

Progress Report for Project 5-300430, Yampa/White Roundtable Lysimeter Project: February 2015

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Weather Station

Data collection continues at the HYD01 (Hayden) CoAgMet station located at Carpenter Ranch (Figure 1). The station received annual operations and maintenance in April 2014 to ensure properly working sensors for the upcoming growing season. Maintenance will again be performed in the Spring of 2015. The graphs below show hourly data from Hayden displayed on the CoAgMet website (coagmet.colostate.edu).

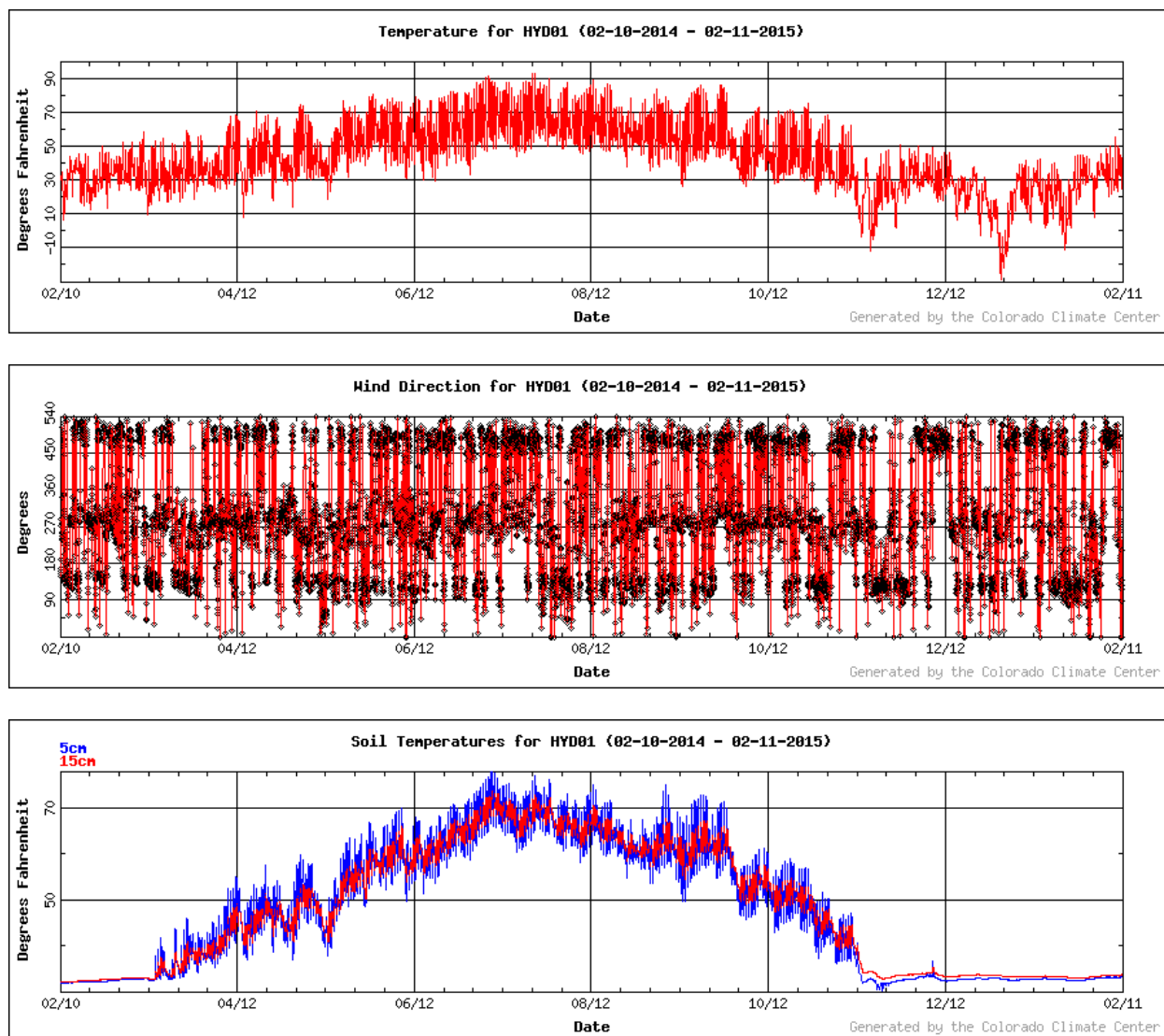


Figure 1: Hourly temperature, wind direction and soil temperature from the Hayden CoAgMet station for February 2014-February 2015.

Lysimeter Plots

Carpenter Ranch again had interns run the lysimeter plots during the growing season. The method used was to first weigh each dry lysimeter so that the difference from the last “wet” reading to the “dry” reading can be determined. Then each lysimeter is filled with roughly 5 gallons of water and allowed to drain to field capacity (about 3-4 hours). After that time, each lysimeter was then weighed again so that the “wet” weight is known for ET calculations.

Data were received from the lysimeters at Carpenter Ranch; however the readings are still problematic. One of the buckets broke this past season and some data were lost from that bucket lysimeter. In general, the readings between the 4 lysimeters are not consistent with each other and in some cases the “wet” weight reported was less than the “dry” weight resulting in negative consumptive use. At this point, it is unclear if the problem is the method, the observers or the equipment. The method is problematic for a few reasons. The amount of time needed for the lysimeter to drain is mainly a trial and error exercise. The observer must return to ensure all excess water was drained from the lysimeter, otherwise that drainage could potentially be mistakenly calculated as consumptive use by just simply taking the difference from “wet” to “dry”. In other words, the lysimeters may not be getting to field capacity before the “wet” weight is taken. This is one source of error but it is clear that more diligence is needed when taking observations and recording them. The dry weight should not be heavier than the wet weight unless there was an inundating rainstorm. This happened twice during the 2014 growing season and any corrections made to the data will simply be subjective.

For the 2015 season, the CCC will implement quality control checks into the spreadsheet the observers are using that will flag these sorts of cases (i.e. negative consumptive use) that may alert them to mis-keyed data or other issues. We will continue to work with CDWR to try and make the consumptive use calculations since they are more involved in the observations than the CCC.

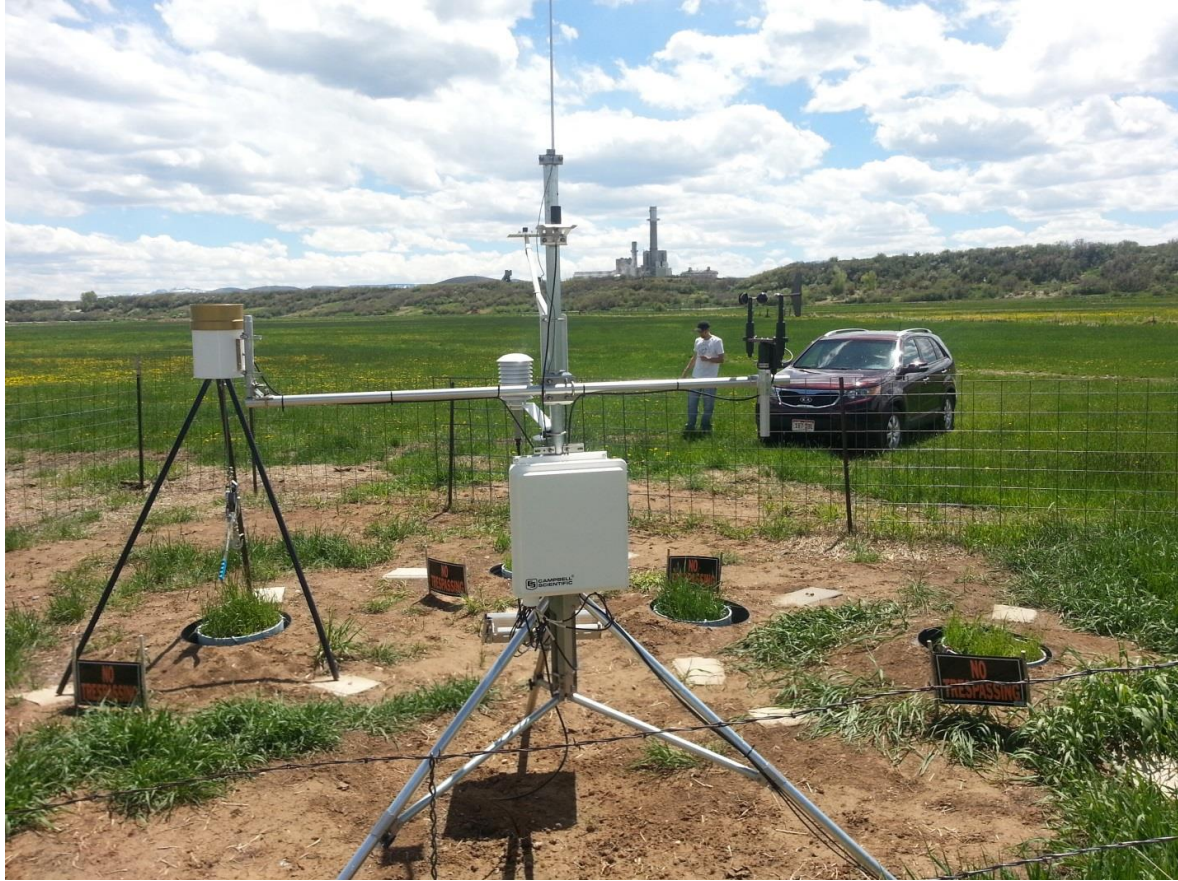


Figure 2: Site photo (looking South) with the lysimeter plots behind the station. Note the established grass within the lysimeter plots.

From the weather data collected by the automated station, reference ET can be calculated. The calculated ET from the station for growing seasons 2013 and 2014 is shown in Figure 3. Precipitation is also included in the graphic for each year. 2013 is shown in green and 2014 is shown in blue. Note the higher ET values in 2013 when it was warmer and dryer in the area. The two growing seasons started off fairly similar in the early season, but deviated as the season progressed. ET was suppressed in 2014 starting about July when the enhanced North American monsoon became active bringing frequent rounds of precipitation.

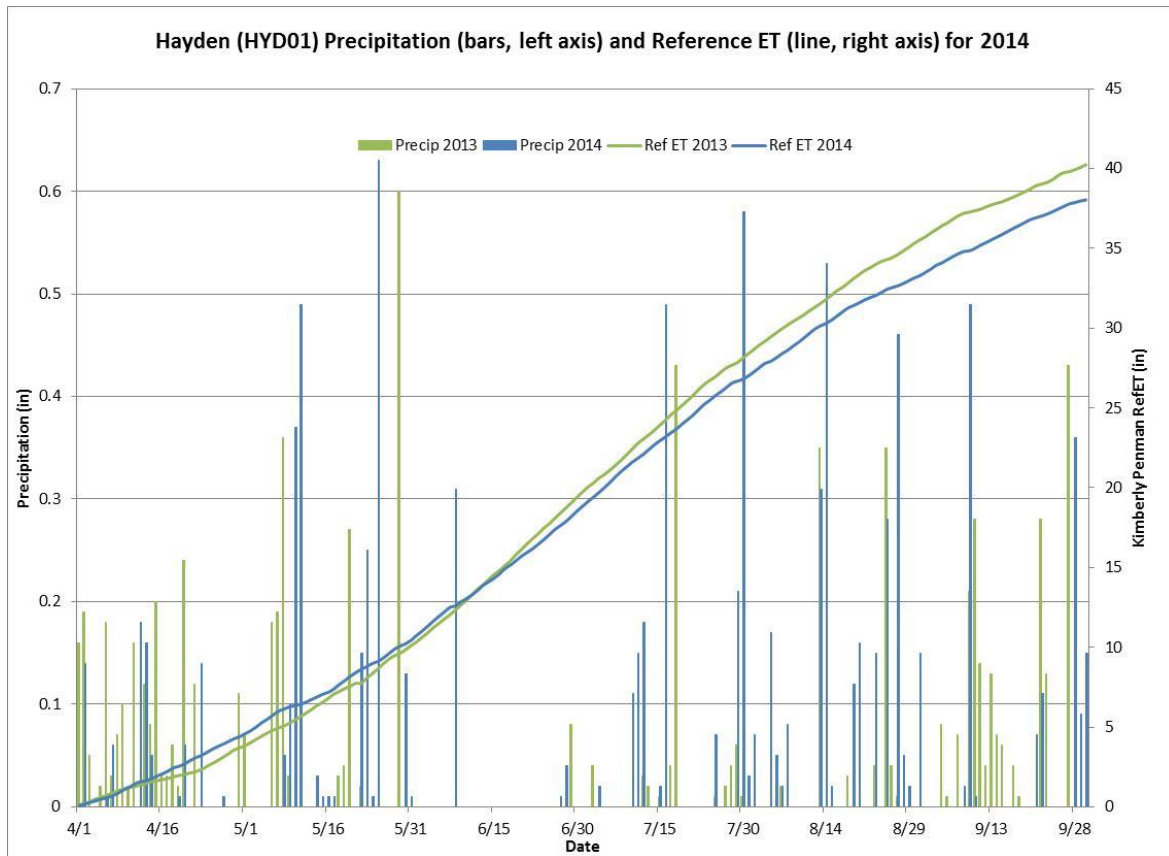


Figure 3: Kimberly-Penman reference ET and precipitation from the Hayden CoAgMet station for 2013 and 2014.