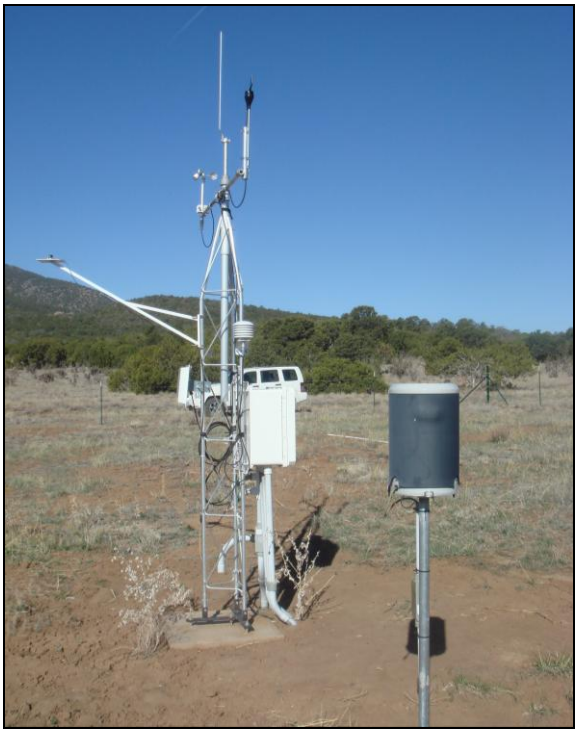
SOUTH MOUNTAIN WEATHER STATION: REPORT FOR QUARTER 2 (APRIL-JUNE) 2010



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SOUTH MOUNTAIN WEATHER STATION DATA FOR QUARTER 2, 2010 (APRIL-JUNE, 2010)

This quarterly report provides graphs of summarized rainfall and soil moisture data for the period April-June, 2010. Please see the South Mountain Weather Station 2008 Annual Report on the New Mexico Forest and Watershed Restoration Institute (NMFWRI) website (http://www.nmfwri.org/images/stories/pdfs/Estancia_Basin_Monitoring/South_Mountain_Weather_Station/SMWS_Manual.pdf) for detailed information about the location, configuration, history, and operation of the South Mountain Weather Station. Complete raw data files for hourly measurements of all South Mountain Weather Station variables were submitted to the NMFWRI at the time this report was submitted. Those data files also may be accessed through the NMFWRI web site (ftp://ftp.nmfwri.org/South_Mountain_Excel_Files/). The weather station data logger records readings from all instruments every 10-minutes. Data presented here are summarized to hourly, daily or monthly averages.

SUMMARY OF 2010 QUARTER 2 DATA

This section presents graphical summaries of data obtained from the SMWS, via wireless offload, for the interval April 1st, 2010 to June 30th, 2010. Summary graphs and tables have been created for several basic climate parameters: 1) daily rainfall, 2) daily minimum and maximum ambient temperatures, 3) average daily ambient temperature with average daily relative humidity, and 4) daily average soil moisture at different depths for each both the meadow and the tree site.

Below is a list of the variables that the south mountain weather station takes every 10 minutes. Not all the variables being measured are presented here, this report summarizes the more "important" data.

Variable	Units
Precipitation	Inches
Wind speed	Miles per hour
Wind direction	Degrees
Ambient air temperature	Degrees fahrenheit
Ambient relative humidity	Percent
Solar, lunar and sky radiation intensity	Kilowatts/meter
Soil temperature at different depths	Degrees fahrenheit
Soil moisture content at different depths	Percent volume water content

Precipitation

Daily precipitation values from April 1, 2010 thru June 30, 2010 are presented graphically in Figure 1 below. The total precipitation received during quarter 2 was 1.5 inches with April receiving 0.56 inches, May receiving 0.21 inches, and June receiving 0.73 inches.

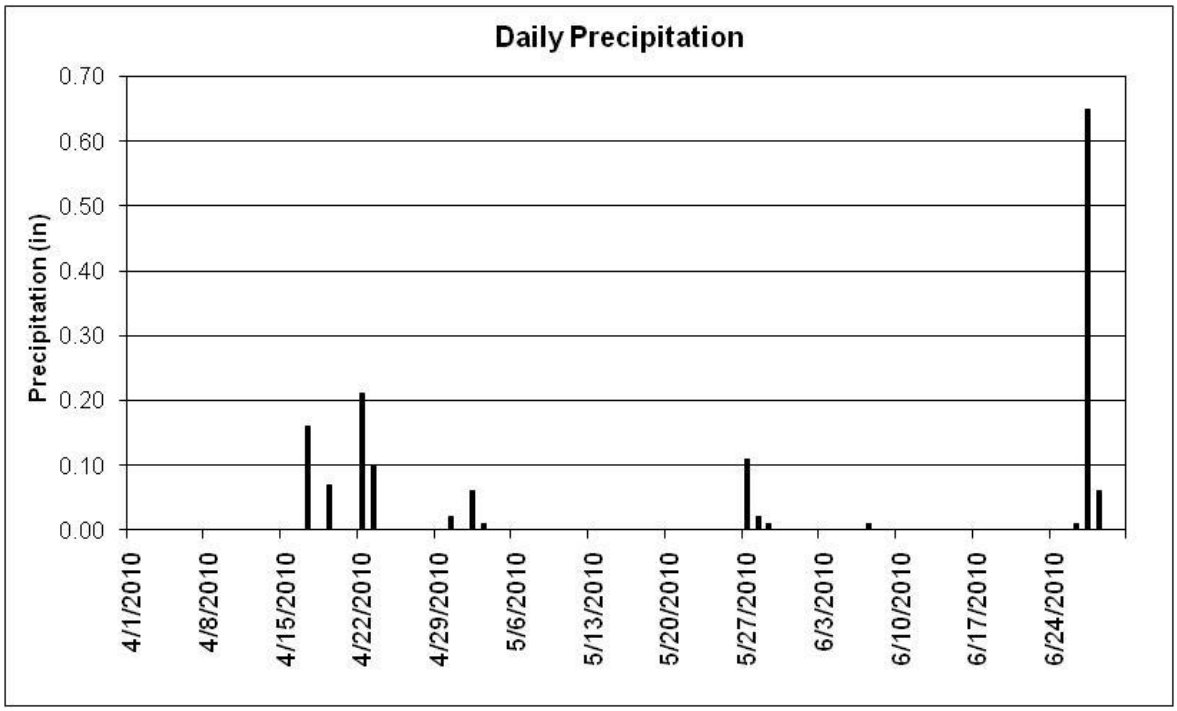

Figure 1. Daily total precipitation (inches), April 2010 – June 2010, from the SMWS.

Soil Moisture

Soil moisture measurements taken from both the tree and meadow site are displayed below in Figures 2 through 5.

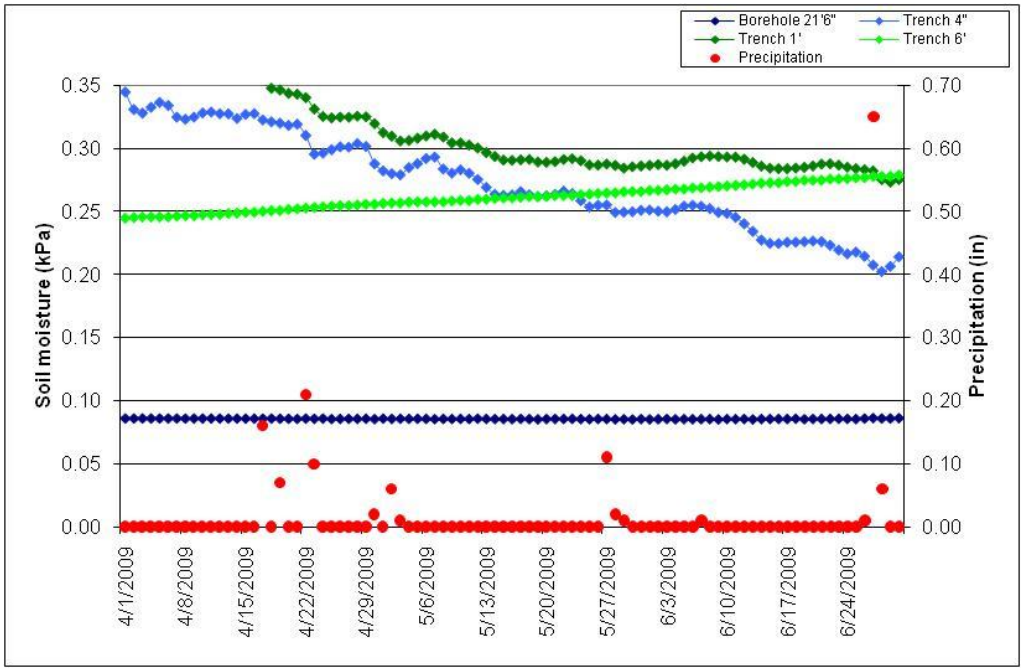

Figure 2. Average daily soil moisture levels (kPa) at four depths, and precipitation (inches) from the tree site between April 2010 – June 2010.

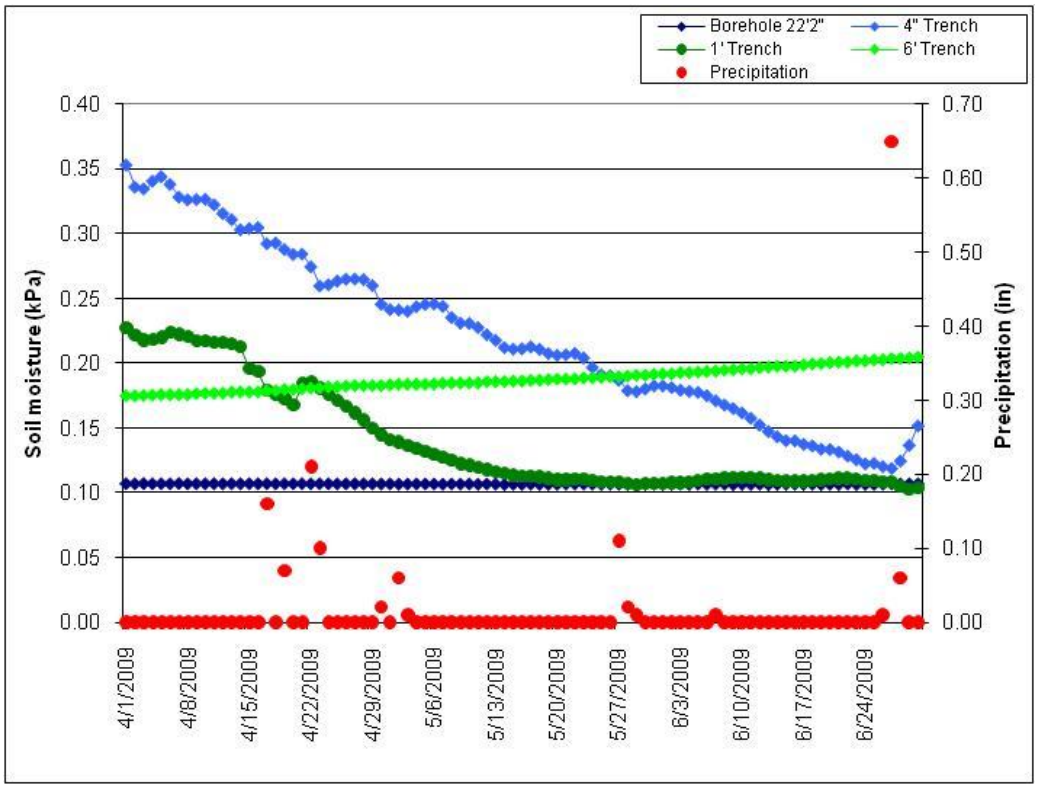

Figure 1. Average daily soil moisture levels (kPa) at four depths, and precipitation (inches) from the meadow site between April 2010 – June 2010.

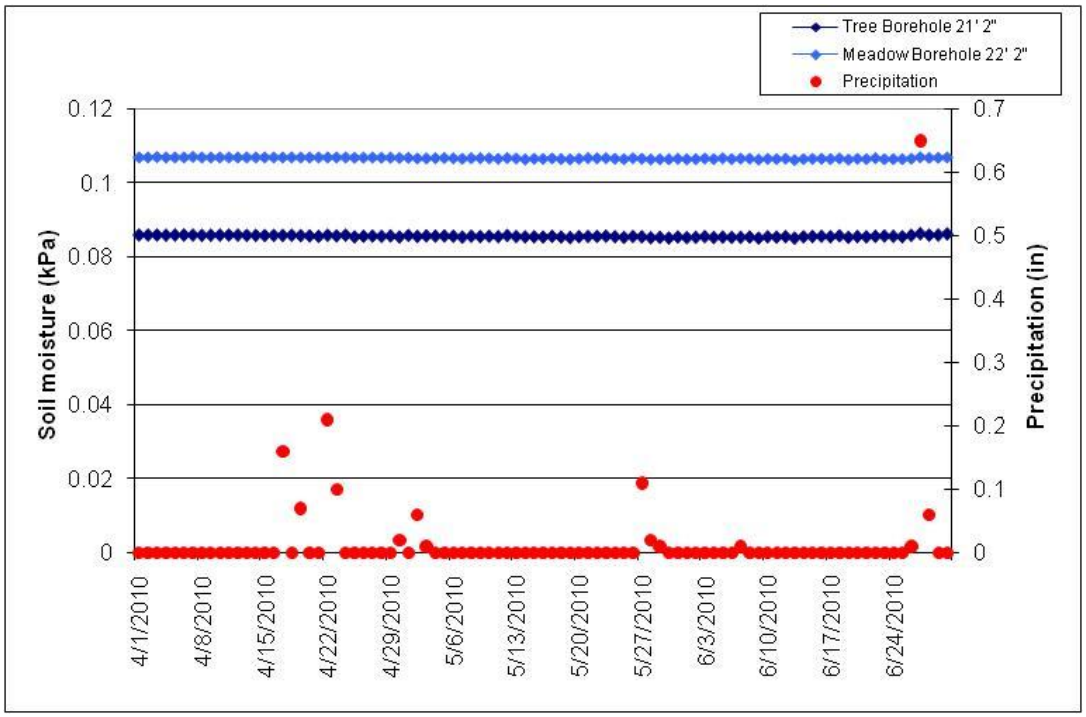

Figure 4. Comparison of Tree and Meadow soil moisture levels (kPa) at the 20+ foot depths plotted with precipitation from April 2010 – June 2010.

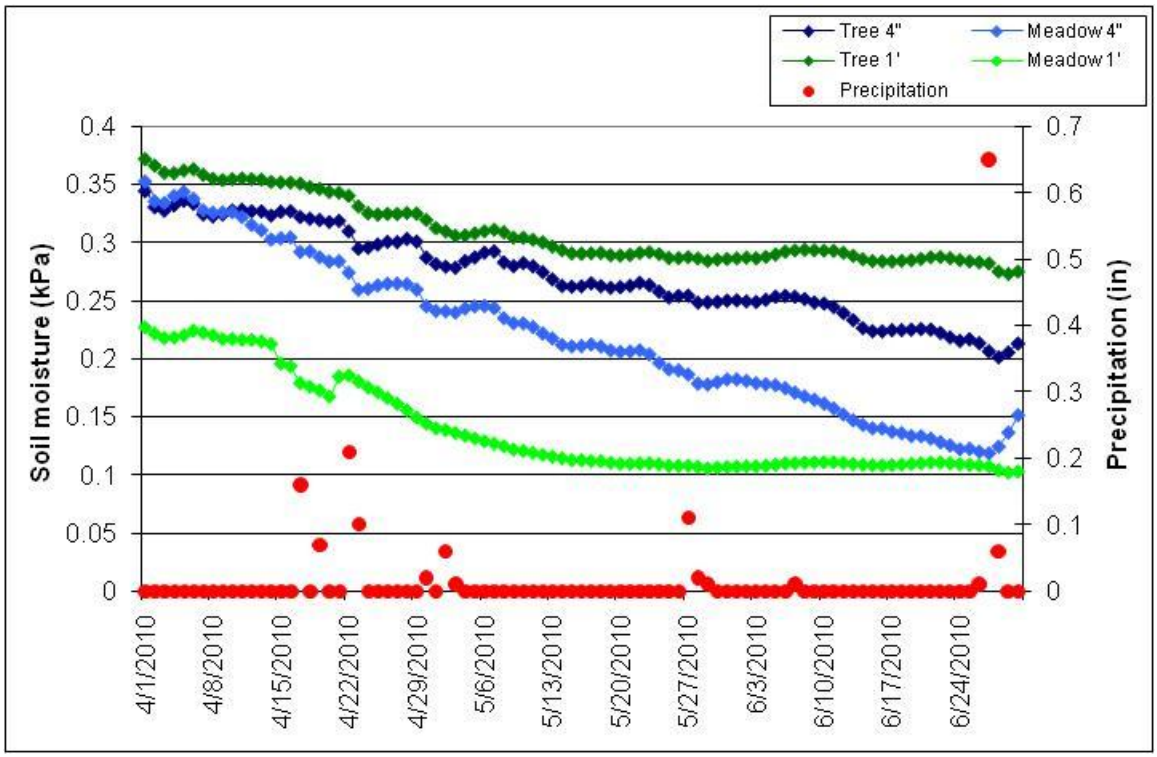

Figure 5. Comparison of Tree and Meadow soil moisture levels at the 4", and 1' depths, along with precipitation, April 2010 – June 2010.

Temperature and Relative Humidity

Below Figures 6 and 7 summarize the daily minimum and maximum ambient temperatures occurring during Quarter 2. Figure 8 displays the average temperature plotted against the average relative humidity.

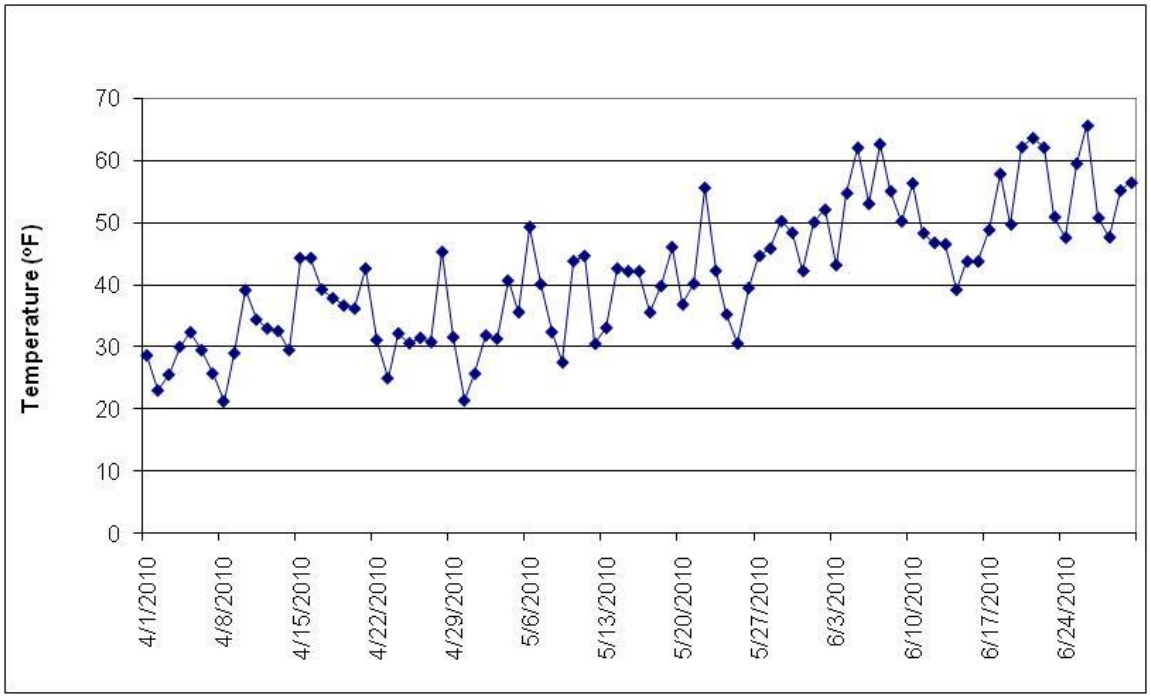

Figure 6. Daily Minimum Ambient Temperature (Fahrenheit) April 2010 – June 2010.

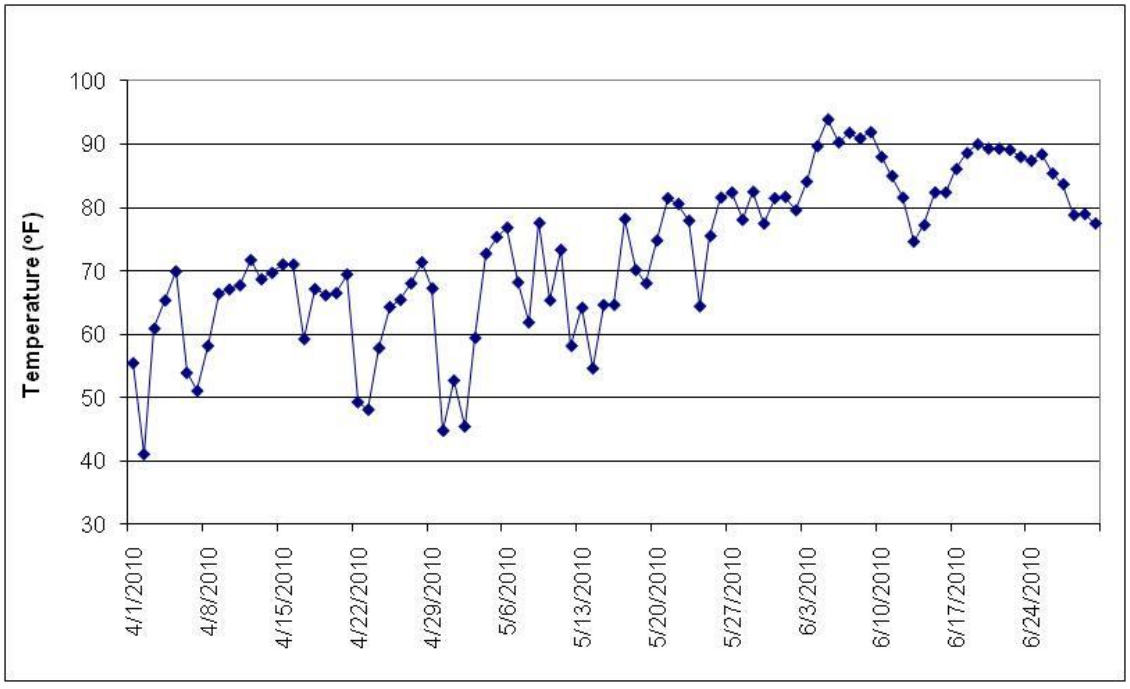

Figure 7. Daily Maximum Ambient Temperature (Fahrenheit) April 2010 – June 2010.

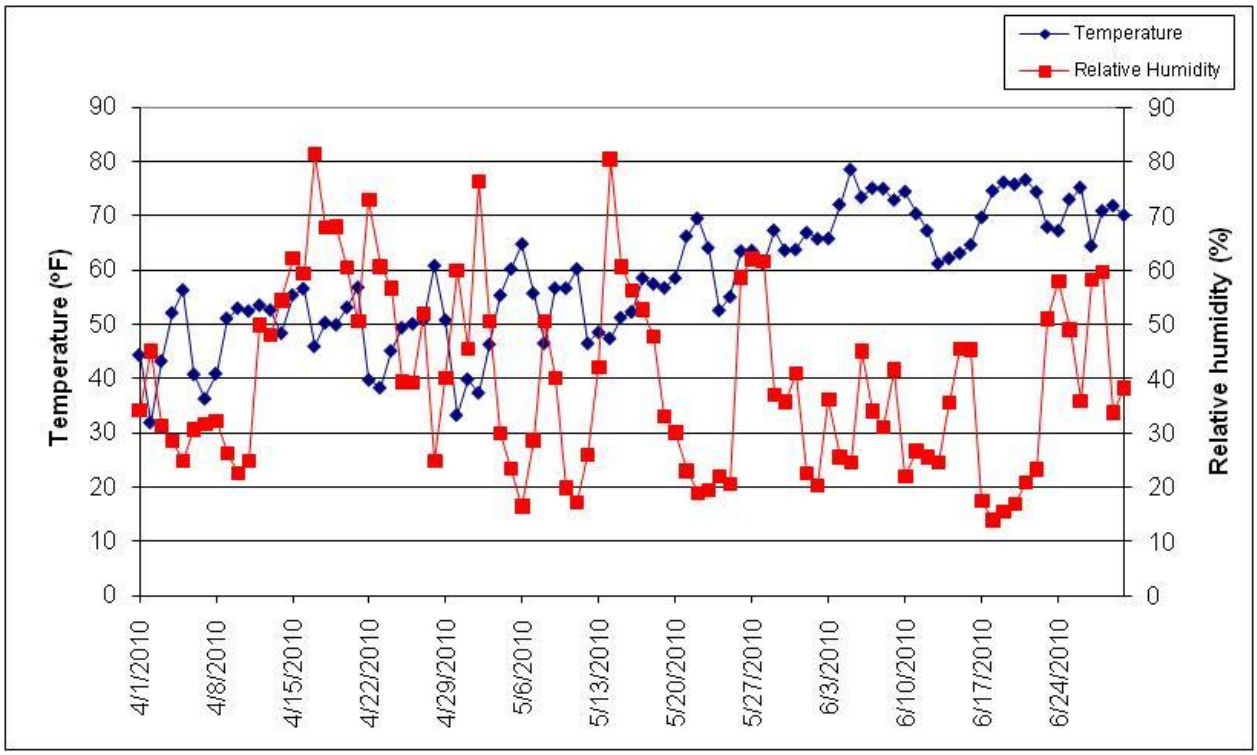

Figure 8. Average daily ambient temperature and humidity from April 2010 – June 2010.

Interpretation of Quarter 2 2010 Data

The overlay of precipitation and soil moisture showed correlation between precipitation and soil moisture levels during the time period of April–June 2010. A response to the precipitation events can clearly be seen in the soil moistures at both the tree and meadow site. Visually examining the graphs of soil moisture and precipitation at the tree and the meadow sites show that the soil moisture response was more pronounced at the 4-inch and 1-foot trench levels at the meadow location. This can possibly be attributed to the difference of the spatial variances between the sites. Not surprisingly, the closer to the surface and the more exposed to the elements, the faster the soil moisture values for the meadow site respond to precipitation in comparison with the tree site.

The atmospheric data collected at the SMWS can be used as a reference for particular storm events. It also can provide the ability to compare meteorological data from 2008, 2009, and future data. For example, this year it would be possible to compare 2007–2010 precipitation data and daily maximum temperatures to see how the inter-year variability looks. The SMWS will also provide an interesting comparison to the WatchDog Mini Weather Stations installed in and around the Estancia Basin and within the Trigo fire burn area perimeter.