

Water Vapor Fields Via Multisensor Blended Satellite Products

Water vapor is the fuel for much of what we perceive as weather, including the formation of clouds and precipitation. Since the primary source of water vapor is evaporation over the oceans, global satellite observations provide an essential measurement for forecasters. Weather forecasters routinely use two multisatellite blended products, Blended Total Precipitable Water (BTPW) and Advected Layer Precipitable Water (ALPW), to track pipelines of moisture which support heavy precipitation. Each product is driven primarily by passive microwave data, but infrared GOES and surface GPS data are used for BTPW. ALPW was transitioned to NOAA operations in 2024, and science upgrades to BTPW should be implemented in February 2025. ALPW represents four layers of the atmosphere and allows the flow of water vapor from different sources to be visualized. How these products are constructed and guidance on how to interpret them will be discussed.

As satellite and reanalysis records begin to cover more decades, it becomes possible to place the water vapor amounts into historical context and identify extreme events. The climate data is connected to real-time satellite soundings via a percentile ranking to deliver situational awareness to forecasters. These results complement traditional radiosonde records spanning many decades. Applications of these products for atmospheric rivers will be given.