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

The 7.3 µm “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-tropospheric moisture (for legacy vertical moisture profiles), identify regions where the potential for turbulence exists, highlight volcanic plumes that are rich in sulphur dioxide (SO₂) and track Lake-Effect snow bands.

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 µm 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 SO₂.

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.
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.