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Investigation of the groundwater potential in the Faroe Islands

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Abstract

Despite growing knowledge of the groundwater systems and the whereabouts of existing aquifers in the Faroe Islands today, groundwater is only being used in a limited amount, and a good understanding of groundwater flow does not exist. Conventional geophysical instruments such as resistivity measurements are challenging in the Faroe Islands due to the volcanic origin of the islands. Therefore other methods, such as tracer analysis, pumping tests and continuous measurements are the tools that can help to increase the knowledge of the groundwater systems.

The overall aim of this project is to initiate mapping of the groundwater systems operating in the Faroe Islands to get a better understanding and foundation for further sustainable usage of this relatively unknown resource. To this end, we aim to use a combination of data, measurements and analysis to be able to answer the following questions: (i) where are the reservoirs?, (ii) when and how is groundwater recharged? and (iii) what is the water quality? With this approach, we aim to separate fossil water from younger water making predictions on how much and for how long a certain aquifer can be sustainably used. Additionally, we will carefully test one aquifer in order to see how it responds to pumping. We will present what we have found on e.g. flow patterns, temperature change, conductivity change (saltwater intrusion) and nearby surface water reservoirs. Hopefully the insights of this study will serve as a foundation for decision making to increase the possibility of sustainable groundwater usage in the Faroe Islands, both when it comes to its use as an energy source as well as for drinking water.

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