Popular Scientific Summary

Groundwater is known as water underneath the earth's surface, in the zone of saturation in geological formations known as aquifers. They store a large portion of the easily available fresh water, about 98% of fresh water on the earth. Surface water can be regarded as water that occurs on the earth's surface in liquid or solid form. Both surface water and groundwater play an important role to the environment and human life. Hence the quality of surface water and groundwater is crucial when it comes to their usage.

Lake Bolmen, twelfth of the largest lakes in Sweden, serves as drinking water source for the western region of Scania. There are many islands in the lake and the largest is Bolmsö Island. Water in this lake is gradually changing its color to brown color mainly due to the increasing of dissolved organic matter and iron which could have effects on the society and the environment. Finding the cause behind this color change is one of the important things that must be done to deal with this problem.

This master thesis investigates the impact of groundwater and surface water flow originating from Bolmsö Island to the water balance of Lake Bolmen. It has been possible to estimate the interaction between the groundwater and surface water at Bolmsö Island and make predictions about the groundwater flow and surface water flow regarding water browning inside Lake Bolmen.

There are many methods that can be used to find the interaction between the lake and the island. In this study MODFLOW within Groundwater Modeling System is the preferred method. It was used to simulate the amount of groundwater leaving Bolmsö Island to Lake Bolmen and helped to estimate the amount of surface runoff from the island to the lake.

This study indicated that groundwater and surface water flow from Bolmsö Island to Lake Bolmen and also showed that it is possible that this water may contain organic content origination from fens and bogs soils that are located in the island and could lead to water color changes in the lake. Further studies are required before the findings of this study can be implemented.