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A novel method for estimating local rain as freshwater discharge from Faroese rivers into fjords

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Abstract

Previous studies of precipitation in the Faroe Islands mostly exists in “grey literature” such as Førland in 1986. This study concluded that the variation in precipitation is quite extreme even over limited distances. Here it was also stated, that if expansion of hydropower is a plan, more advanced rain measurements must be introduced. This was done in a report by Davidsen et al in 1994, that presented a rain map for the Faroe Islands with a linear dependency between topography and precipitation. Generally, one can say that the rain climate in the Faroe Islands is similar to the West coast of Scotland and the West coast of Norway. The Faroe Island has lower summer temperature and a greater number of days with precipitation in winter than the other two location. For this reason, our Islands need dedicated local studies.

This paper describes a QGIS based approach on estimating freshwater discharge from rivers based on rain measurements at point locations in the Faroe Islands, together with DSM data from 2 m resolved satellite data and rain transect data measurements over shorter periods in the Faroe Islands. The catchment area basin order is determined by the Strahler order introduced in 1957 by Arthur Strahler.

This study suggests a novel approach using Kriging, that introduces a map of rain variation and correlation to heights that significantly differs from the one presented in Davidsen et al 1994. We also find that the precipitation over the Faroe Islands is heavy and locally varies over short distances.

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