

# The Hourly GOES Sounder Total Column Ozone Derived Product

Ozone is a crucial atmospheric gas, and not just because of the “ozone hole.” Ozone data are increasingly part of the forecast process. Assimilation of ozone observations into forecast models can benefit forecasts of ultraviolet indices and air quality. Because ozone is a tracer of stratospheric air, ozone data can also be used to diagnose regions of stratosphere-troposphere transport associated with mid-latitude cyclones and clear-air turbulence.

Since 1998, an experimental derived total column ozone (TCO) product has been derived from GOES sounder hourly radiances. This approach initially produced a large bias, however, and as such use of this product in numerical models has been limited. Li et al. (2007) reported on recent improvements to the GOES TCO product. Resolution was improved to approximately 10 km by 10 km from 30 km by 30 km, and the bias was virtually eliminated by applying a correction function based on time of year and latitude.

An example of the improved GOES TCO product from 12 February 2006 is shown below. On this day, a deep upper-level trough over the central United States was well resolved by the GOES TCO product. The tightest gradients of total column ozone are typically co-located with tropopause folds. These folds, in turn, are sometimes associated with high surface winds and/or extraordinarily low surface relative humidities (<http://cimss.ssec.wisc.edu/goes/misc/990329.html>). For this particular storm system, good agreement was found between the GOES TCO and ozone observations from the hyperspectral Ozone Monitoring Instrument (OMI) onboard the Earth Observing System Aura platform. The advantage of the GOES product is that it provides high resolution geostationary coverage during both day and night, whereas OMI circles the globe and senses ozone only during the day.

As a new and improved remote sensing tool, the GOES TCO product’s operational uses are not yet fully explored. Its hourly updates and mesoscale resolution encourage new forecast applications on short time and space scales. This product is available in real time at: [http://cimss.ssec.wisc.edu/goes/rt/viewdata.php?product=o3\\_us](http://cimss.ssec.wisc.edu/goes/rt/viewdata.php?product=o3_us). For comparison, OMI ozone products can be found at [http://jwocky.gsfc.nasa.gov/ozone/ozone\\_v8.html](http://jwocky.gsfc.nasa.gov/ozone/ozone_v8.html).

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Li, J., J. Li, C.C. Schmidt, J.P. Nelson III, and T.J. Schmit, 2007: High temporal resolution GOES sounder single field of view ozone improvements. *Geophysical Research Letters*, 34, L01804, doi:10.1029/2006GL028172

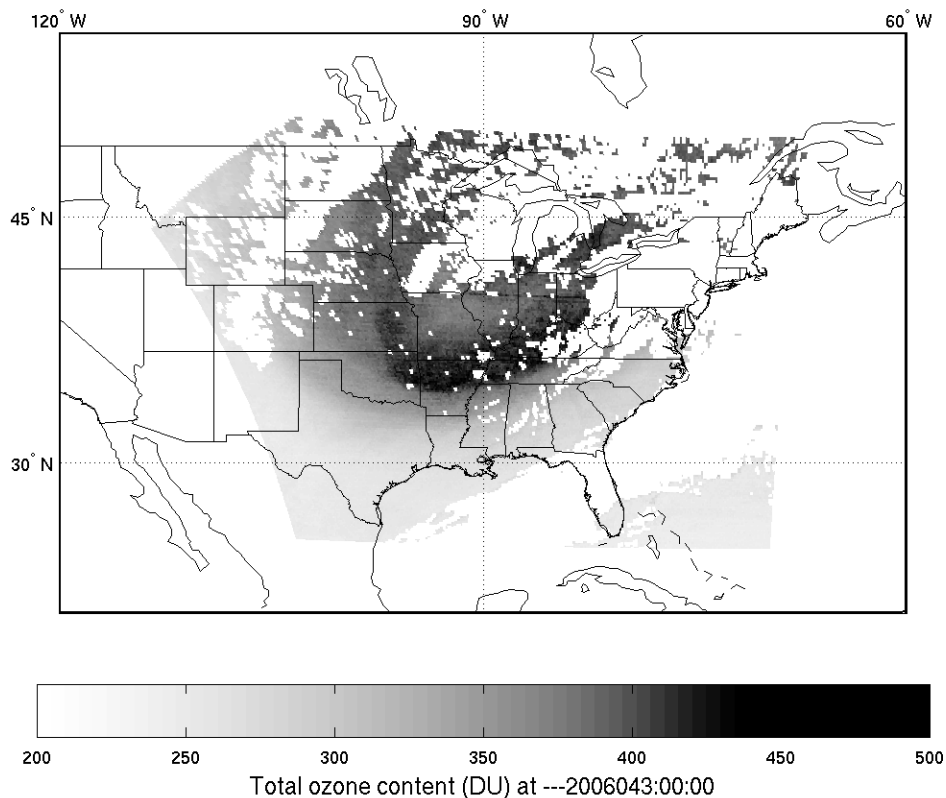


Image courtesy of Chris Schmidt, Cooperative Institute for Meteorological Satellite Studies, Space Science Engineering Center, University of Wisconsin-Madison.