

**Geology Sildes
For Petroluem & Civil Eng.**



أَوَلَمْ يَرِ الَّذِينَ كَفَرُوا أَنَّ السَّمَاوَاتِ
وَالْأَرْضَ كَانَتَا رَتْقًا فَفَتَقْنَاهُمَا وَجَعَلْنَا
مِنَ الْمَاءِ كُلَّ شَيْءٍ حَيٍّ أَفَلَا يُؤْمِنُونَ
سورة الأَنْبِيَاءِ ٦١



Running Water

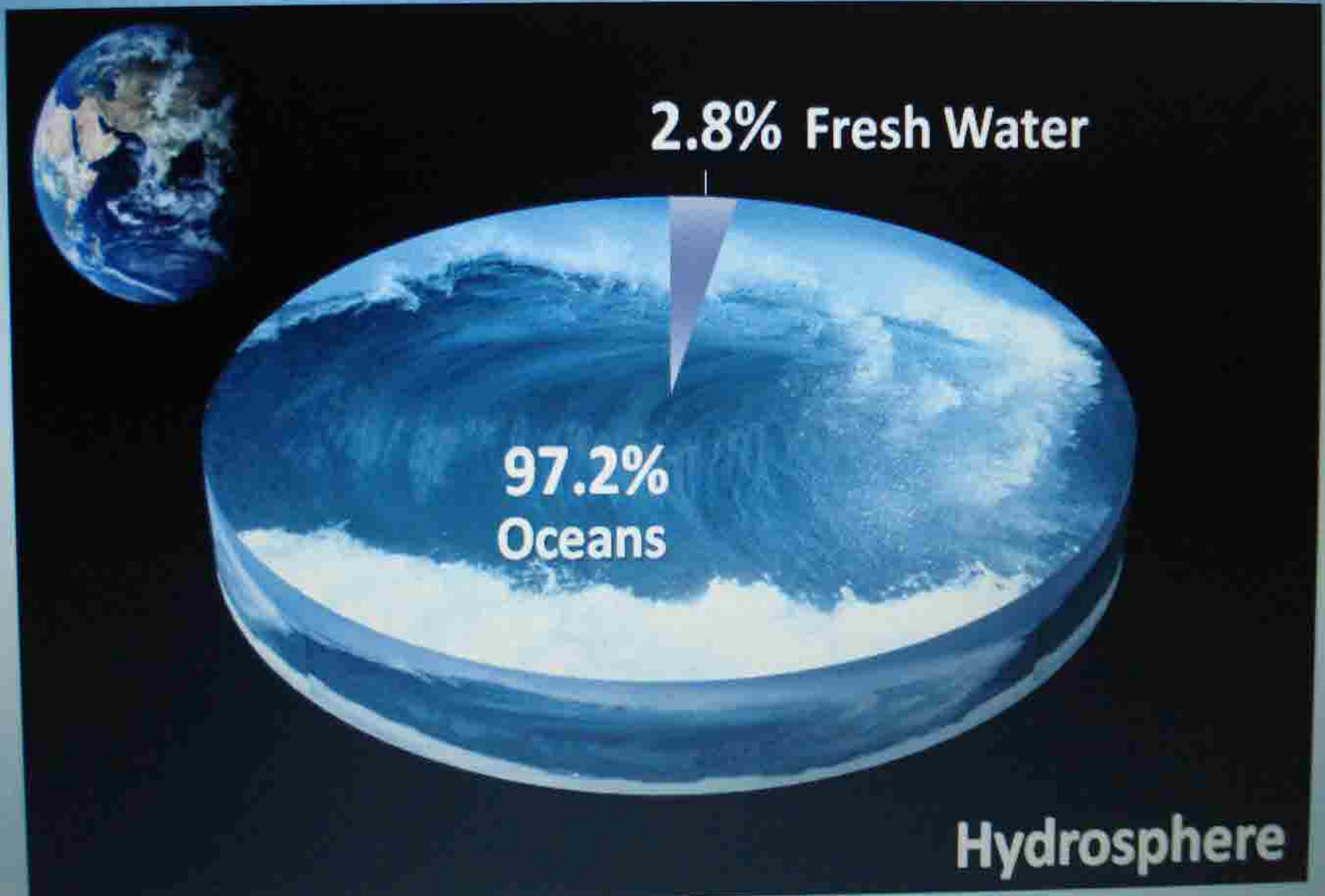
CHAPTER 16

2.8% Fresh Water



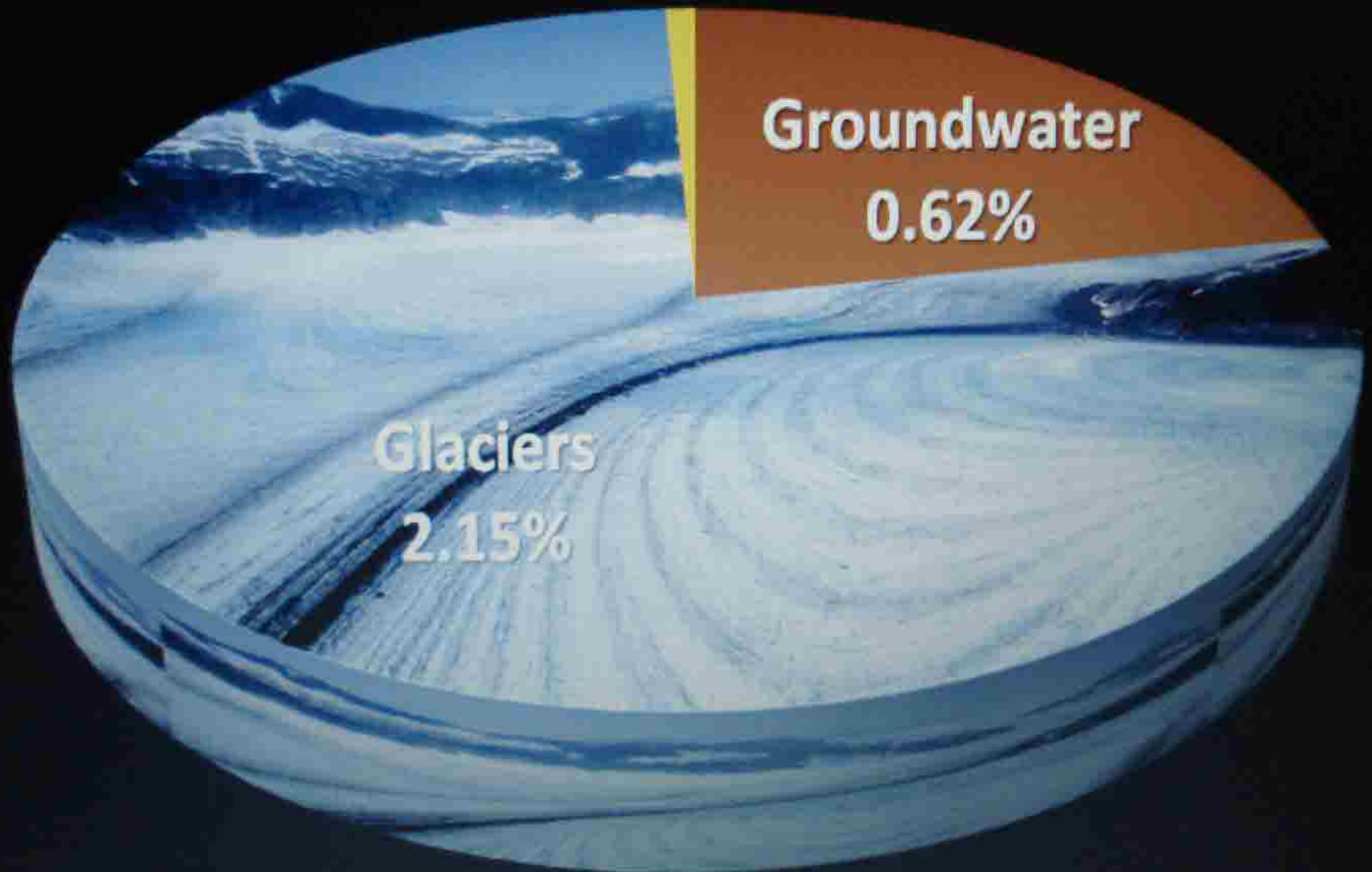
**97.2%
Oceans**

Distribution of Water on Earth



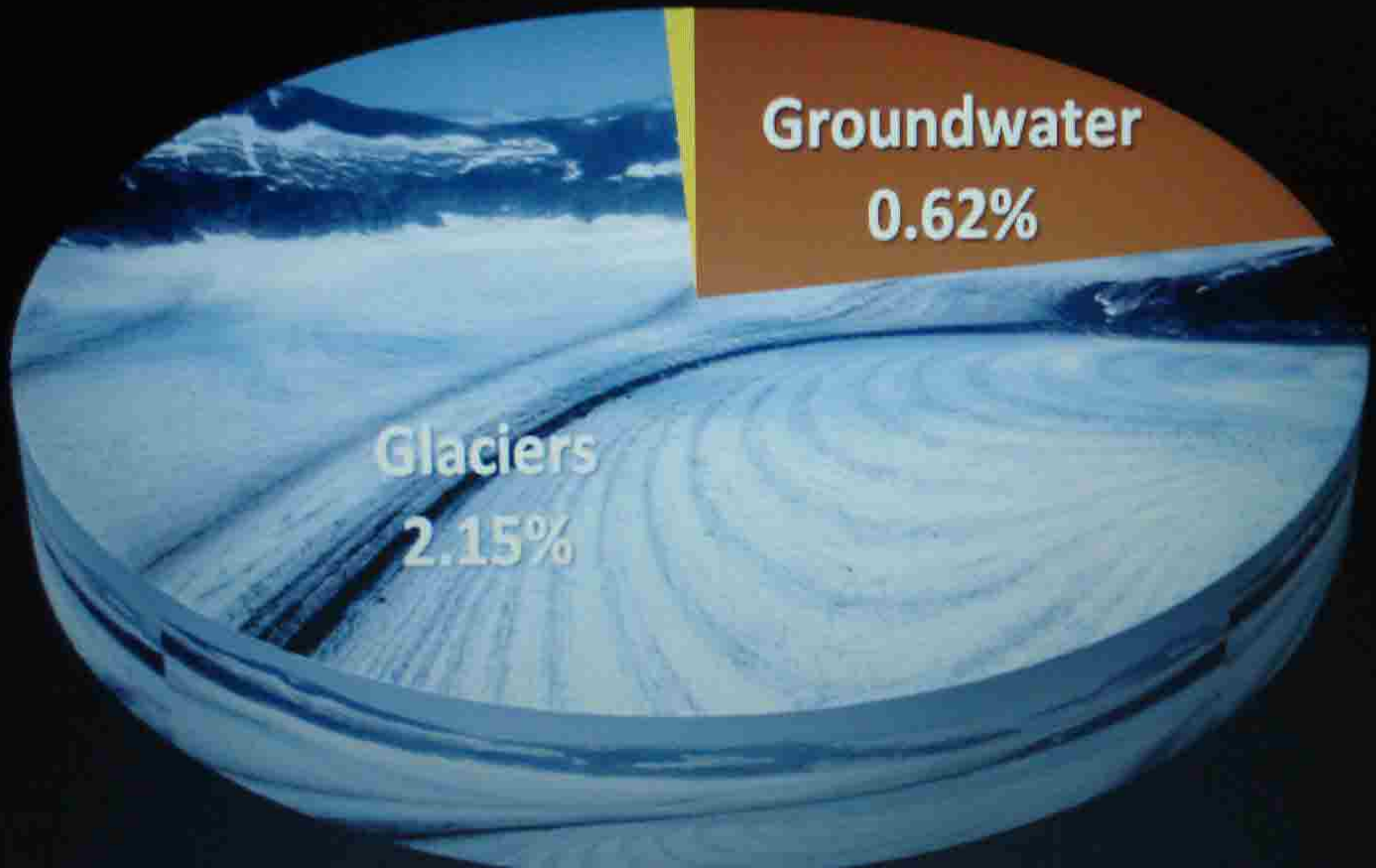
Distribution of Water on Earth

Nonocean Components

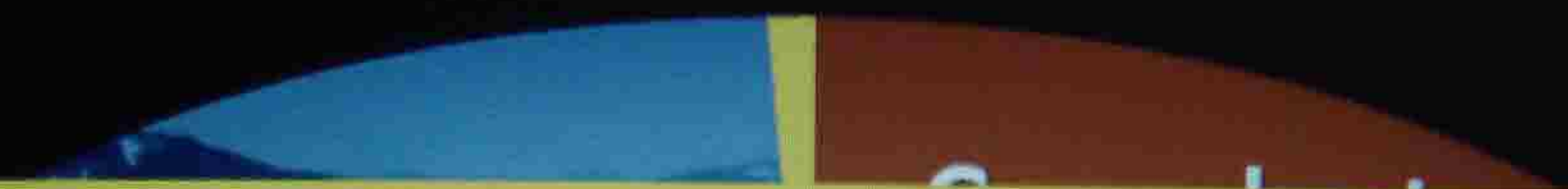


Distribution of Water on Earth

Nonocean Components



nocean Components

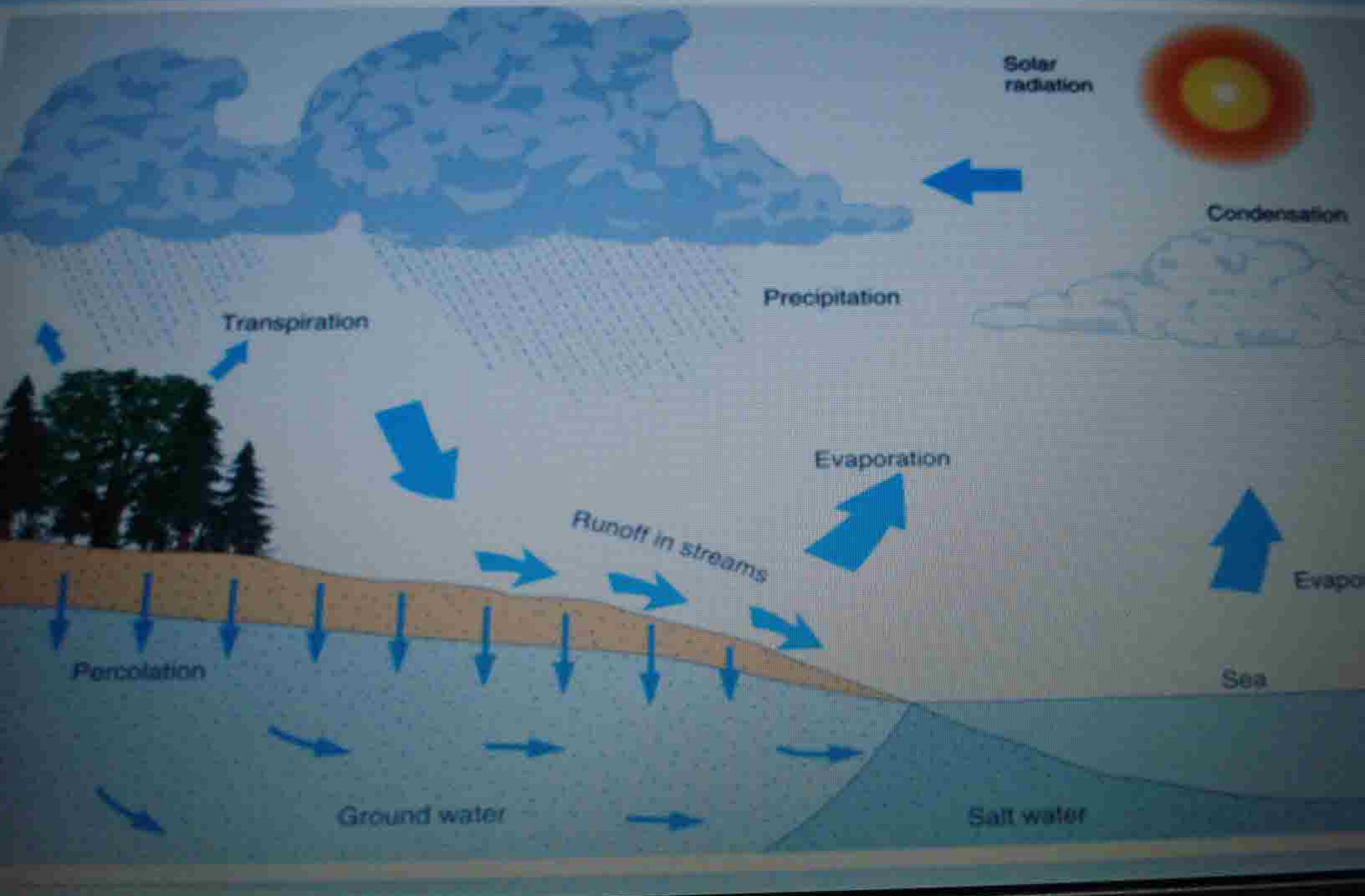


| | |
|---------------------------------------|----------------|
| Fresh water | 0.009% |
| Saline water & inland seas | 0.008% |
| Soil moisture | 0.005% |
| Stream channels | 0.0001% |
| Atmosphere | 0.001% |

The Hydrologic Cycle

Hydrologic Cycle: it describes the continuous movement of water on, above and below the surface of the Earth.





The Hydrologic Cycle

Evaporation: sea water evaporates into the atmosphere.

Condensation: moisture in the air condense into clouds.



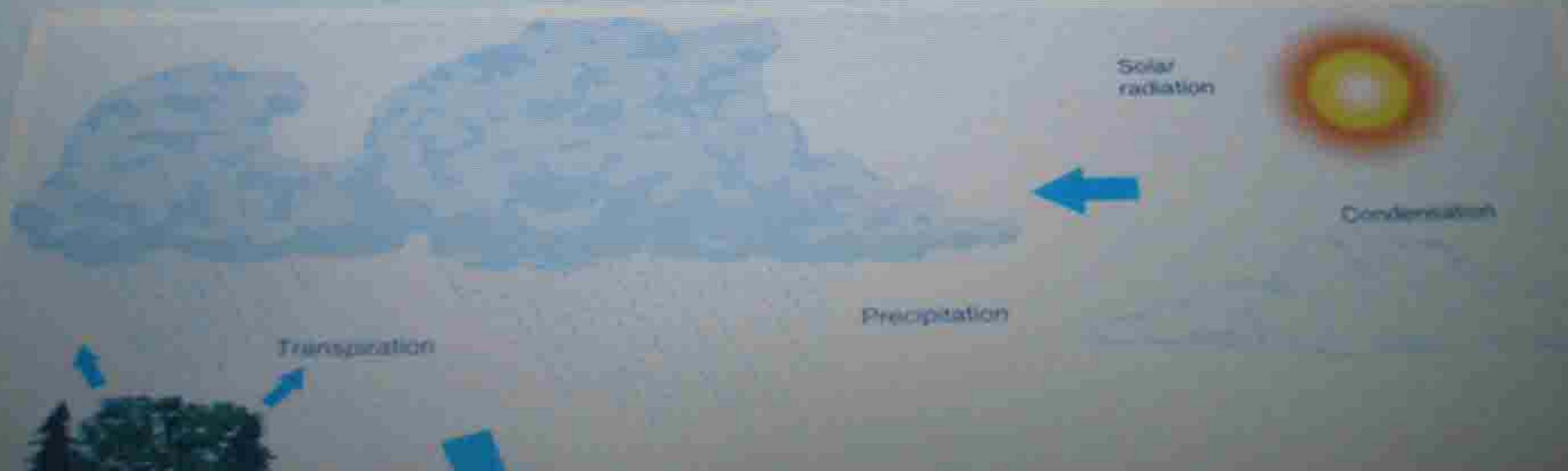
The Hydrologic Cycle

3. Precipitation: all liquid and solid water particles that fall from clouds and reach the ground including rain, hail, sleet or snow and ice crystals.



The Hydrologic Cycle

4. Infiltration: process in which water soaks into the ground; downward then laterally. Some infiltrated water is absorbed by plants. Later released into atmosphere = **Transpiration.**



Rate of rainfall is

greater than the land's ability to absorb it, the additional water flows over the surface into lakes and streams.

Then, evaporation occurs and the cycle keeps repeating itself.

- Stream transport provides a mechanism by which solid particles of various sizes are separated. This is called sorting (show animation).

- Well-sorted material typically deposited by a stream is called alluvium.

- Alluvium: unconsolidated sediment deposited by a stream.

1. **Channel deposits:** composed mostly of sand and gravel.

a. **Point bars:** a crescent-shaped accumulation of sand and gravel deposited on the inside of a meander.

Deposition of Sediment by Streams

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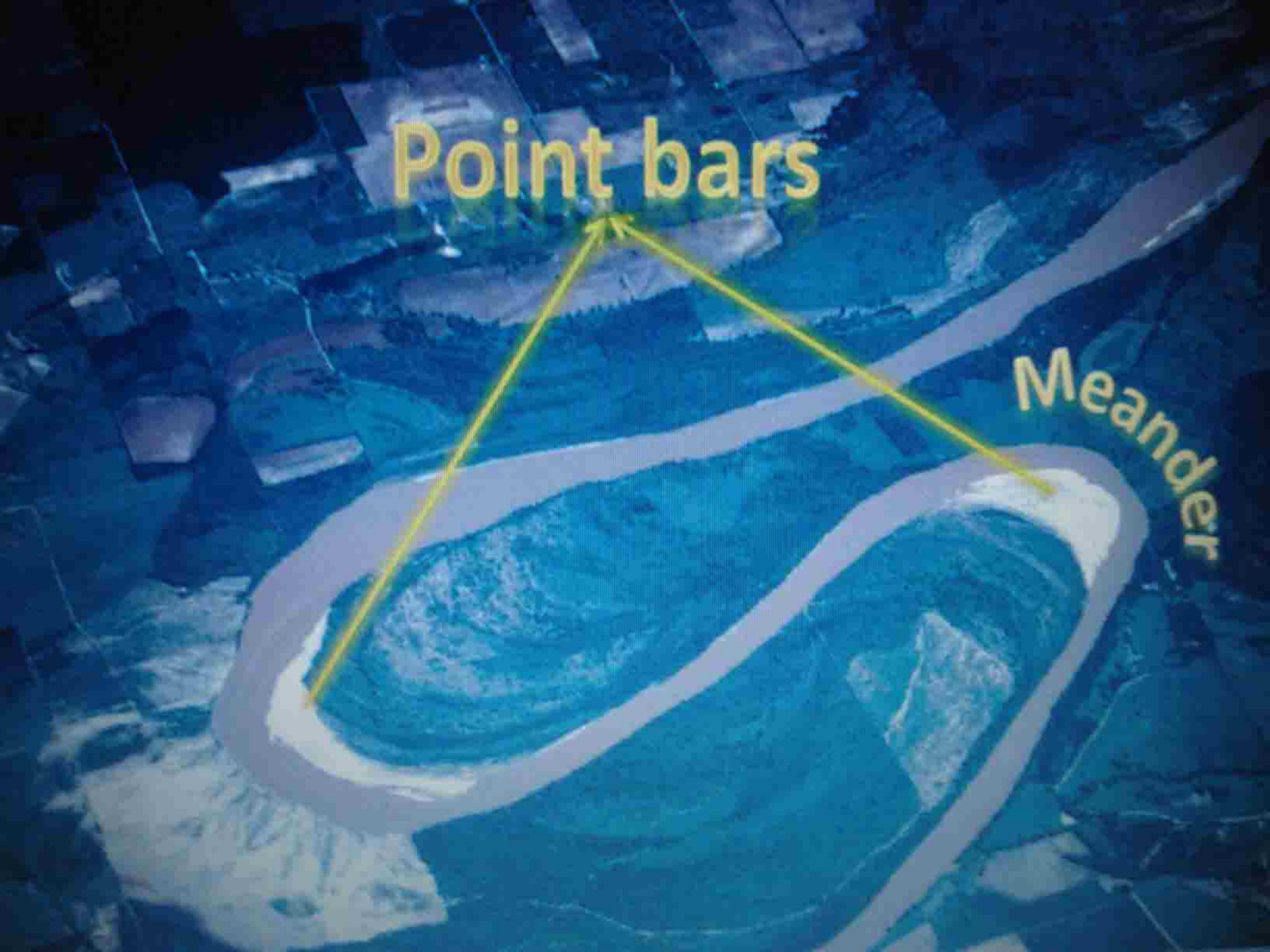
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Point bars

Meander



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- a. Point bars:** a crescent-shaped accumulation of sand and gravel deposited on the inside of a meander.
- b. Braided stream:** complex network of converging and diverging channels having an interwoven appearance. They often occur when the load of sediments supplied to a stream exceeds its competency or capacity.

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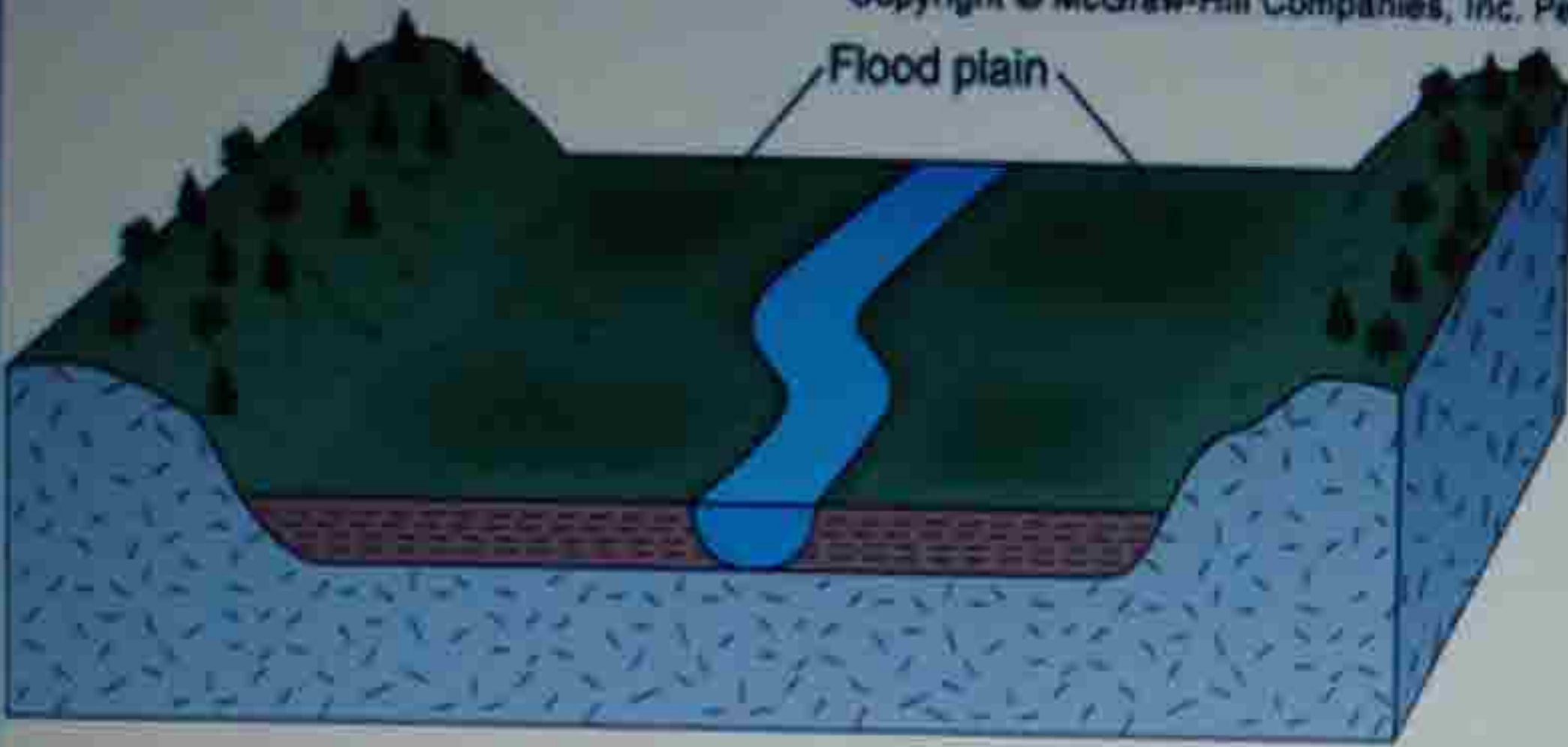
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Deposition of Sediment by Streams

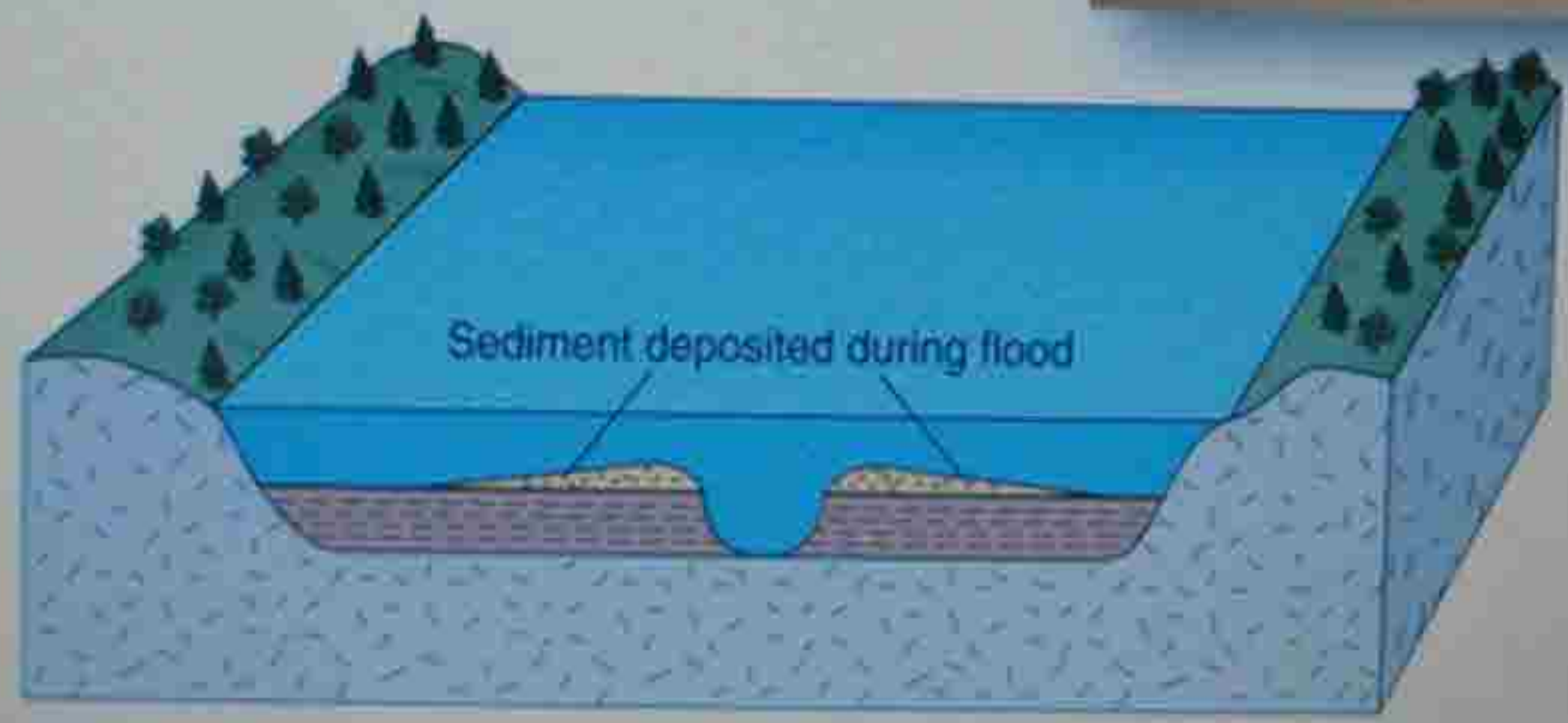
2. Floodplain deposits: the flat, low-lying portion of a stream valley subject to periodic inundation.

a. Natural levees: an elongate embankment compound of sand and silt and deposited along both banks of a river channel during times of flood.

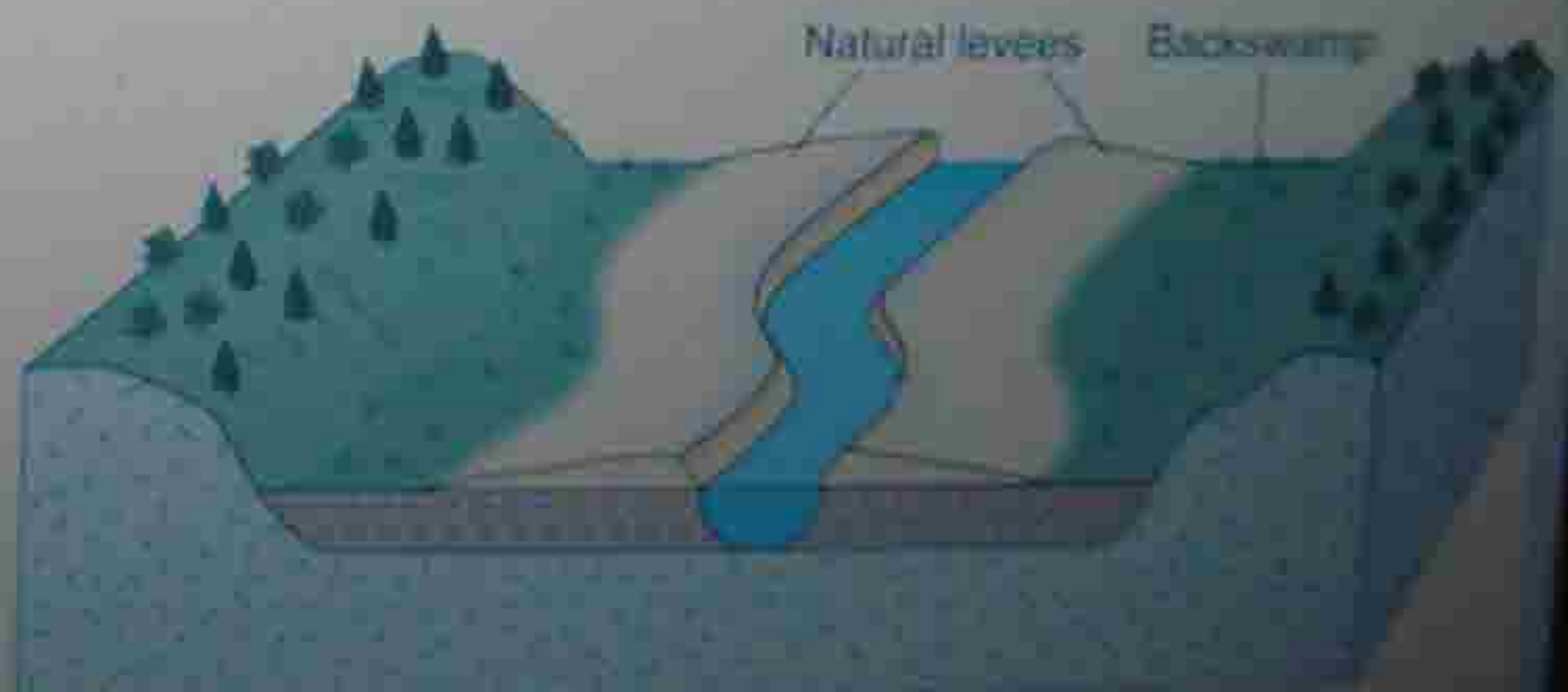
b. Back swamp: a poorly drained area on a floodplain resulting when natural levees are present.



A

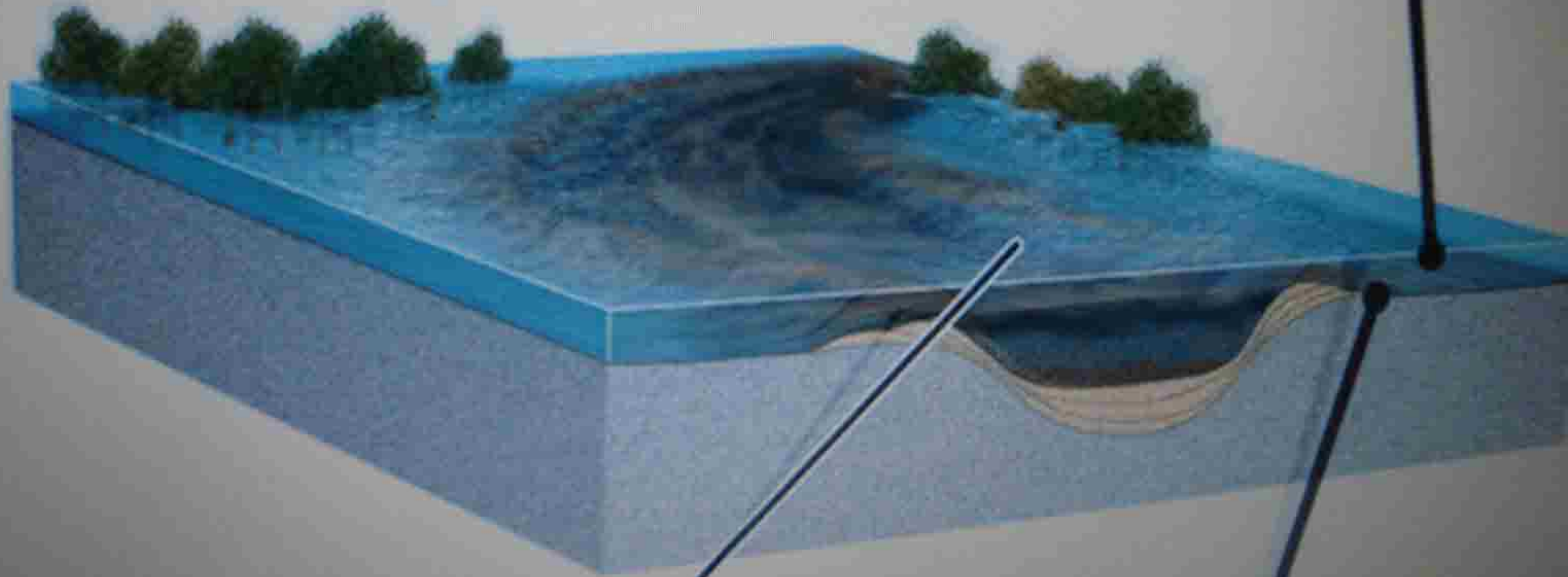


B



During flood

After many floods

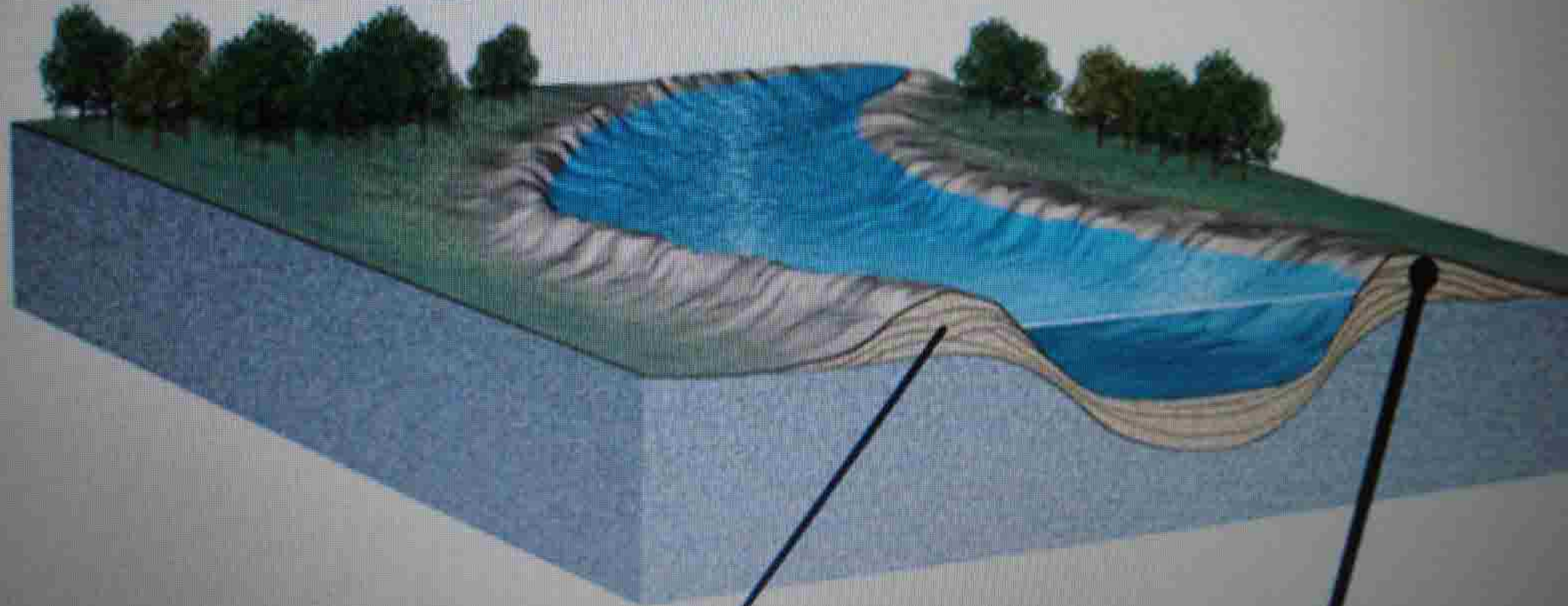


Sediment-laden
floodwater

3

2

After many floods



Natural levee

Deposition of Sediment by Streams

- 3. Alluvial fans:** fan-shaped deposits formed where fast flowing stream flattens, slows and spreads typically at the exit of a canyon onto a flatter plain.
- 4. Delta:** an accumulation of sediment formed where a stream enters a lake or an ocean.
- 5. Oxbow lakes:** a curved lake produced when a stream cuts off a meander.

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