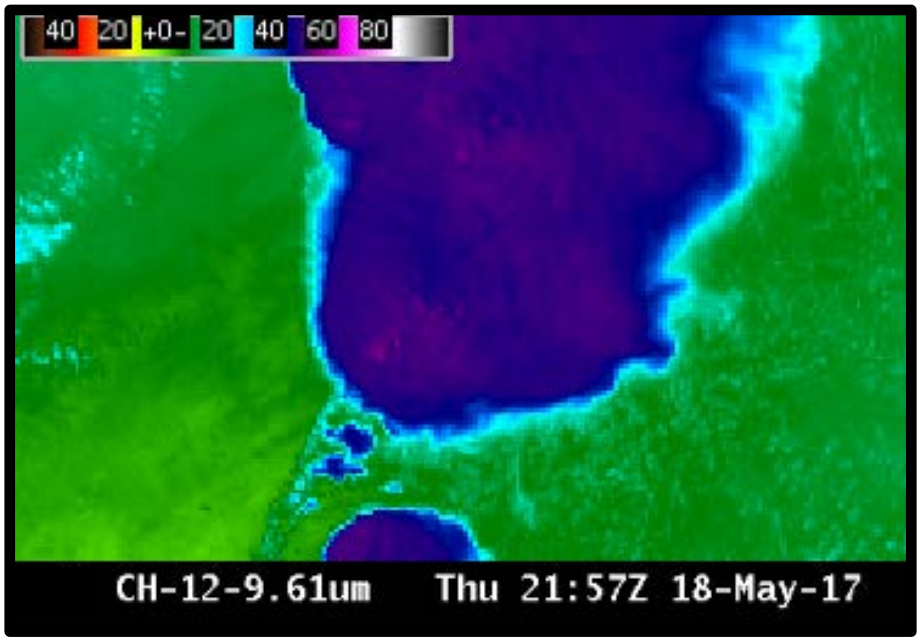
ABI Band 12 (9.6 µm)

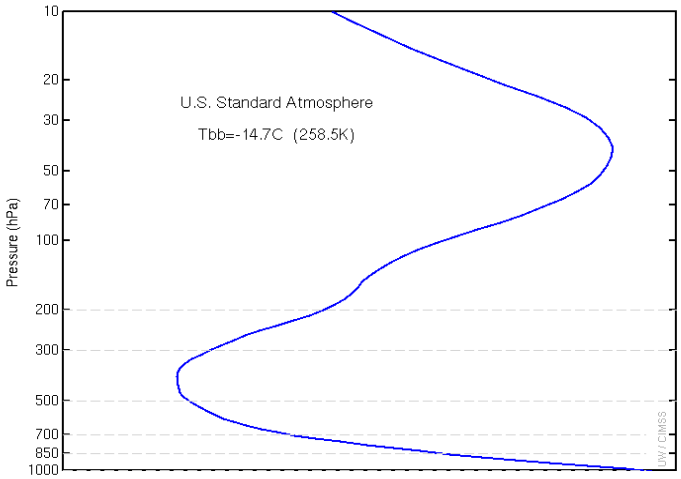
Quick Guide

Why is the Ozone Band Important?

The 9.6 µm band gives information both day and night about the dynamics of the atmosphere near the tropopause. This band shows cooler temperatures than the clean window band because both ozone and water vapor absorb 9.6 µm atmospheric energy. The cooling effect is especially apparent at large zenith angles. This band alone cannot diagnose total column ozone: product generation using other bands will be necessary for that.



The clear-sky Weighting Function for this band, shown in right as the blue line, has peaks at the surface (a typical characteristic of bands that can view the surface) and in the stratosphere (where ozone is most common). Surface ozone cannot be detected by this channel because water vapor also absorbs atmospheric energy at 9.6 µm.



Impact on Operations

Primary Application: The Ozone Band is used in RGBs (it is a component of the Airmass RGB Product, for example) and in derived products (such as Legacy Atmospheric Profiles).

Limitations

Water vapor absorption occurs in this band, complicating the use of Band 12 (9.6 µm) because the horizontal distribution of ozone and water vapor varies across the globe. Brightness temperature will generally increase with less water vapor, less ozone, or with an increase in air temperature in the layer where water vapor or ozone occurs.

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Ozone Band

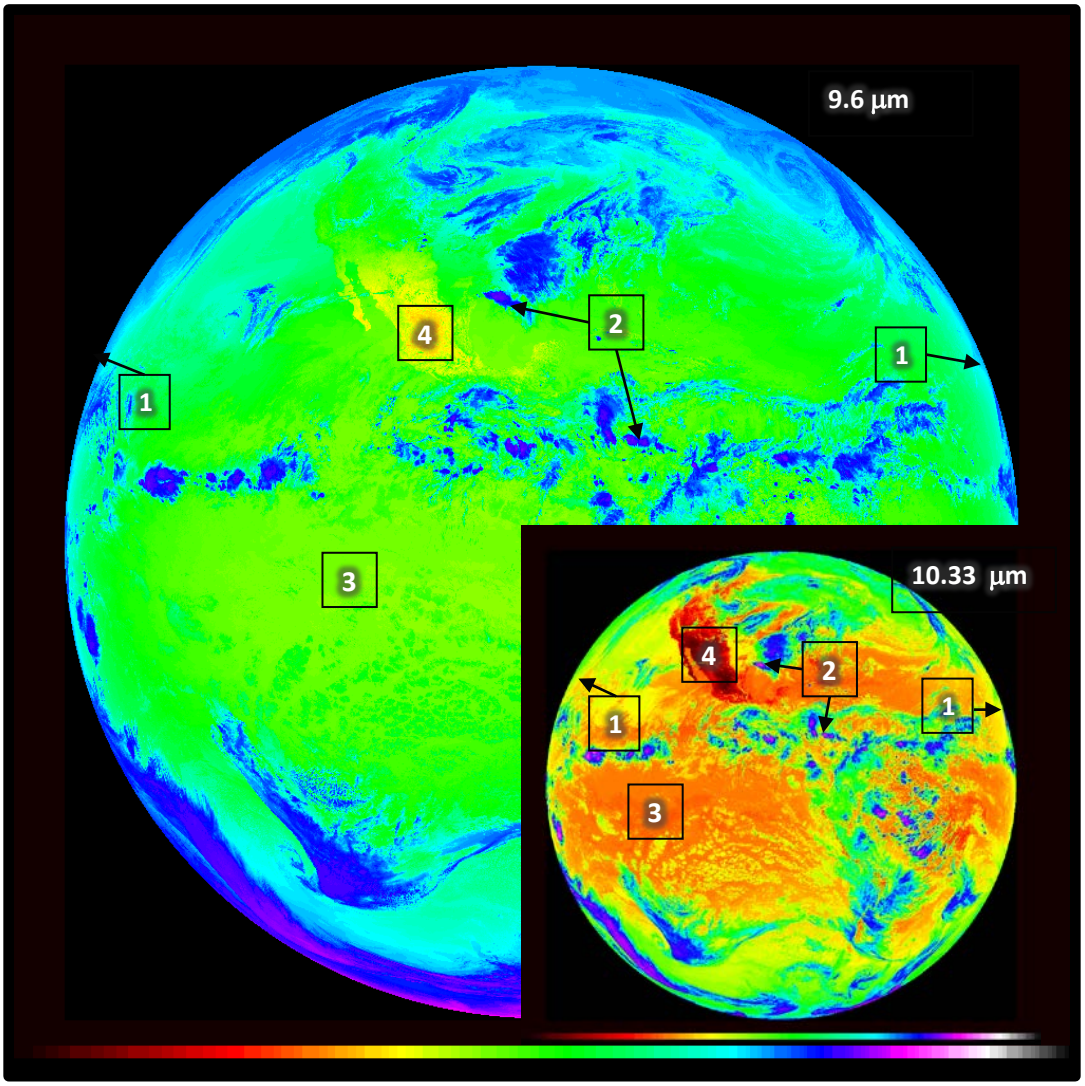
Satellite Image Interpretation

1 The Full-Disk Ozone shows cooling all around the edges.

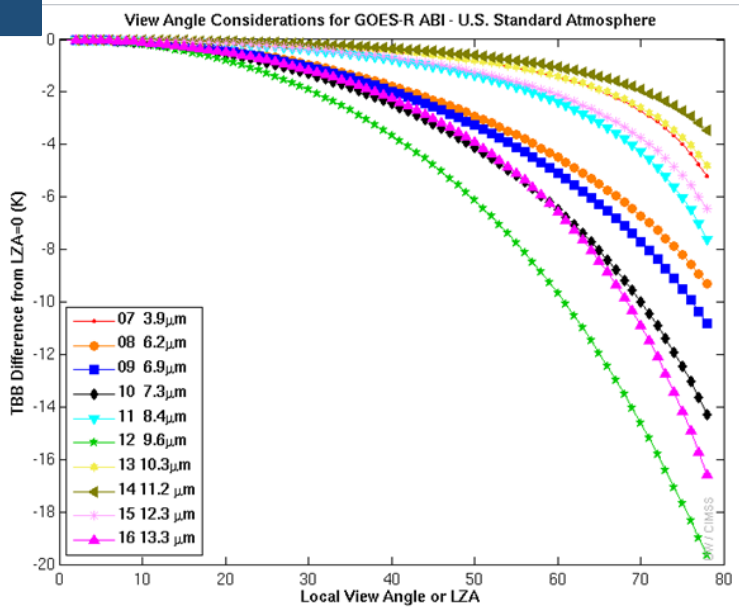
2 Brightness Temperatures over deep convection are warmer (blue enhancement) than in the window channel (purple enhancement) because of absorption by ozone in the warmer stratosphere

3 Band 12 Brightness Temperatures outside of deep convection are cooler (green enhancement) than in the window channel (yellow/orange enhancement) because of absorption by tropospheric water vapor and by stratospheric ozone

4 Surface features can be discerned. The Ozone Channel is a Window Channel



The 9.6 µm Band (the green line at right) shows the most cooling as you move farther from the sub-satellite point (relative to nadir views) for any ABI IR band.



Resources

BAMS Article

Schmit et al. 2017

GOES-R.GOV

Band 12 Fact Sheet

Quick Guide on Airmass RGB

Hyperlinks do not work in AWIPS but they do in VLab