Water is the most abundant condensed phase species in the atmosphere (including in aerosols). It has a dramatic effect on radiative forcing and enables reactions that alter atmospheric composition. My group examined the potential for water-soluble organic gases to be converted to organic aerosol through aqueous chemistry in clouds, fogs and wet aerosols. We contributed to chemical mechanisms used in global assessments, and expanded the recognition that liquid water must be considered to understand the chemistry, thermodynamics and impact of atmospheric organic aerosols. The increasing interest and intellectual engagement of others, improved analytical methods, controlled experiments, predictive modeling and use of tracers in field studies have driven a rapid advancement in understanding. Within this context, this talk examines insights into the impacts of water on water-soluble gases in ambient air, in a biomass burning plume, and in indoor residences in the Southeastern US. This work makes use of real-time measurements and experiments with ambient aqueous mixtures. Implications to exposure will be discussed.