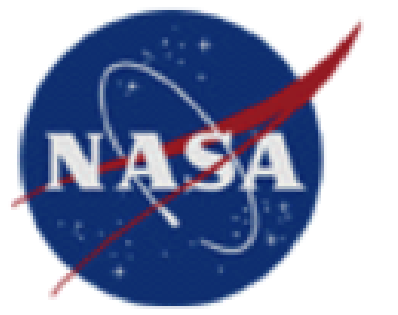




National Weather Service – Forecast Reference Evapotranspiration (FRET)

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1 National Weather Service – San Diego, 2 National Weather Service – Sacramento, 3 CSU Monterey Bay, 4 NASA Ames Research Center, 5 NOAA ESRL

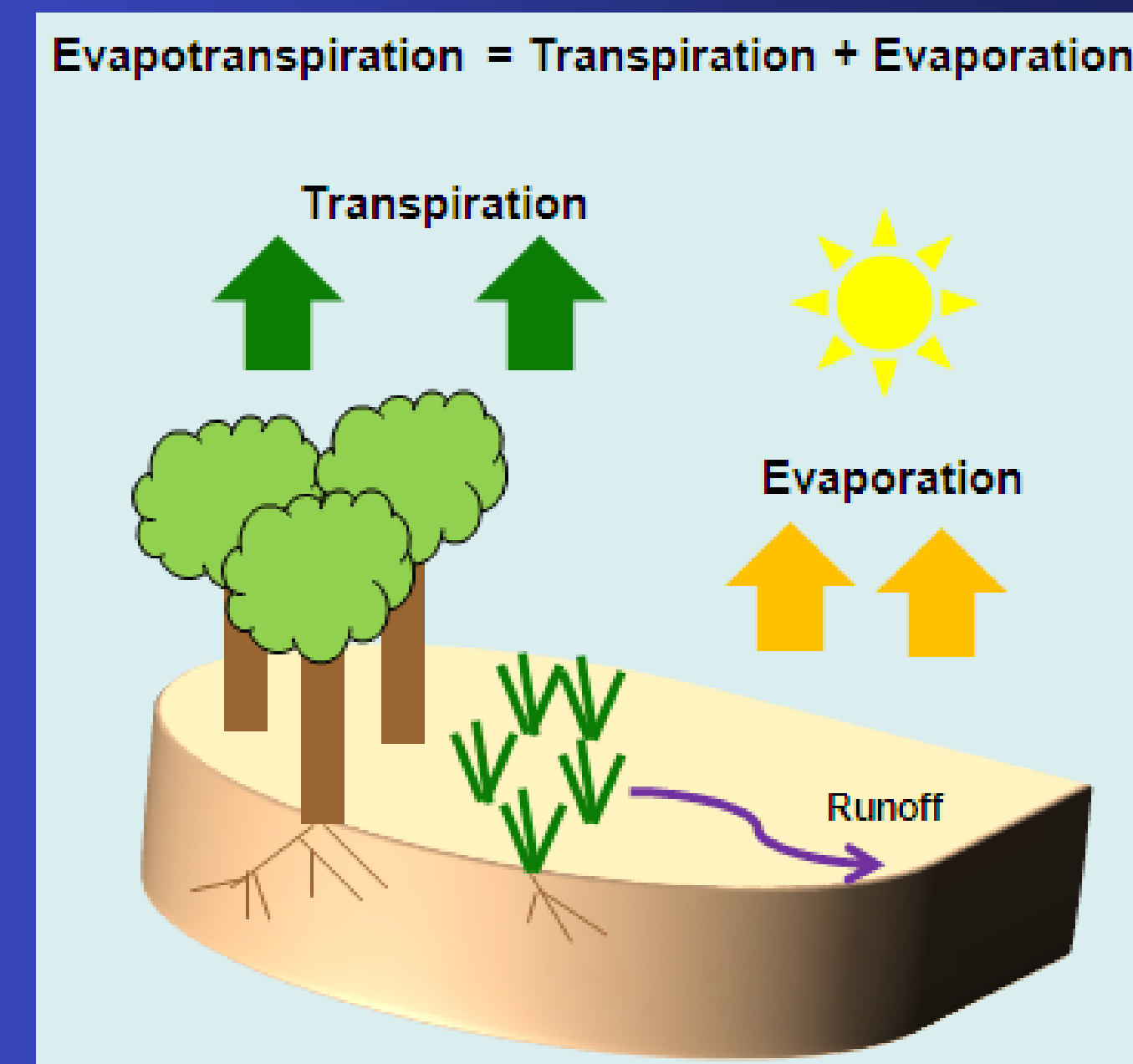


What is FRET?

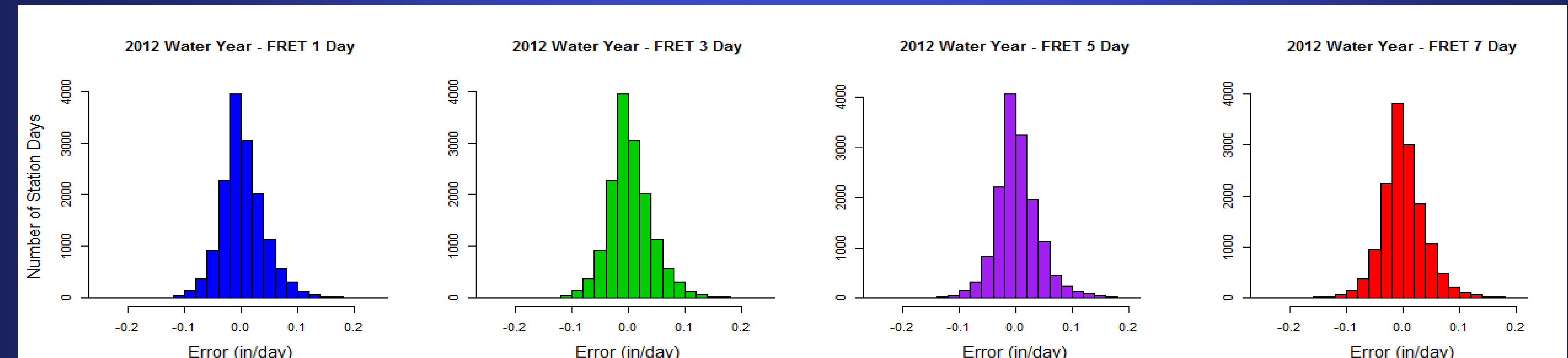
The National Weather Service is now producing Forecast Reference Crop Evapotranspiration (FRET), a forecast estimate of the amount of evapotranspiration for a well-watered reference crop (grass or alfalfa) under prescribed conditions for a 24 hour period. Weekly FRET forecast calculations and NLDAS derived reference crop ET Climatology and departure from normal are available as well.

* Penman Monteith (PM) equations (adopted by the American Society of Civil Engineers Environmental Water Resources Institute) use 12 cm grasses as the reference crop.

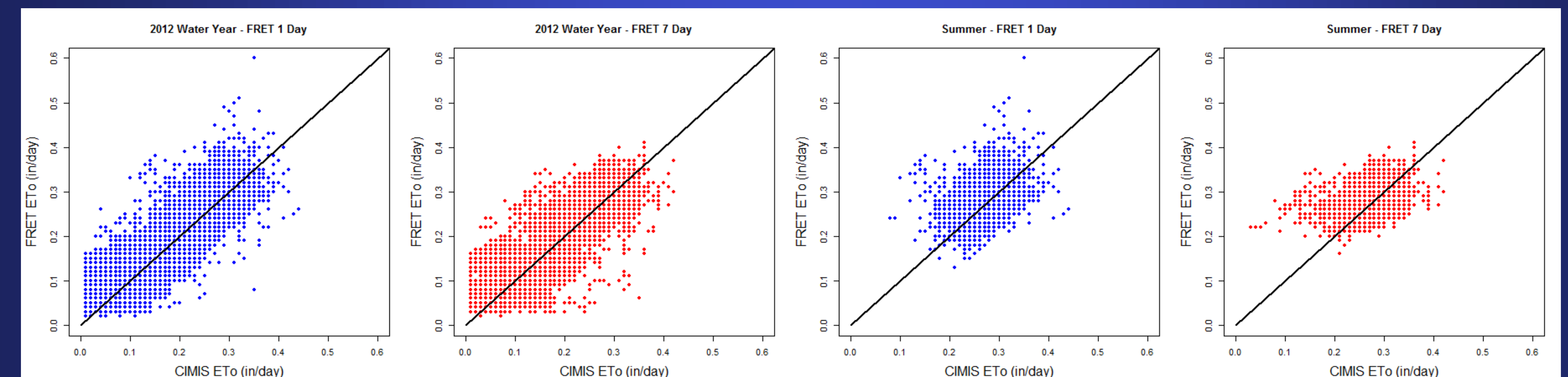
* Kimberly Penman (KP) (adopted by USBR in the Pacific Northwest) uses alfalfa as the reference crop.



FRET vs Observed CIMIS Reference Evapotranspiration



Histograms of the difference between FRET forecast ET_0 and CIMIS ET_0 for all stations indicate that more than 80% of forecasted ET_0 values are within +/- 0.05 in/day of the CIMIS station measurements for all forecast periods.



Water year and summer period scatter plot comparisons of CIMIS station and FRET ET_0 .

The bias and error in FRET ET_0 forecasts relative to CIMIS ET_0 is consistent across different forecast lead times, and forecast errors are generally less than 0.05 in/day. FRET forecasts have a slight positive bias relative to CIMIS station ET_0 data, with an increased bias in the summer months. This positive bias may lead users of this data to slightly over-estimate ET_0 (in general) and to err on the side of caution in making irrigation or water transport decisions.

Where can you find FRET?

Daily FRET, Departure from Normal, Weekly FRET and Reference ET Climatology:
<http://www.wrh.noaa.gov/forecast/evap/FRET/FRET.php?wfo=xxx>

User selected point FRET values:

<http://www.wrh.noaa.gov/forecast/wxtables/index.php?wfo=xxx>

Where xxx is the three letter identifier of your local weather forecast office (e.g . xxx=sto)

For more info contact: Cynthia.Palmer@noaa.gov Holly.Osborne@noaa.gov

Acknowledgements

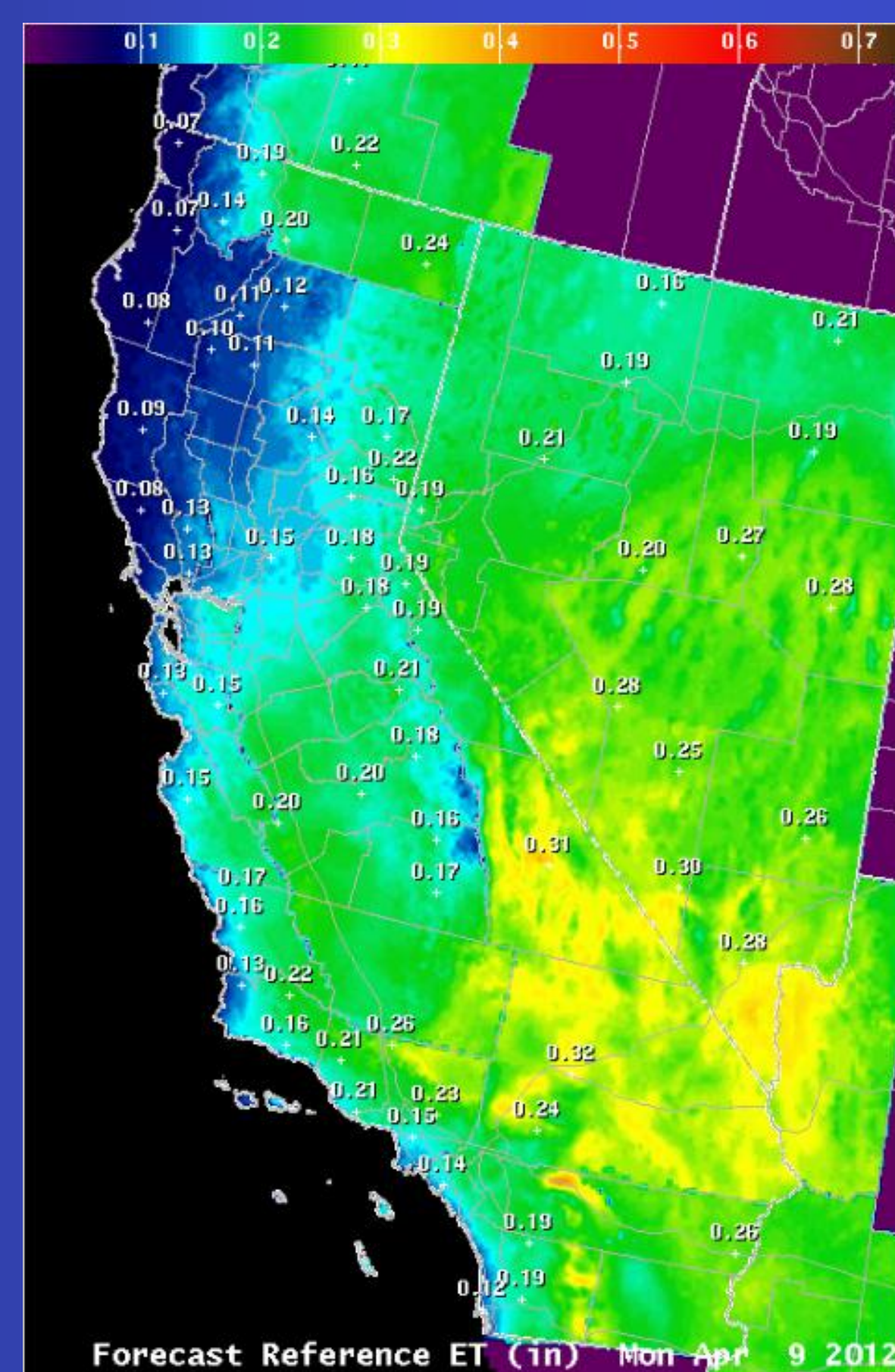
William Rasch- NWS Sacramento
 Dan Kozlowski and Kyle Lerman – CNRFC

What goes into FRET?

NWS Forecast
 Temperature,
 Sky Cover,
 Wind Speed,
 and Relative
 Humidity



Penman-Monteith
 or Kimberly
 Penman Reference
 Evapotranspiration
 Equations



Applications:

- Water Management (CA DWR)
- Soil Model Input
- Drought Mitigation
- University Research (UC Davis)
- Irrigation Management (agriculture, golf courses, public works departments)

Applications :

Example 1: Farmers can calculate how much water they need to maintain a depth of 6 inches of water for rice paddies.

Example 2: Water Management Agencies can calculate how much water to release for downstream use.

