Abstract

Stratospheric ozone depletion and climate change are two of the most important environmental issues of our time. Both derive from human activities that have changed the composition and other properties of Earth’s atmosphere. Stratospheric ozone depletion, which includes the Antarctic ozone hole, is caused by emissions of ozone depleting substances (ODSs). The 1987 Montreal Protocol on Substances that Deplete the Ozone Layer is a landmark agreement that has successfully reduced global ODS emissions. Less widely known is the fact that ODSs are greenhouse gases that contribute to the radiative forcing of climate change. The accumulation of aerosols in the atmosphere also contributes to climate change. Of particular importance are those containing elemental black carbon because they absorb solar radiation. Black carbon is the third most important component of human-induced climate change after carbon dioxide and methane.

My career since leaving the UMR Physics Department has been spent as an experimental atmospheric scientist contributing to our understanding of these issues. In this presentation, I will briefly discuss the success of the Montreal Protocol in protecting the ozone layer and climate, and some results from the recent international assessment of climate science. I will intersperse results from my research group concerning the discovery of large particles in the Arctic winter stratosphere and measurements of black carbon aerosol in the troposphere and lower stratosphere.