



Grade 8 Science

Unit I:

Water Systems on Earth

Chapter I

Effects of Water?



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SK-2809-0114n

Churchill River



Large Ocean Wave

How do you use water?



House Hold Use



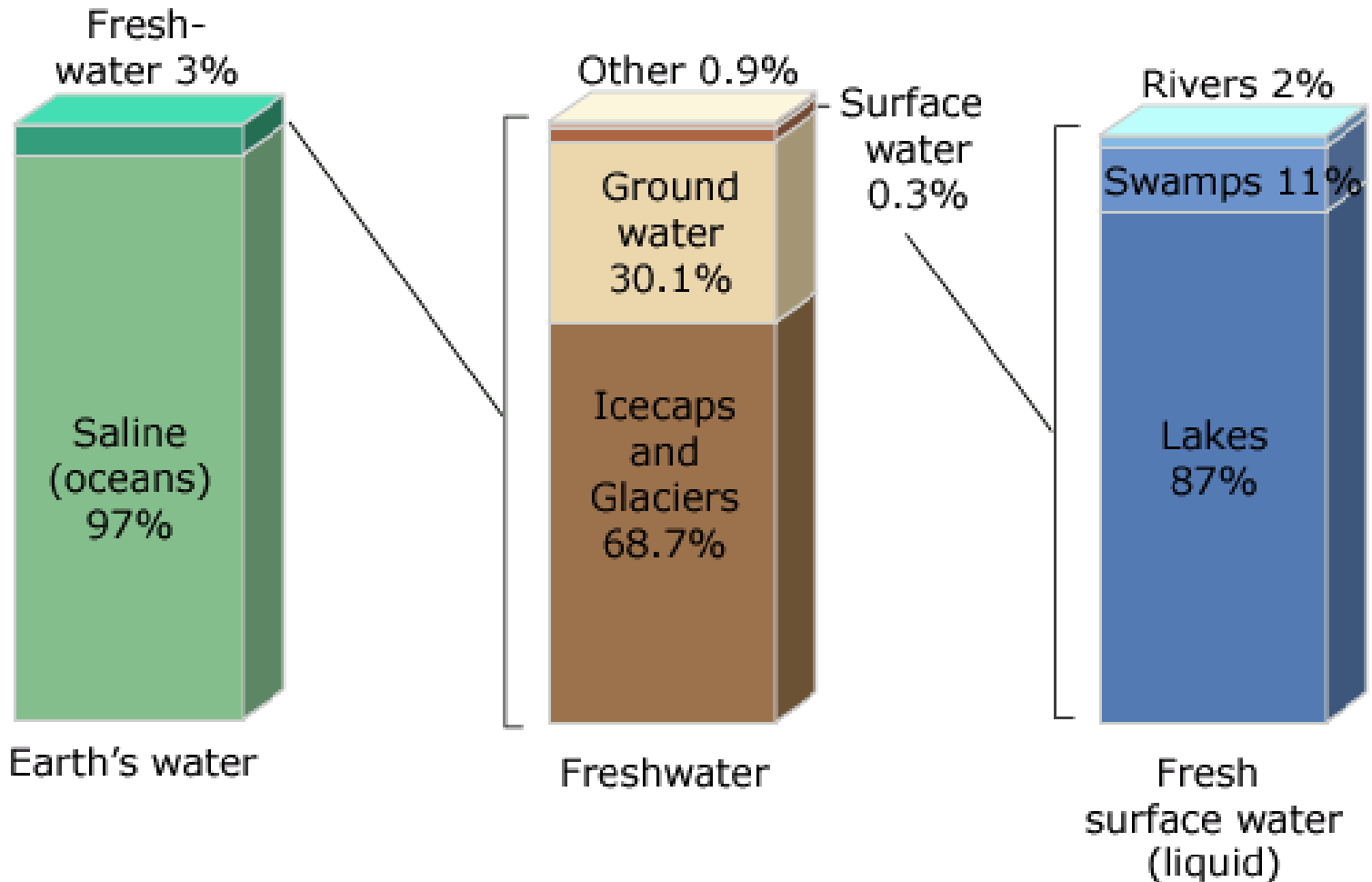
Personal Use



Recreational Activities

Water Distribution

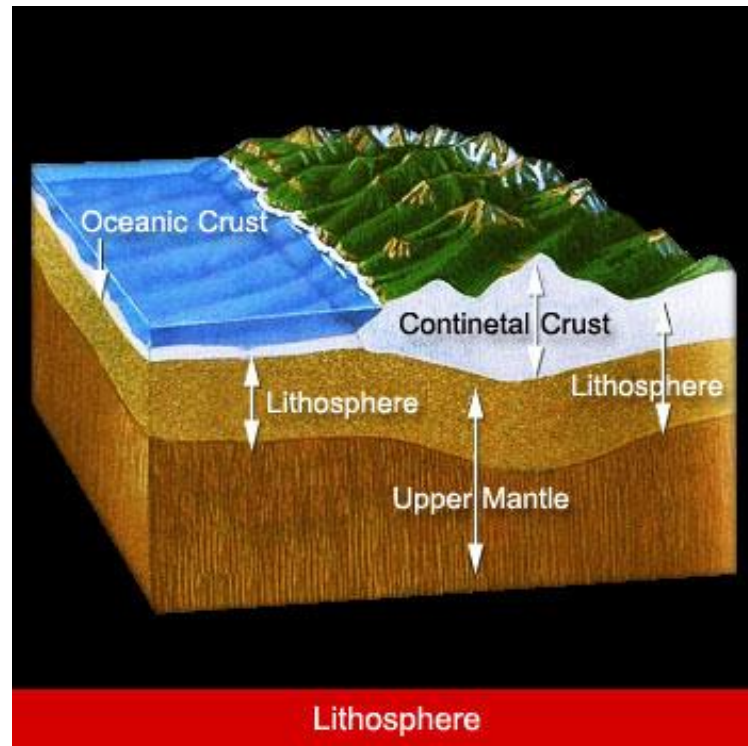
Distribution of Earth's Water



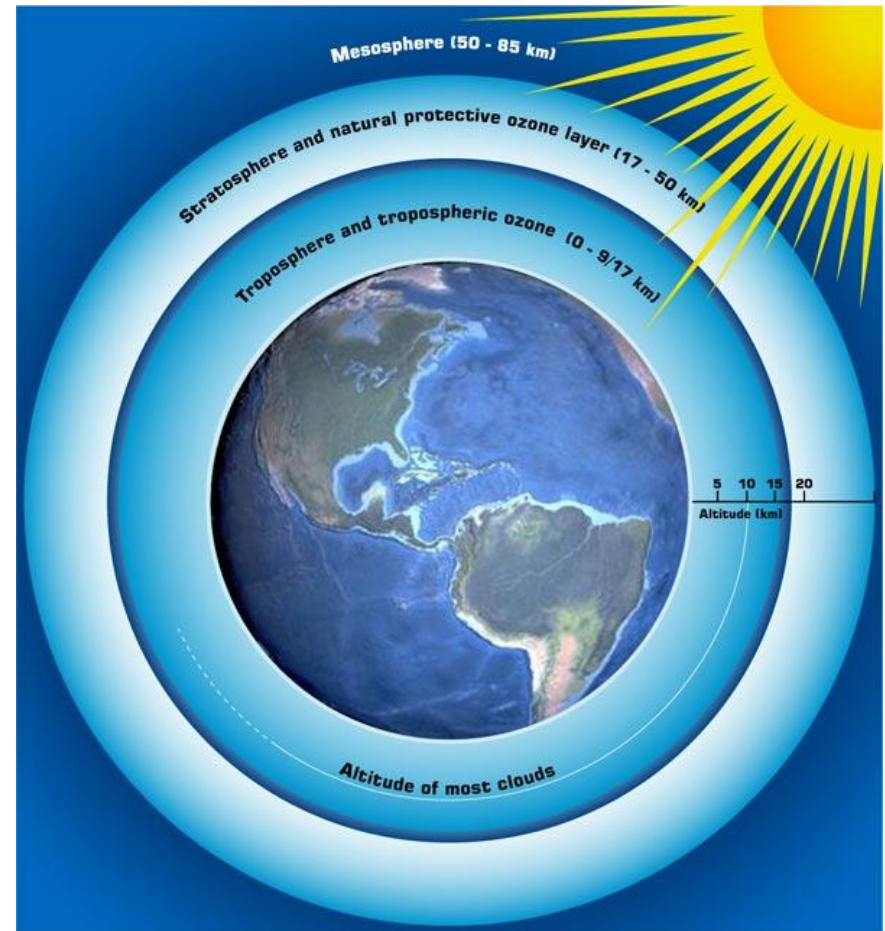
- Only 3% of the Earth's water is fresh water (no salt).
- 2/3 of this water is frozen in ice sheets.
- Therefore only 1% of the fresh water on Earth is available.

Review of Terms...

Lithosphere: the solid rocky ground of the Earth's crust.



Atmosphere: the environment surrounding the Earth.



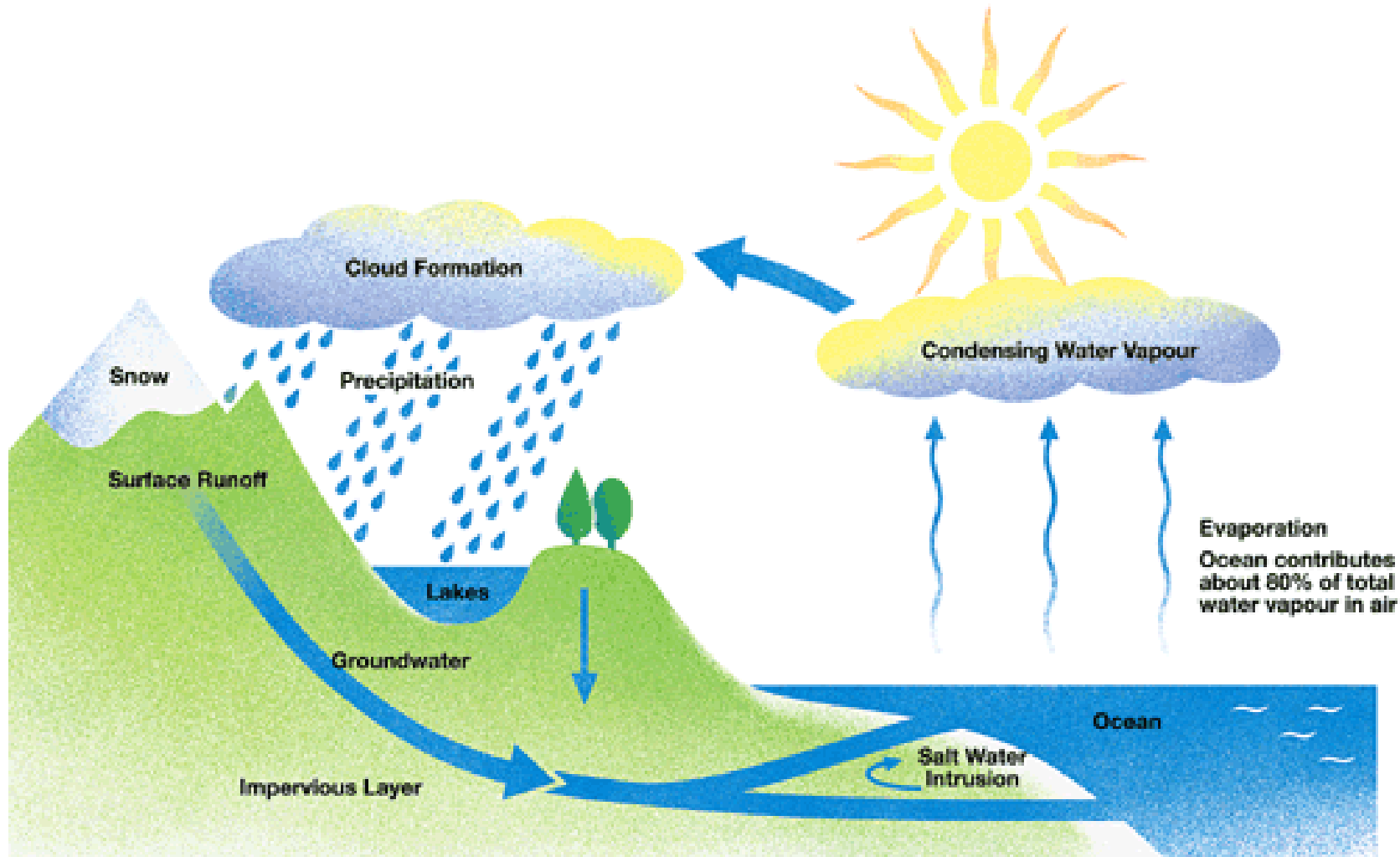
Hydrosphere: **All** water on Earth. Including that in the lithosphere and atmosphere.






**Why do we not run out
of water?**

The Water Cycle...



- The constant cycling of water through the processes of **evaporation** and **condensation**
- Water is constantly changing form
(gas  liquid)
- Driven by the sun's energy

Ocean Water vs. Fresh Water

Three ways in which fresh water differs from ocean water are:

- Salinity
- Density
- Freezing point

I. Salinity

- The amount of salt dissolved in a specific amount of water.

* *salt comes from dissolved solids in the ground and volcanoes.*



Fresh Water

- tiny amounts of salt.

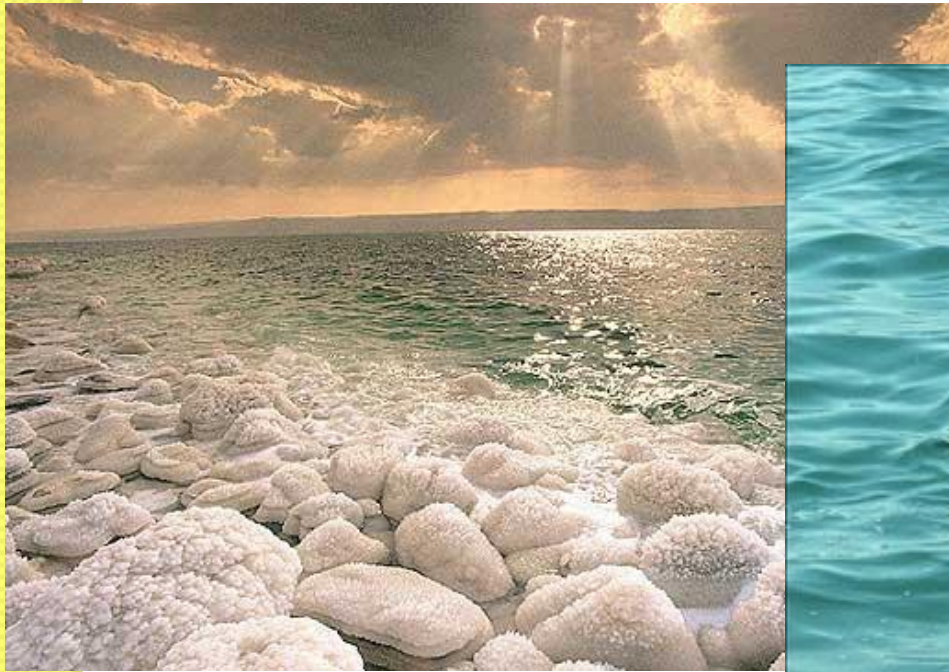
Salt Water

- Average is 35 ppt.
- Varies depending on location.
- ↑ at the equator and poles

2. Density

- The amount of mass of a substance in a certain unit volume.
- How tightly packed together the material is in a substance.

- Ocean water is more dense than fresh water due to the salt content.



The Dead Sea



3. Freezing Point

- The temperature at which a liquid freezes.

Fresh water... 0°C

Salt water... -1.9°C



Core Lab Activities

Activity I-3A

“Salinity’s Effect on Water Density”

Activity I-3B

“Temperature & Water Density”

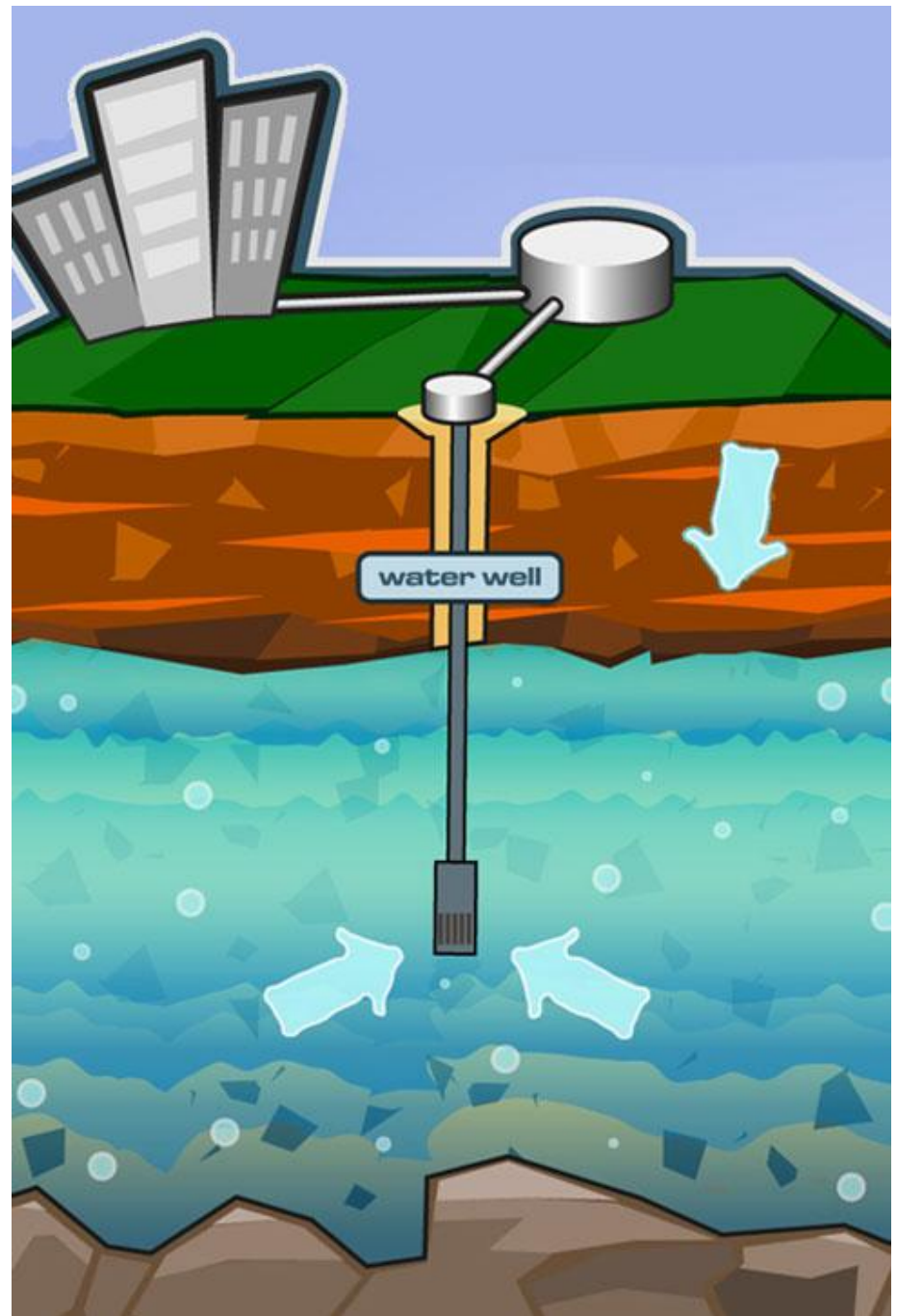
Sources of Fresh Water

1. Lakes, ponds and wetlands
2. Streams and rivers
3. Ground water
4. Glaciers
5. Drainage basins

Ground water...

- Precipitation that falls on land and sinks out of sight.
- Sinks through pores in rocks until it reaches bedrock where it pools.
- Drilling to these pools make wells.

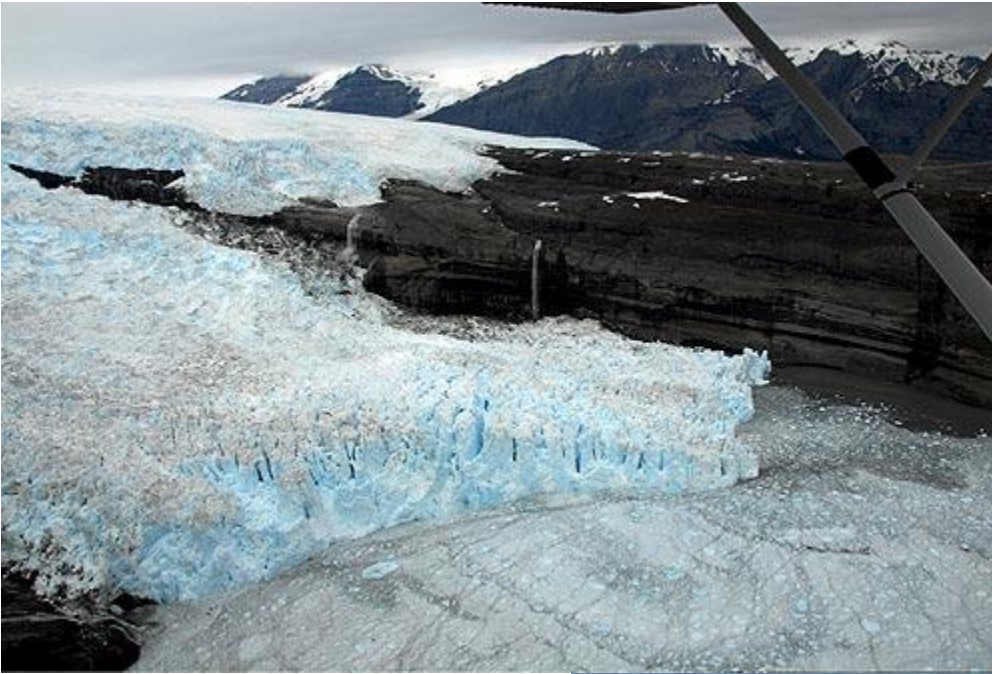
Ground Water



- **Runoff** does not sink into the ground or evaporate. It flows across the Earth's surface.
- Affected by ground material, amount of rain, length of time it rains, slope of the land, vegetation, and the amount of development.


Glaciers...

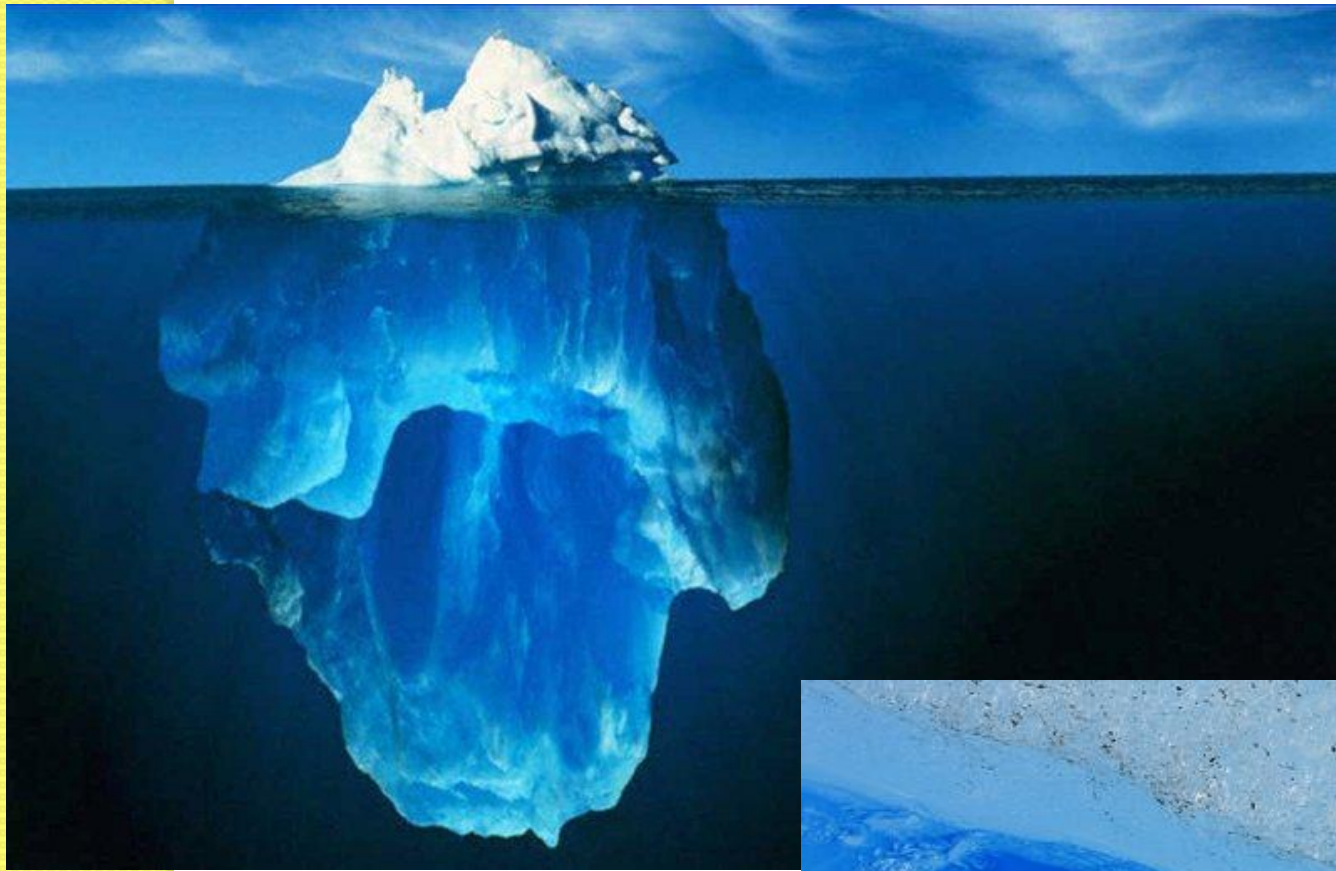
- A moving mass of snow and ice.
- Found in areas where it is so cold the snow remains all year.



*Glaciers in
mountains and on
the continent of
Antarctica*



- 
- **Glaciers slow down the passage of water through the water cycle by storing vast quantities of water. They release the water during the hot summer months.**
 - **They give us information about the Earth's past climates.**



*Water
trapped in
glacial ice*



The Ice Age

- The most recent began 120 000 years ago ending 11 000 years ago.
- Glaciers covered ~ 20% of land on Earth.



BERINGIA

ICE SHEETS

NORTH AMERICA

modern coastline

Glaciers and Global Warming

- In the last 100 years the average surface temp. Has increased by 0.5°C .
- The world's glaciers are melting at a quicker paces than ever before.



*Melting
Greenland
Glacier*



*Receding Athabasca Glacier in Alberta
It has receded 1.5 km since 1843.*



Columbia Glacier c. 1980



Columbia Glacier 2005



Arapaho Glacier 1898



Arapaho Glacier 2003

What does this mean?

- Ocean waters may rise
- Flood rivers
- If they disappear, rivers may dry up

Drainage Basins

- Watershed
- The area of land that drains into a body of water such as a river, pond, lake or ocean.
- There may be many small within a larger basin.

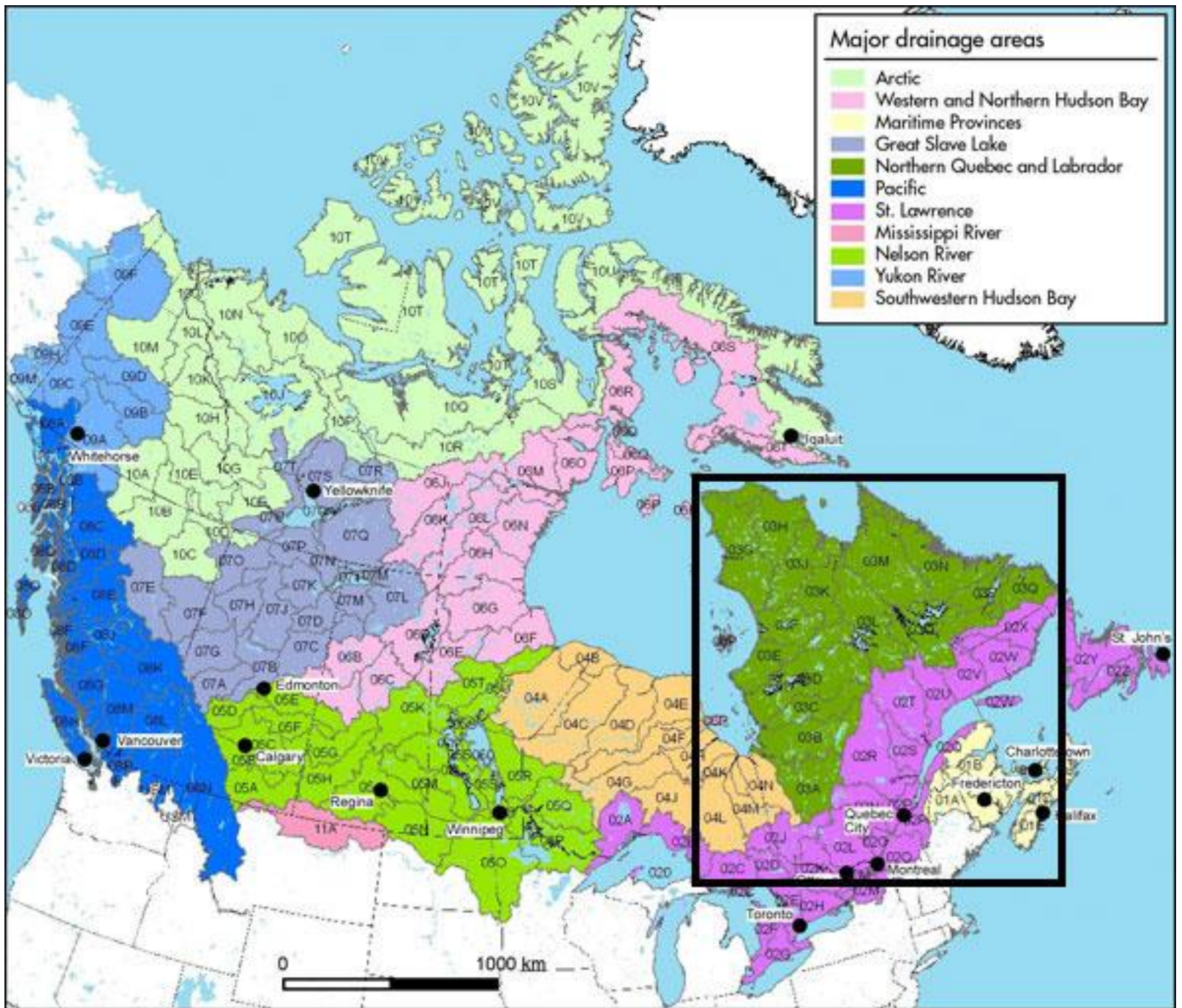
- A **divide** separates one basin from another.

Ex. The Continental Divide



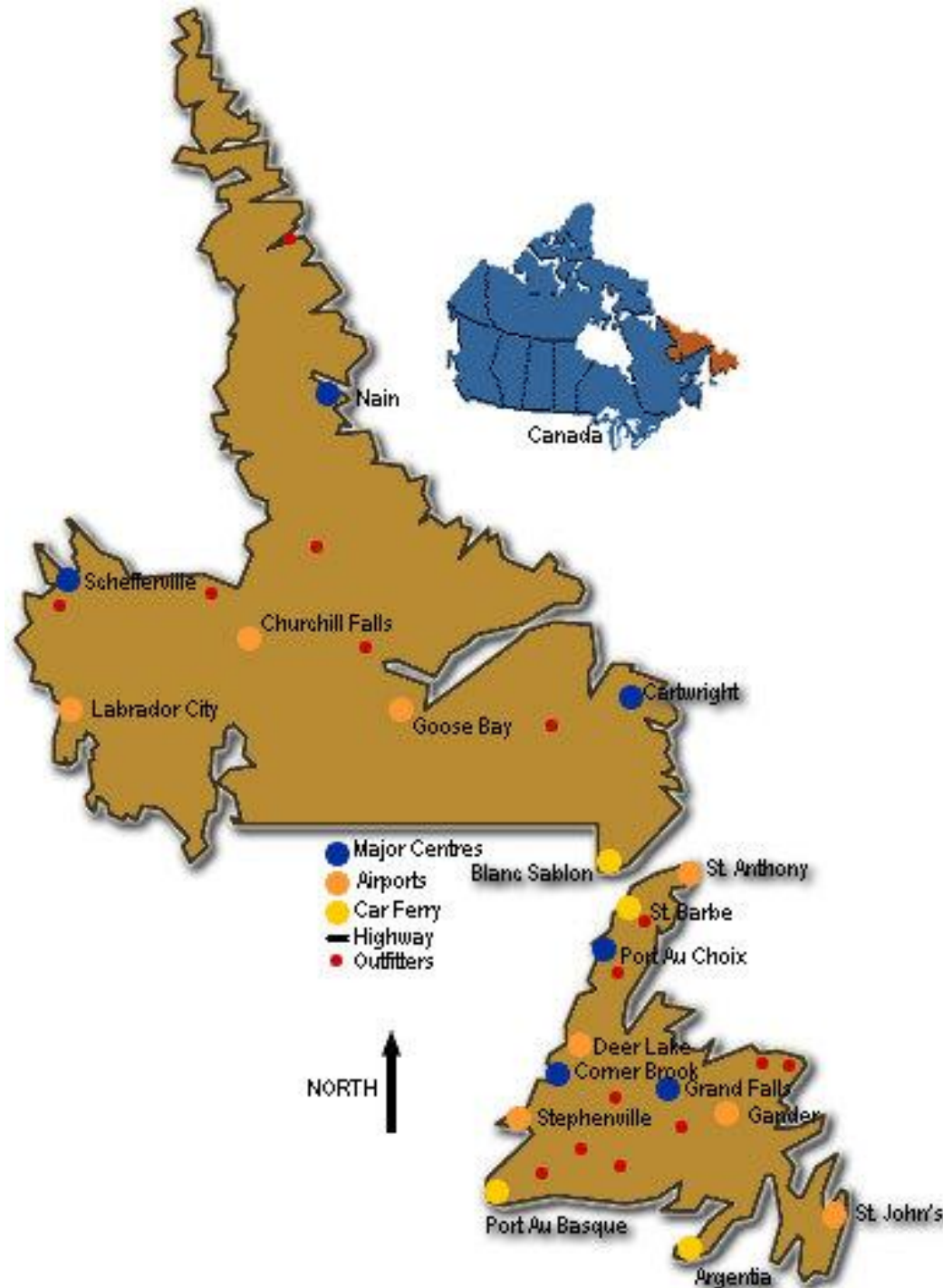


Canadian Drainage Basins



6 Major Drainage Basins in NL

1. Labrador Sea
2. Gulf of St. Lawrence
3. West Coast Gulf of St. Lawrence
4. South Coast Gulf of St. Lawrence
5. Atlantic Ocean Avalon Peninsula
6. Atlantic Ocean North-east Coast




Using pencil leads, indicate the 6 major drainage basins of NL

One Component Affects Another...

Ex. Salinity affects the types of organisms that can survive in an area.

Ex. Temperature affects the amount of dissolved oxygen in water. The lower the temp. the more oxygen.



Ex. The convergence of the Labrador current and the Gulf Stream influences productivity of the Grand Banks, the movement of icebergs, and migration of capelin and whales.