

The science of hydrology and its branches

[Environment](#), [Water](#)



“ Glacial hydrology is the study of the flow of water through glaciers.” Water flow at the meeting of two ice-beds which has important implications for glacier flow. Spread throughout the glacier ice is a “ network of microscopic veins and lenses of water. “ The rate of filtration of water throughout the glacier depends salinity, pressure and temperature. Meltwater only filters through the glacier at a very, very slow pace and only differs “ in the rate at which it is able to seep through the ice results in ponded water within and beneath the ice sheet. The rate at which ice seeps through the ice, however, is so slow, that for practical reasons ice can generally be considered impermeable” (not allowing fluid to pass through).

Supraglacial hydrology (supraglacial is surface water on a glacier) is formed by the melting ice that flows off the glacier and creating channels that have many curves and turns. The water in these channels can flow at up to a rate of several metres per second. Surface melt occurs in the tightly packed snow and can pond above the impermeable ice. If the snow is completely saturated into the surface, it becomes a ‘ swamp zone’ with puddles of standing water. “ The swamp zone moves up glacier as the melt season progresses. The surface drains increasingly quickly as more ice is exposed, and the firn is filled with water.” Saturated snow on ice shelves could contribute/cause the shelves to collapse.

Englacial hydrology are structures produced by tension in the ice that allow for water to penetrate into the ice. Water falls down vertical sheets of ice that had been created by previous water, onto ice sheets. Numerous pockets of water can stay trapped in glaciers and temperate ice sheets for a period of time. Subglacial hydrology is when basal (base) water flows through large

subglacial networks and impacts glacial erosion and ice velocity. The networks can be hundreds of kilometers long. “ Meltwater reaches the base of ice sheets through basal melting from geothermal heating and by ice melting under pressure from the weight of the ice mass above. Secondly, downwards percolation and flow of supraglacial and englacial systems.

There are several main aspects of the basal hydrological system. Firstly, water can be ponded in subglacial lakes. It can also flow through subglacial channels. R-Channels are incised upwards into the ice. Channels can also be incised into the bedrock or subglacial sediments (Nye channels).” Proglacial drainage “ The proglacial area of temperate glaciers is characterised by abundant meltwater runoff from the glacier. Often, this becomes impounded in the overdeepened glacier basin as a proglacial lake. Abundant meltwater can form large braided river plains.” The streams redeposit glacial sediments and rework glacial landforms as they move.

Source:

1. [http://www. antarcticglaciers. org/modern-glaciers/glacier-hydrology/](http://www.antarcticglaciers.org/modern-glaciers/glacier-hydrology/)