

# ARCTIC HYDROLOGY

## Introduction

Water in the Arctic that either fell as rain or melted from snow and ice, flows via different paths before reaching the ocean.

The flow of water in rivers in the Arctic has a seasonal character. During late autumn, winter and early spring, most Arctic rivers freeze. There is a typical large variation of flow of water during ablation season, with very high discharge during the snowmelt and decreases during summer. Runoff regime and hydrological processes shape the landscape and influence the dynamics of glaciers. Groundwater movement in permafrost terrain is limited, cause frozen soil is practically impermeable. Above the permafrost is the active layer which freezes in winter but thaws in summer, allowing infiltration and groundwater recharge.

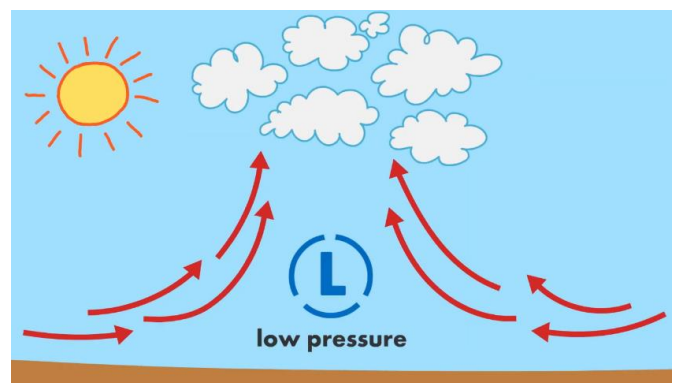
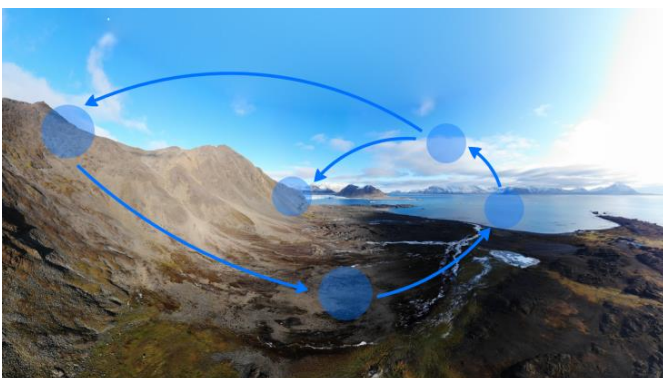
The water cycle shows the continuous movement of water within the Earth and atmosphere. It is a complex system that includes many different processes. Liquid water evaporates into water vapor, condenses to form clouds, and precipitates back to Earth in the form of rain and snow. Water in different phases moves through the atmosphere (transportation). Liquid water flows across land (runoff), into the ground (infiltration and percolation), and through the ground (groundwater). Groundwater moves into plants (plant uptake) and evaporates from plants into the atmosphere (transpiration). Solid ice and snow can turn directly into gas (sublimation). The opposite can also take place when water vapor becomes solid (deposition).

Looking at our Earth from space, it is obvious that we live on a water planet. Ocean covers over 70% of Earth's surface and contains about 97% of Earth's surface water.

**Task 1.** Name the frames.

**A.** condensation **B.** water storage in ice and snow **C.** surface and subsurface runoff **D.** evaporation **E.** precipitation

**Task 2.** Clouds are made of water or ice crystals. Describe formation of clouds.



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**Task 3. Name:**

A – englacial stream

B – supraglacial stream

C – subglacial stream



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**Task 4. Name the frames:**

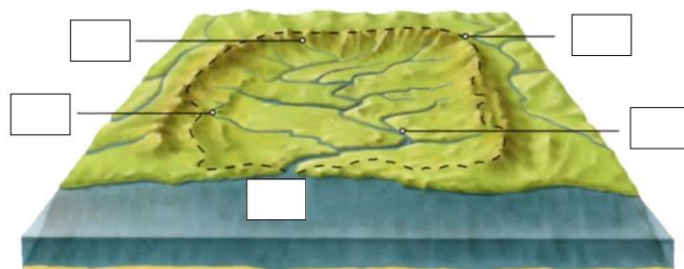
A – catchment boundary

D – river

B – river tributary

E – spring

C – outlet / estuary



**Task 5.** Describe changes in the water cycle in the Arctic.

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