Why is the Advected Layer Precipitable Water (ALPW) product important?
The ALPW product offers a 4D structure of water vapor. Water vapor values are not dependent on the model. Retrieval is done in clear and cloudy (not precipitating) regions.

How is the ALPW product made?
Microwave Integrated Retrieval System (MiRS) retrievals of moisture and temperature derived from 5 polar orbiting satellites. Data swaths are advected up to 9 hours before a common time via GFS wind forecasts and averaged. 4 layers are created (see vertical resolution).

Primary Applications:
Atmospheric Rivers:
Reveals depth of moisture not apparent in TPW, GOES water vapor imagery or radiosondes. Especially useful for water vapor transport over ocean since that is outside the radiosonde network.

Flood events: ALPW can show convergence of moisture from different sources, such as long-distance water vapor transport.

Tropical waves: Complements Saharan Air Layer (SAL) product in cloudy skies to show whether wave environment is supportive of genesis / intensification.

Impact on Operations
Precipitation: Although retrievals are made in cloudy regions, they are NOT made in precipitating regions. These regions are shown as missing data.

High elevation regions: In the lower level layers for high elevation regions, the layer may be above ground level (missing data) or only depicts a portion of the layer (lower moisture value than you may expect).

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Quick Guide

This image illustrates an application of the ALPW product to a flood event in the Kansas City, MO vicinity in 2014. Arrows of different colors depict plumes of moisture at different levels in the vertical. At low levels (top 2 panels), a moisture plume with origins from the Gulf of Mexico advects northward towards the KC vicinity. At mid- and upper levels (bottom 2 panels), moisture from a remnant tropical system and northern Mexico advects east/northeast towards the KC vicinity. The ALPW product allows you to track moisture plumes horizontally while identifying the vertical distribution of moisture.

Where to find ALPW in AWIPS

Currently, ALPW is not on the SBN, however, it is available from CIRA via LDM. Email Dan.Bikos@colostate.edu for setup instructions. The goal is to make ALPW operational and sent via SBN.

The ALPW product is not intended to replace TPW products, rather to complement and supplement TPW.

Resources

VISIT Student Guide
http://rammb.cira.colostate.edu/training/visit/training_sessions/advected_layer_precipitable_water_product/

Real-time web-page
http://cat.cira.colostate.edu/sport/layered/advected/LPW-alt.htm

http://dx.doi.org/10.15191/nwajom.2015.0305