Anthropogenic increases of carbon dioxide are predicted to lead to warming trends in the troposphere and cooling trends in the stratosphere. Ozone recovery following the Montreal protocol which banned ozone destroying chemicals, is expected to lead to a warming of the stratosphere. CrIS observed BT are proposed for monitoring stratospheric temperature trends. The global natural variability is less than 0.1 K, which implies a time to detect of about 10 years.

The figures on the right depict the combined ozone value over a time series of ~4 years, as well as the atmospheric temperature over the same time period. In the summer months, when the temperature is hotter, the tropopause altitude (black line) increases in height noticeably in the mid latitude zones due to the fact that the sun is shining on that area year round. There is also little to no variability ~55 degrees due to the fact that there are no large land masses present in that area.

As the tropopause altitude increases, it is observed that the ozone concentration in the lower stratosphere decreases. This is seen predominately in the mid latitude zones during the summer months.

Analysis of coincident CrIS and OMPS data shows a higher correlation of BT and ozone for the upper stratosphere (excluding the tropics). Little correlation was seen in the lower stratosphere.

Analysis of coincident CrIS BT and atmospheric temperature shows a high correlation for the upper stratosphere. Less correlation is seen in the lower stratosphere.

Additional investigation is required to obtain a complete understanding of the role of ozone and carbon dioxide in regards to future trends in stratospheric temperature.