



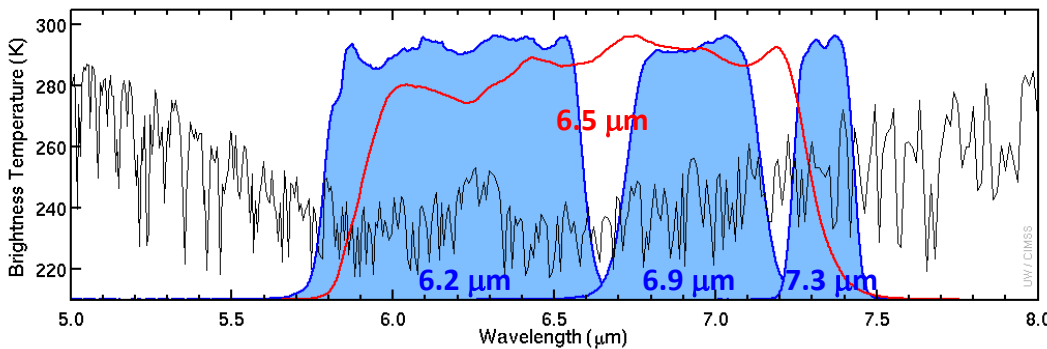
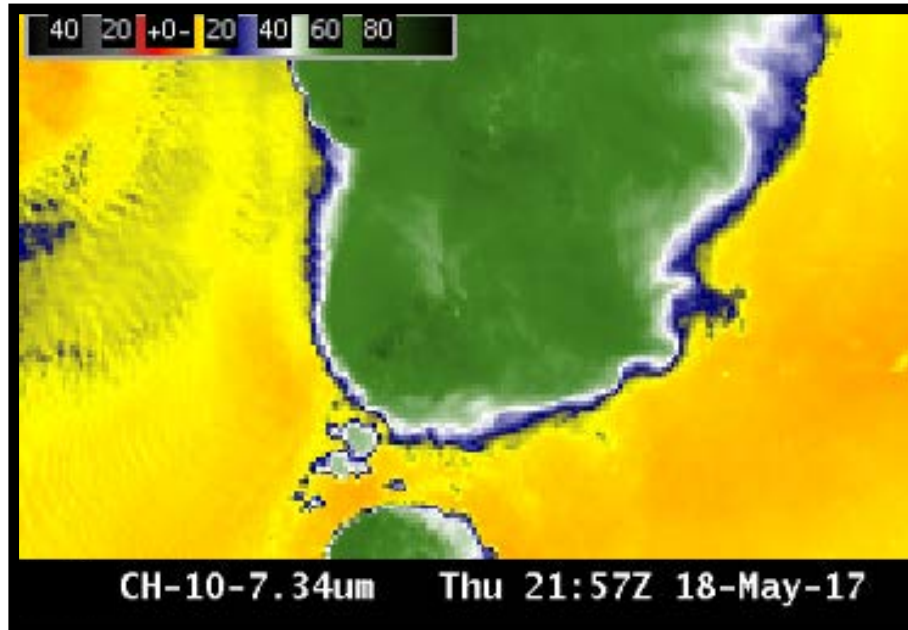
# ABI Band 10 (7.3 $\mu\text{m}$ )

## Quick Guide



### Why is “Lower-level water vapor” band imagery important?

The 7.3  $\mu\text{m}$  “Lower-level water vapor” band is one of three water vapor bands on the ABI. It typically senses farthest down into the mid-troposphere in cloud-free regions, to around 500-750 hPa. It is used to track lower-tropospheric winds, identify jet streaks, monitor severe weather potential, estimate lower-level moisture (for legacy vertical moisture profiles), identify regions where the potential for turbulence exists, highlight volcanic plumes that are rich in sulphur dioxide ( $\text{SO}_2$ ) and track Lake-Effect snow bands.

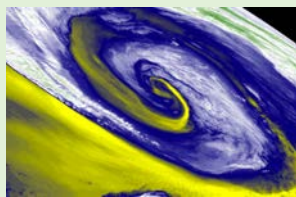


Left: U.S. Standard Atmosphere Earth-emitted temperatures and spectral responses for **ABI** and **GOES-13** Water Vapor Channels. The Legacy channel (6.5  $\mu\text{m}$ ) covers much of the 6.2  $\mu\text{m}$  and 6.9  $\mu\text{m}$  and 7.3  $\mu\text{m}$  bands on ABI (Figure: Mat Gunshor, CIMSS)

### Impact on Operations

#### Primary Application

Atmospheric feature identification (jet streaks, dry slots, signatures of potential turbulence, contrails, downslope winds., Lake Effect)



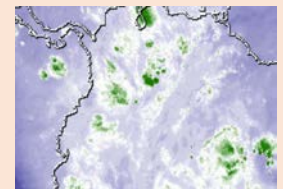
**Input into Baseline Products:** The 7.3  $\mu\text{m}$  imagery is used in the creation of Derived Motion Winds, the Cloud Mask, Stability Indices, Total Precipitable Water, Rain Rate, and Volcanic Ash products.

**Application:** Identification of volcanic plumes that have a high concentration of  $\text{SO}_2$ .

### Limitations

#### Regions of dense

**cloudiness:** The presence of optically-dense clouds obstructs the view of lower altitude moisture features.



**Interpretation of water vapor imagery:** The “water vapor” bands are technically infrared bands which sense the mean temperature of a layer of moisture — a layer whose altitude and depth can vary, depending on both the temperature/moisture profile of the atmospheric column and the satellite viewing angle. Water vapor weighting function plots may help you correctly interpret the three-dimensional aspects of patterns displayed on water vapor imagery. Band 8 and Band 9 Quick Guides contain simple plots.







# ABI Band 10 (7.3 $\mu\text{m}$ )

## Low-Level Water Vapor

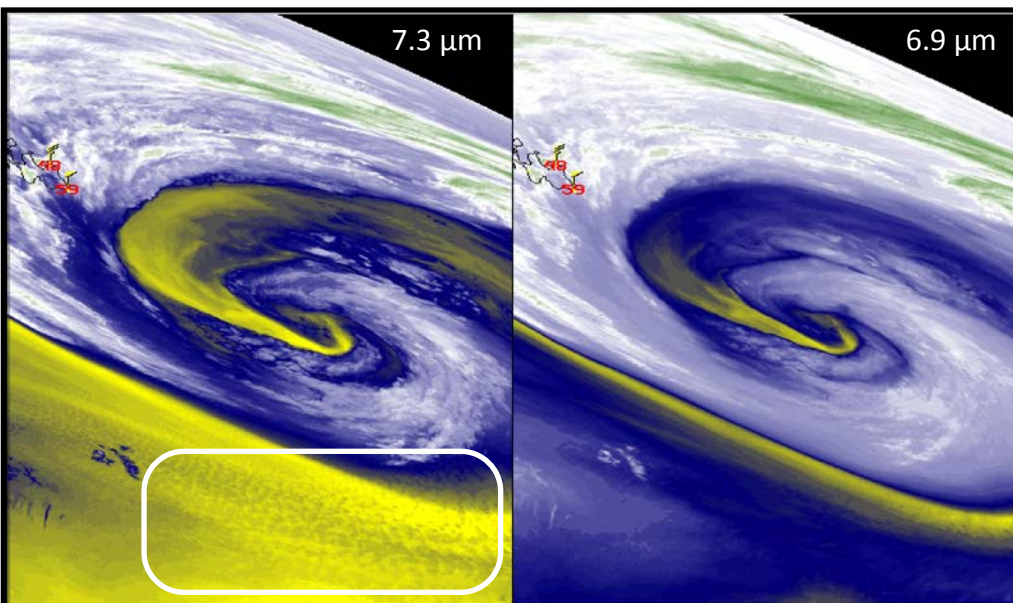
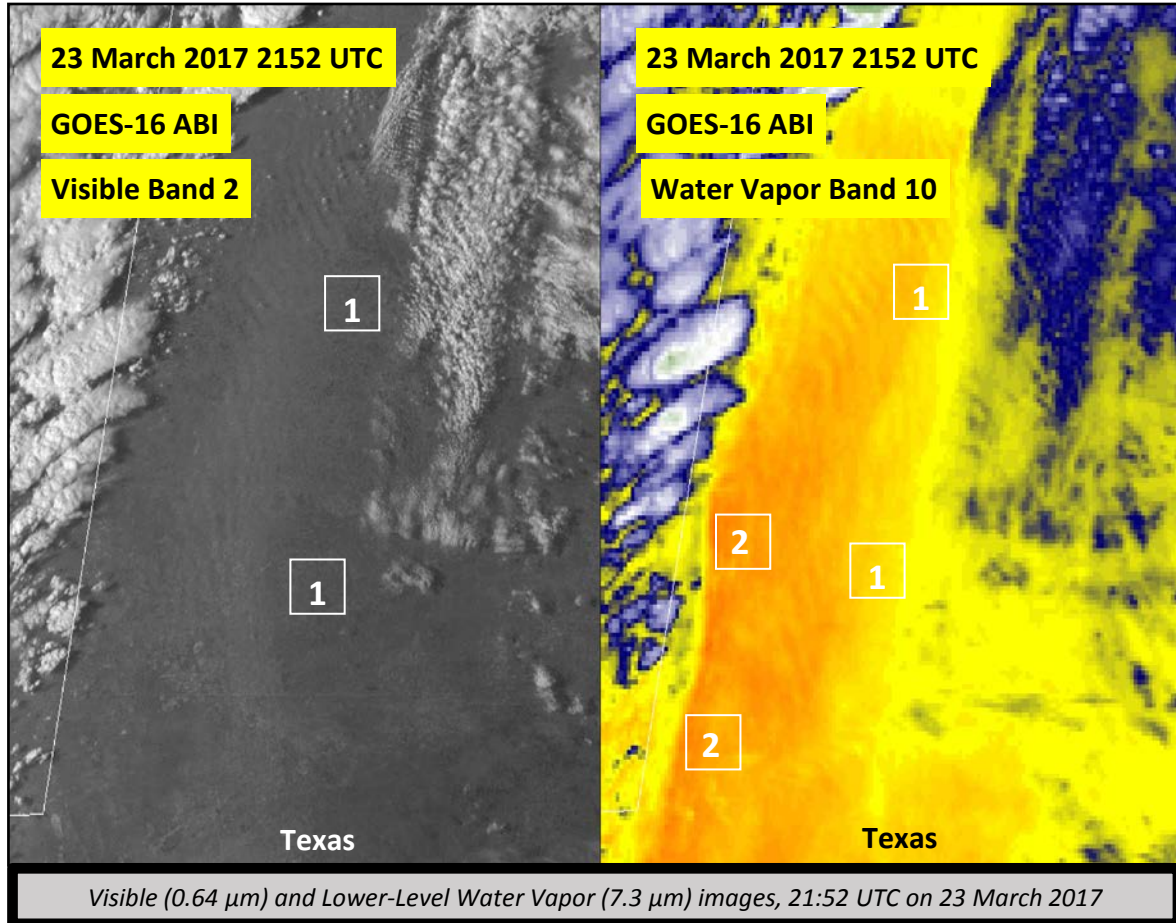


### Image Interpretation

1 Horizontal convective rolls

2 Dryline

To the east of the dryline oriented N-S along the Texas / New Mexico border, strong southerly winds caused blowing dust; plumes of lofted dust were organized into horizontal convective rolls aligned parallel to the wind flow



### Resources

BAMS Article  
[Schmit et al., 2017](#)

GOES-R.gov  
[ABI Band 10 Fact Sheet](#)

VISIT Satellite Chat  
[GOES-16 Water Vapor Band  
Orographic Applications](#)

[Hyperlinks do not work in  
AWIPS but they do in VLab](#)

The 7.3  $\mu\text{m}$  band can detect lower-level clouds when the middle/upper atmosphere is relatively dry— this example shows marine boundary layer stratocumulus over the Atlantic Ocean. (Credit: CIMSS)