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# Preparing for heavier rainfall - Norwegian “climate factors”

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At last year’s EMS in Dublin, we presented a new interactive tool for extracting Intensity-Duration-Frequency (IDF) statistics at any location in Norway, based on station observations and high-resolution maps of precipitation return levels estimated from a Bayesian Hierarchical model. The new tool is available on the Norwegian Center for Climate Services (NCCS) websites (https://klimaservicesenteret.no/faces/desktop/idf.xhtml). IDF values are frequently used in the design of urban water management systems, roads and railways, and other important infrastructure.

There are several challenges associated with the estimation of IDF values for precipitation, one of them being the changing climate. Traditionally, infrastructure in Norway is designed to handle a precipitation event of a certain duration and return period based on historical gauge observations. As climate projections indicate an increase in precipitation over our region, we need to account for this increase when building new infrastructure.

To assist decision-makers in the process of climate adaptation, we estimate precipitation “climate factors”; the factor by which to multiply current design values to get a measure for future design values. We have computed such climate factors for the durations 1, 3, 6, 12 and 24 hours based on 0.11° simulations from the EURO-CORDEX ensemble. As Norwegian authorities recommend the precautionary principle when preparing for future climate, the high emission scenario rcp8.5 is used when computing climate factors.

Preliminary results show that climate factors increase with shorter durations and with longer return periods. This indicates that the more intense rainfall that will increase the most. For the 5-year return period we found a mean climate factor for Norway of 1.42 for hourly precipitation, while the factor is 1.26 for daily precipitation. There is some spatial variability, with higher climate factors in dryer areas such as the mountains and inland in Southern Norway, and in the far north.

The climate factors will be implemented through the IDF web-tool, to give the user an estimate of future IDF-statistics and thus a better basis for proper infrastructure design.