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Seasonal variations of Manning's coefficient depending on vegetation conditions in Tärnsjö, Sweden

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Hydrological modelling and water resources management require observations of high and low river flows. To estimate them, rating curves based on the characteristics of the river channel and floodplain are often used. Yet, multiple factors can cause uncertainties in rating curves, one of them being the variability of the Manning's roughness coefficient due to seasonal changes of vegetation. Determining this uncertainty has been a challenge, and depending on vegetation conditions on a stream, values can temporarily show an important deviation from the calibrated rating curve, enhancing the importance to understand changes in Manning's roughness coefficient. Examining the aquatic vegetation on the site throughout different seasonal conditions allows one to observe changes within the channel. By depending on cyclical changes in Manning's roughness coefficient values, different discharges may correspond to the same stage conditions. In this context, we present a combination of field work and modelling exercise to the variation of the rating curve due to vegetation changes in a Swedish stream.