Although the special properties of water have been valued and appreciated for centuries, as scientists we continue to be perplexed by the molecular make-up of water in all its forms. Equally perplexing is the surface of water, a surface that is involved in some of most important reactions in our atmosphere, a surface that can sculpt the landscape as it flows past rocks and soils, a surface that can break down the strongest of metals, and a surface across which essential nutrients and ions are constantly exchanged in life-sustaining processes in our bodies. In our laboratory we study environmentally important processes at aqueous surfaces using laser based spectroscopic techniques and molecular dynamics simulations. I will focus my talk on our recent studies of the intriguing behavior of water surfaces when in contact with molecules of importance in our environment.