sulphide** (which is harmful to humans) giving it a rotten egg smell. Ocean water is very clear, but cannot be consumed because of its high salinity.

To determine water quality the following criteria are used:

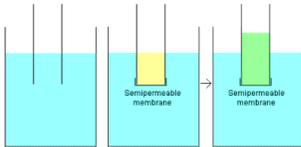
- **Taste and odour**
- **Turbidity (cloudiness) and colour**
- **Toxic substances and other pollutants**
- **Bacteria**
- **Hardness or mineral content**
- **pH (how acidic or basic the water is)**
- **Dissolved oxygen level**
- **Suspended solids (including those floating)**
- **Dissolved solids**

## DESALINATION TECHNIQUES

**Distillation** - a process in which a liquid or vapour mixture of two or more substances is separated into its parts, by the application and removal of heat. (Desert Tent Method)



**Reverse Osmosis** - forces saltwater through a filter (membrane) allowing water to pass but not salt.



## WAVES

Waves are "a disturbance, or variation transferring energy progressively from point to point in a medium" occurring whenever a force comes in contact with water moving along the water's surface. Although waves can move a very long distance, the water doesn't move – it acts as the medium for the '**wave action**' to occur. Within each wave the particles of water move in a circular motion. A boat on the surface of the water will cause a '**wash**' or '**wave action**' – which can affect other objects in the water, as well as the shoreline. Most waves are caused by the wind (a force). Stronger forces cause larger waves (Underwater earthquakes can cause **tsunamis** - 'harbour waves'). As ocean waves move closer to the shore their bottoms drag on the ocean floor and their tops rise and break onto the shore (causing damage by their force). The force of waves crashing against a shoreline can cause changes to the shape of the shoreline,

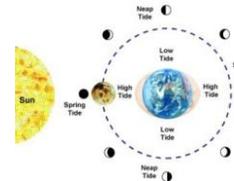
## TIDES

The water level along the coast of continents changes constantly. Tides are the regular rising and falling of very large bodies of water. This water level is called a **tide**.

**High tide** is the highest level the water will reach on shore, while **Low tide** is the lowest level it will reach onshore.

Usually there are two high tides and two low tides each day.

The gravitational force of the moon and the rotation of the Earth on its axis cause tides.



## EROSION & DEPOSITION

Moving water is a powerful force. When water wears away rock the fragments are carried as sediment and deposited elsewhere. A river's sediment-load is the amount of **water-borne** materials (rock, soil, organic matter) it carries. The faster the river flows, the more water-borne materials it can carry. As it slows these water-borne materials are deposited as sediment.

## WEATHERING

Erosion of the landscape can also occur as a result of chemicals in the water. These chemicals can eat away rock forming **caves and sink holes**.

'**Frost wedging**' can also breakup rocks when water enters cracks and freezes.

## RIVER PROFILE

A stream profile is a description of its characteristics, including:

- flow rate
- steepness of stream's bed
- erosion rate of its banks.

The **source** of a river may be high in the mountains, where a glacier is melting. As small streams form together into one **channel**, the volume and speed of the river grows. In the early stages, the river is flowing very quickly and usually fairly straight. As the river reaches lower elevations it begins to slow, causing curves to form (**meanders**), until it reaches a fairly flat flood plain and the sediment it has picked up is deposited in a fan-shaped deposit called a **delta**.

## WATERSHEDS

A watershed is all the area of land that drains into one main lake or river. It can contain many smaller streams, rivers and even lakes, which all eventually drain into a larger lake, sea or ocean.

The location of the highest land on the continent determines the direction that a watershed drains. This high land is called the **Continental Divide**. In North America it is in the Rocky Mountains.

On the **West side** of the divide, the rivers all flow into the Pacific Ocean.

On the **East side** of the divide, the rivers flow into either the Arctic Ocean or the Atlantic Ocean.