

## **Maximum Potential Precipitable Water – A More Robust Moisture Variable?**

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The amount of moisture available to developing moist convection has been shown to be positively correlated to the likelihood that the convection will produce flash flooding over a particular area. Forecasters have traditionally used precipitable water (PWAT) as a measure of this available moisture. PWAT is determined solely by the moisture profile in a sounding and is therefore very sensitive to changes that occur when a profile saturates as convection arrives at a particular location. These rapid changes in PWAT when actual or modeled convection impact a location make determining representative values indicative of flash flood potential difficult.

We have defined a new moisture variable, maximum potential PWAT ( $PWAT_{max}$ ), to address this problem.  $PWAT_{max}$  is the PWAT of a given profile, saturated along the wet bulb temperature. It is envisaged that this variable will be more stable when convection influences a sounding location, and may more accurately pinpoint days when moisture values are highly anomalous.

Research to date has been a proof of concept for  $PWAT_{max}$ , investigating its behavior during the 19 June 2007 Delaware County flash flood. During this event,  $PWAT_{max}$  displayed a much more stable behavior than the traditional PWAT in Rapid Update Cycle (RUC) model soundings, as expected by its definition, suggesting that further research with this variable is warranted.

Future research will aim at determining the usefulness of  $PWAT_{max}$  in a number of flash flood, heavy rain, and null events, and whether this variable provides more useful information to operational forecasters than the traditional PWAT formulation.