Estimating latent heat flux using a nonparametric method

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Liu et al. (2012) proposed a nonparametric approach to estimate latent and sensible heat fluxes. In this study, we evaluated this nonparametric approach with in-situ flux measurements. The experimental sites are located in a grassland pasture (Dripsey, Ireland) and a peatland (Glencar, Ireland). Latent and sensible heat fluxes, net radiant, air temperature, surface temperature, and vapor pressure deficit were measured in these two sites.

Our results showed that flux predictions by the nonparametric approach and equilibrium evaporation equation were close and in good agreement with measurements. Both methods have minimum errors when the evaporation fraction was less than 0.6. Equilibrium evaporation equation predicted a better latent heat flux than nonparametric approach did when the evaporation fraction was greater than 0.6. On the contrary, nonparametric approach was better than equilibrium evaporation equation when evaporation fraction was less than 0.6. In all the input parameters, air and surface temperatures were the two important factors in the nonparametric approach.