



Variability of precipitation in complex terrain and the investigation of representativeness of measurements for the Matre catchment area, Western Norway.

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Orography is strongly affecting precipitation. Especially over complex terrain, the precipitation fields can show high spatial variability even over very small scales. Along the Western coast of Norway with its large precipitation amounts of up to above 3000 mm per year, an improved understanding of the spatial precipitation patterns is of large socio-economic impact, as it can improve both the prediction of floods and landslides and the water management for hydro power plants.

The producers of hydroelectric power continuously want the water resources to be utilized in the best suited way. Control and supervision of the water resources are therefore of the utmost economic importance. To get an overview over the water resource situation, it is essential to know about the spatial and temporal distribution of precipitation. In cooperation with the Norwegian power company BKK, 20 HOBO rain gauges and two Aanderaa weather stations have been deployed between 22 and 898 meters above sea level in the catchment area for the Matre water system in Western Norway in the period May - October 2009. The main purpose of the project is to investigate the horizontal variability and the altitude dependence of precipitation in complex terrain under different synoptic conditions in this catchment area. Moreover, the representativeness of a few single point measurements on the total precipitation amount of the whole catchment area has been addressed.

The total amount of precipitation recorded by the 20 rain gauges during the deployment period ranges between 535 mm and 1190 mm, which indicate the large variability within the catchment area. Analysis of the data with respect to wind direction shows that 75 % of the total precipitation amount during the measurement period arrives when the wind direction is S - SW. During a high precipitation event, which will be investigated in more detail, amounts of precipitation between 58 mm - 121 mm within a 24-hour period have been observed during a frontal passage.