We live in an era in which human activities substantially impact the environment on a global scale. In addition to the long-lived greenhouse gases, anthropogenic activities emit a multitude of species into the atmosphere, including volatile organic compounds (VOCs), nitrogen oxides (NOx), sulfur dioxides (SO2), organic aerosol (OA), etc. These trace species undergo complex chemical reactions, control the atmospheric composition, deteriorate air quality, and alter climate. Because of strict regulations of emissions from power plants and vehicles, the air quality across the US has substantially improved over the last several decades. However, the progress on air quality has stalled in many US cities in recent years. It is puzzling why air quality policies are not working as effectively as they used to. In this presentation, I will discuss some emerging challenges to continue improving air quality, which include air pollution from vegetation emissions, wildfires, and traditionally overlooked emissions. Moreover, I will discuss how an integrated approach, combining laboratory studies, field measurements, instrument development, and atmospheric modeling, is critical to unravel the causes of air quality issues.