



Lake Taihu eddy flux mesonet for atmospheric and hydrological research

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Lakes play a unique role in global and regional carbon and water cycles. Information on the lake-air exchanges of energy, water vapor and CO₂ are important to numerical weather models and climate change study. So far lake parameterizations of lakes in numerical weather models have been ocean studies and there have been few studies on lake-air fluxes of greenhouse gases. As a robust flux measurement method, eddy covariance is widely employed in studies on terrestrial ecosystems. However, long-term eddy covariance applications are still rare for lake systems. In this paper, we describe an eddy flux mesonet over Lake Taihu. The lake is large (with area of 2400 km²) and shallow (with depth of 2m) and is situated in the Yangtze River Delta, East China. Five eddy covariance systems were installed on platforms located in the north, east, south, west and middle of the lake, representing different biological attributes and wind-wave patterns. An additional eddy covariance site was established on land. Supporting measurements include general meteorological variables, net radiation components and water temperature profile. To our best knowledge, this is the first lake eddy flux mesonet. The data obtained with the mesonet provide powerful constraints for the studies on the temporal and spatial patterns of radiation, energy and water balances, CO₂ exchange, and ecological characteristics of the lake and provide us opportunity to investigate the linkage between atmospheric and aquatic processes.