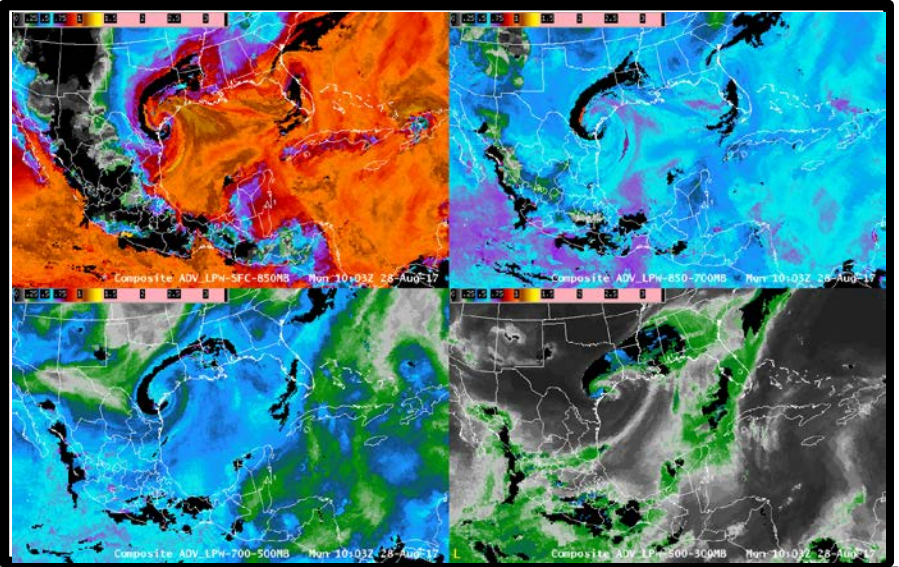


Why is the Advected Layer Precipitable Water (ALPW) product important?

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 7 polar orbiting satellites. Data swaths are advected up to 10 hours before a common time via GFS wind forecasts and averaged. 4 layers are created (see vertical resolution).



Advected Layer Precipitable Water (ALPW) at 1003 UTC, 28 August 2017

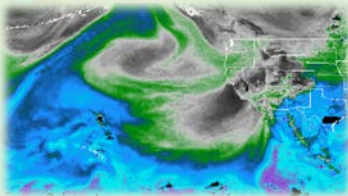
Time resolution	Spatial resolution	Vertical resolution	Moisture Variables
Produced every three hours at 00, 03...21. No data older than 10 hours is used.	16 km on a Mercator projection.	4 layers: Surface– 850 mb 850-700 mb 700-500 mb 500-300 mb	Layer precipitable water vapor (in)

Impact on Operations

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.

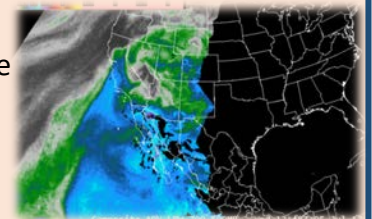


Flood events: ALPW can show convergence of moisture from different sources, such as long-distance water vapor transport.

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

Limitations

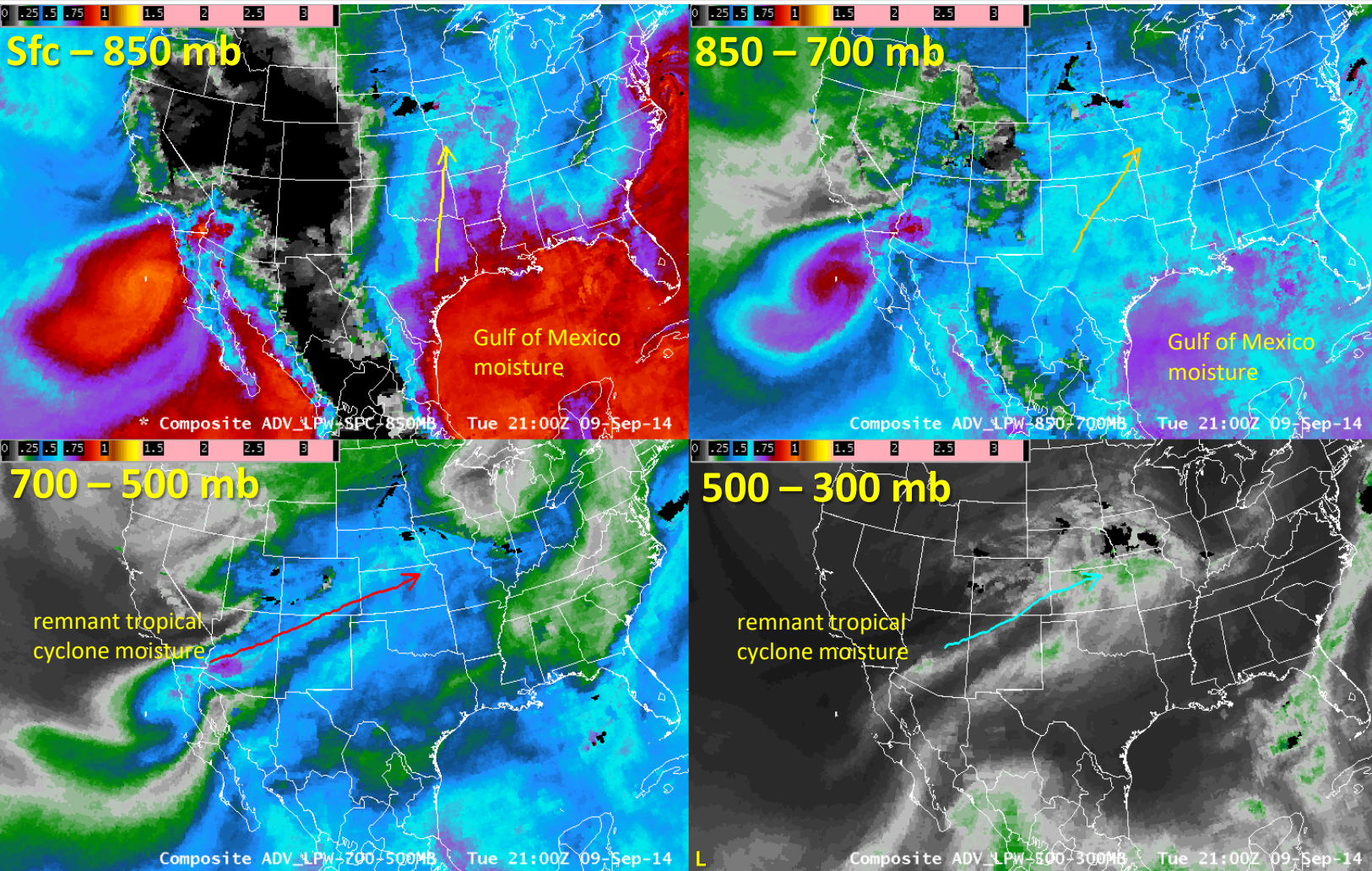
Missing data: there is occasional missing data due to non-uniform temporal sampling of the polar orbiting satellite system



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)

Quick Guide



ALPW product at 2100 UTC, 09 September 2014.

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.

Forsythe, J. M., S. Q. Kidder, K. K. Fuell, A. LeRoy, G. J. Jedlovec, and A. S. Jones, 2015: A multisensor, blended, layered water vapor product for weather analysis and forecasting. *J. Operational Meteor.*, 3 (5), 41–58.
<http://dx.doi.org/10.15191/nwajom.2015.0305>

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