Understanding the condensation and evaporation of water from aerosol particles is critically important for quantifying the role of aerosol in the atmosphere. All cloud droplets start as aerosol nuclei on which water can condense. The rate of condensation determines the size distribution and number of cloud droplets, influencing the radiative balance of the atmosphere and precipitation patterns. Uncertainties in quantifying the formation of clouds from aerosol represent the largest single uncertainty in quantifying climate change. In this project, Davies developed a new laboratory instrument for measuring the rates of evaporation or condensation of water from aerosols on timescales from $<1\text{ s}$ for cloud droplets to $>1\text{ day}$ for viscous secondary organic aerosol. Using this approach it was possible to resolve a long-standing issue in predicting condensation rates and cloud droplet formation: with what probability do water molecules in the gas phase, when colliding with a water surface, condense. Previous determinations spanned from $<0.01$ to $1$. The value determined in this study definitively demonstrated that the probability is larger than $0.5$. Further, Davies was able to demonstrate that organic surfactant films can reduce evaporation rates by many orders of magnitude and that ultraviscous aerosol can take many days to equilibrate in composition.