Freely available evapotranspiration maps help improve irrigation accuracy
July 14, 2014

Following an abnormally wet June, much of Nebraska has been sunny, hot, and dry since the Independence Day weekend. While most people have sought relief in the air conditioning or by the pool, plants have kept cool by transpiring water from their leaves. Transpiration is so important to plants that over 98% of water used by a plant is used for cooling. Plant transpiration, like human perspiration, is an example of evaporative cooling which transfers heat energy from hot grass leaves to evaporating water.

Many golf courses irrigate to replace some or all of the water lost during plant transpiration and soil evaporation (evapotranspiration). While most on-site weather stations calculate daily potential evapotranspiration (pET), there is also a free website that provides accurate pET data from the High Plains Regional Climate Center. That weather data is combined with satellite images to create pET maps (Fig. 1). Daily or weekly pET maps can be found at www.hprcc.unl.edu/awdn/maps/ under the potential evapotranspiration tab.

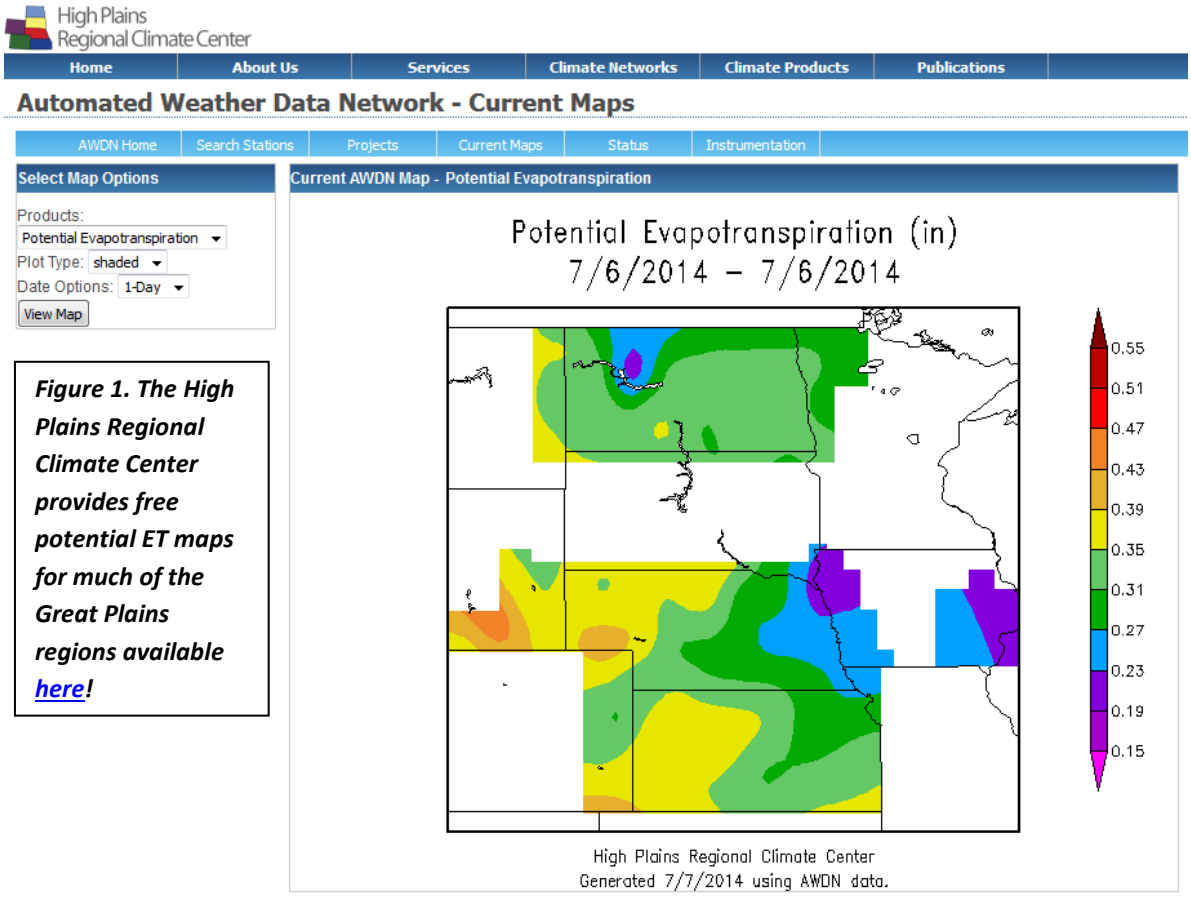

Figure 1. The High Plains Regional Climate Center provides free potential ET maps for much of the Great Plains regions available here!

Potential evapotranspiration is different than actual amount of water used by the turf plant. It needs to be corrected with a crop coefficient (K_c) which varies depending on the plant and growing environment. The K_c for cool season grasses grown in full sun is typically near 80% of pET. For example, actual ET of a cool season grass grown in full sun would be 0.16" when pET was 0.20". Irrigating with 0.16" of water would replenish the amount of water lost during the previous day. Turf grown in shade has a lower K_c because there is less sunlight to heat up the plant. Warm season turfgrass species like buffalograss have even lower K_c values ranging from 40 to 60% of pET.

When rainfall is fairly regular (like this year), try watering with a lower K_c such as 50 or 60% of pET and allow rainfall to fill the gap. This is called deficit irrigation and is a good way to conserve water and dry out the surface. However, watch for signs of drought during prolonged periods without rain. If the turf shows signs of wilt consider hand-watering dry areas and running a long irrigation cycle to replenish soil moisture. A TDR soil moisture probe is a great tool to monitor soil moisture during dry-down periods. Try to use the freely available pET maps to increase the accuracy of irrigation at your facility.

A TDR probe and other tools to measure turfgrass performance will be available at the 2014 Summer Field Day on Wednesday July 23. Learn how to effectively use a TDR probe to manage soil moisture. Find more information about Summer Field Day here: Registration and Attendee Brochure.

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