

Water Quality - Importance and Regulatory Settings

Part B: Water Types

The material presented here has been prepared by Samuel Addison in April 2021, with input from Dr. Laura Richards and Prof. David Polya of the Department of Earth & Environmental Sciences, The University of Manchester, and other sources as acknowledged. The associated video recordings have been made by Samuel Addison.

The Transformation by Innovation in Distance Education (TIDE) project is enhancing distance learning in Myanmar by building the capacity of Higher Education staff and students, enhancing programmes of study, and strengthening systems that support Higher Educational Institutions in Myanmar. TIDE is part of the UK-Aid-funded Strategic Partnerships for Higher Education Innovation and Reform (SPHEIR) programme (www.spheir.org.uk). SPHEIR is managed on behalf of FCDO by a consortium led by the British Council that includes PwC and Universities UK International. The TIDE project will close in May 2021.



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 - Objectives
 - Distribution of water
 - Surface and ground water
 - Water type and composition
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- Summary

This lesson will investigate the distribution of water on Earth, and describe the various types of water.

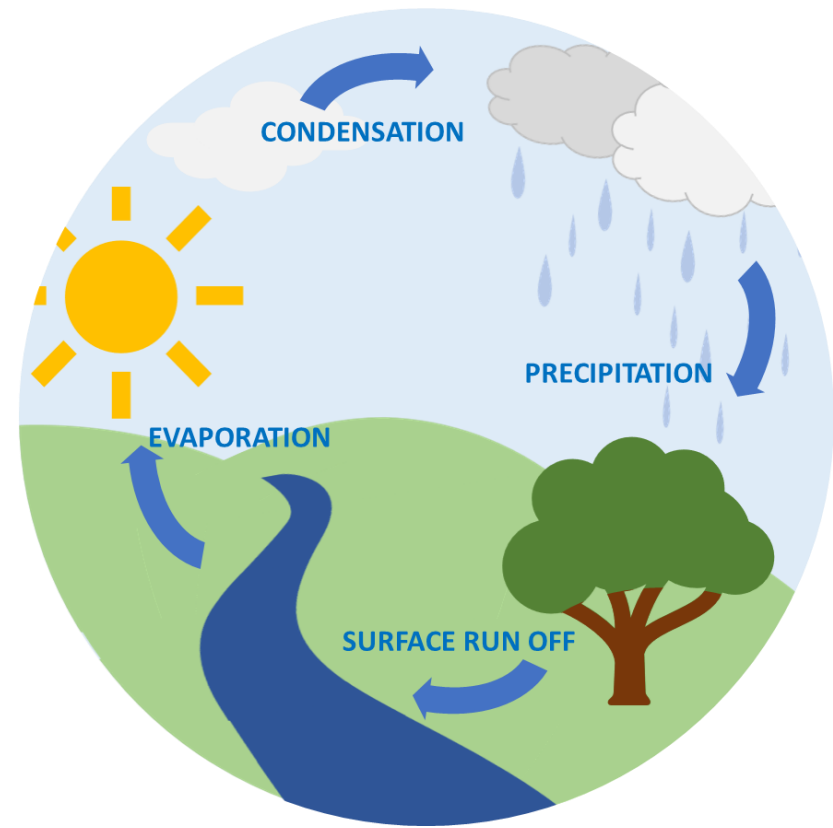
This lesson will build on knowledge learnt in “Water Quality - Importance and Regulatory Settings - Part A: Water quality - definitions and importance”

- To be able to discuss how water is distributed across Earth
- To be able to classify different water types
- To be able to compare the different types of water

DISTRIBUTION OF WATER

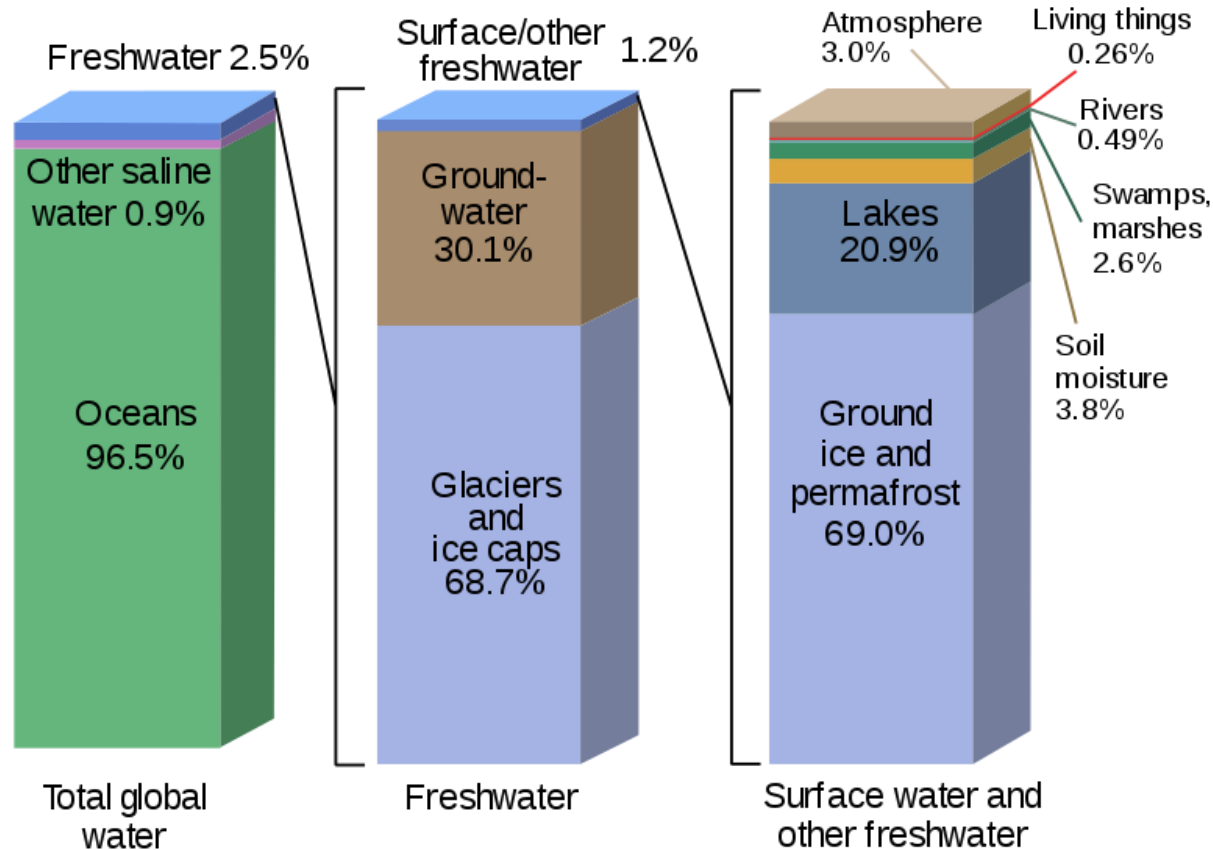
Water cycle

- Water is continually moving through the water cycle and changing form.
- Depending on where water is within the cycle, it changes the type of water it is.



Water type distribution

Where is Earth's Water?



- Fresh water is not distributed evenly over the globe, shown as fewer than 10 countries possess 60% of the world's available freshwater supply

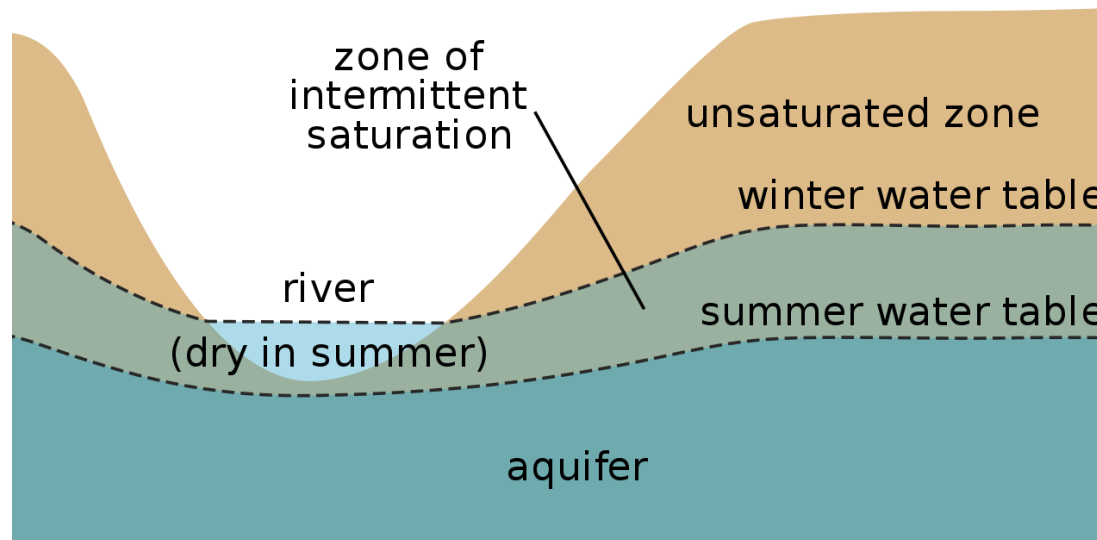


WATER TYPES

- Surface water is any water that is on ground level
- Surface water includes lakes, rivers, streams, oceans and wetlands.
- The majority of surface water is produced by precipitation and water run off.

- Groundwater is the water beneath the surface of the ground
- Groundwater is sometimes stored in aquifers where the subsurface is saturated with water
- Aquifers can vary with depth, and connectivity to the surface layers and surface water

- Ground water largely consists of surface water that has seeped down through the soil, however...
- There are many ways in which groundwater and surface water can interact.



WATER TYPE AND COMPOSITION

- Different types of water will have different compositions
- Differences are caused by water types being exposed to different environments
- Rainwater will change composition as it becomes surface or ground water, as it will go through many processes whilst on the Earth surface

- There are key typical differences between the processes in groundwater and surface water
- Whilst rivers may contain high concentrations of solid particles in suspension, groundwater generally has lower concentration.
- However, groundwater may have a higher amount of dissolved substances.

- The distinction between surface water and groundwater may not be that simple however.
- Groundwaters and/or surface waters can vary significantly
- Depth controls are also very important in groundwater, with shallow groundwater often most heavily influenced by ingress from surface water

- The processes discussed change the composition of water.
- This also means that they will also effect the contamination of water
- The processes therefore are important to understand, to be able to understand the contamination and quality of water

SUMMARY

- Distribution of water on Earth is not even
- Ground water and surface water have different key properties, which will impact their composition differently
- Groundwater and surface water often interact however, which adds to the difficulty of understanding their properties

LEARNING EXERCISE

- Think about the water that you may use for example for drinking or cooking with.
 - Where does the water come from?
 - Is it from a groundwater source or surface water
 - Think about how your water source may link to the water cycle and other processes talked about in this lesson.

REFERENCES & FURTHER RESOURCES

WBCSD, 2009. Facts and trends Water Version 2. Accessible at <http://docs.wbcsd.org/2005/08/WaterFactsAndTrends.pdf> (Last accessed 05/05/21)

Open learn- Understanding water quality. Accessible at: <https://www.open.edu/openlearn/nature-environment/environmental-studies/understanding-water-quality/content-section-0?intro=1> (Last accessed 05/05/21)

SSWM University Course - Module 1: Sustainability in Relation to Water and Sanitation. Accessible at <https://sswm.info/index.php/sswm-university-course/module-1-sustainability-relation-water-and-sanitation/course-material/-lecture-1%3A-introduction-to-sustainable-sanitation> (Last accessed 05/05/21)

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