Evaporation from a large lowland reservoir – a multi-model assessment and a long-term measurement campaign

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In the past, studies on open water evaporation (E_{water}) have mainly focussed on simulating and parameterizing E_{water} on weekly timescales and coarser. However, the diurnal cycle of E_{water} and accompanying driving processes have remained largely underexplored. Commonly used evaporation methods might therefore produce somewhat realistic values at longer timescales, but fail on shorter timescales because the indirect controlling variables are used. This also questions whether traditional methods are able to reflect on future changes in E_{water} correctly. Therefore, we performed a systematic comparison of six methods that are sensitive to different forcings to evaluate their capacity to simulate E_{water} and capture trends in a changing climate.

Accurate observations of E_{water} at high temporal resolution are needed to uncover the controlling variables of E_{water}. For this purpose we started a long-term measurement campaign in September 2018 at lake IJsselmeer, The Netherlands, where we measure various meteorological variables and E_{water} using eddy covariance. In the spring of 2019 the campaign will be extended with scintillometers, using the two-wavelength method. This thorough long-term monitoring provides the opportunity to study the dynamics of sub-daily E_{water} throughout the year. At the EGU conference we present the first results arising from the measurement campaign.

The skin temperature of the water surface is considered an important predictor to estimate E_{water}. Therefore, we use the water surface temperature product from the SENTINEL-3 satellite to enable us to extrapolate the *in-situ* observations towards spatially distributed rates of E_{water}. This will reveal its spatio-temporal variability and with that it equips us with a more accurate estimation of the total water losses of the lake through evaporation, which provides valuable information for operational water management.