ABSTRACT

From the perspective of humanity, ozone in the atmosphere has something of a “split personality.” We absolutely need ozone in the stratosphere, above about 10 km in height. Here, it absorbs dangerous ultra-violet light from the sun, and protects us from cancers and DNA damage. But ozone also exists in the troposphere, and here it is a noxious pollutant. It causes eye irritation, asthma, bronchitis, and stunts crop growth. It is a major component of photochemical smog.

Scientists have measured ozone for many years, using both ground-based instruments and satellites. One very important instrument is the ozonesonde—a small instrument launched on a weather balloon along with a standard temperature-moisture-pressure ("P-T-U") sensor. It measures the amount of atmospheric ozone from the surface, through the troposphere, and into the middle stratosphere (~35 km altitude). The recent deployment of strategically-designed ozonesonde networks has revolutionized sampling in the UT/LS (upper troposphere-lower stratosphere)—that part of the atmosphere where interactions between ozone change and climate come together.