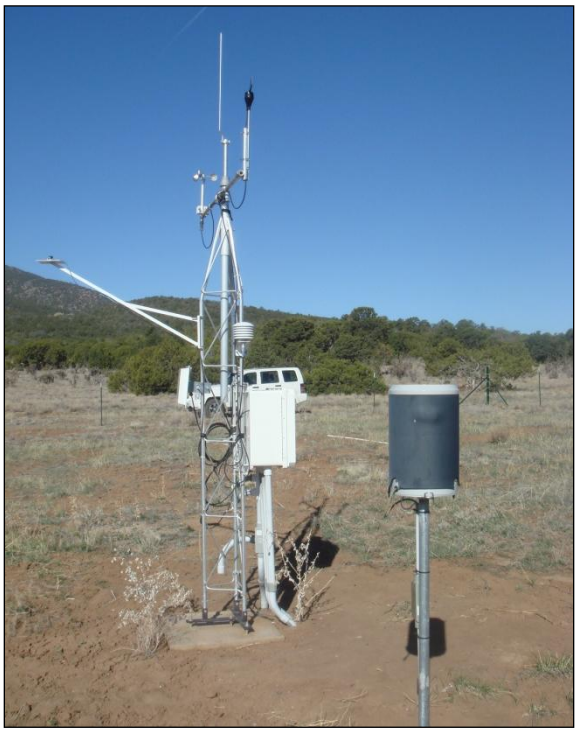
SOUTH MOUNTAIN WEATHER STATION: REPORT FOR QUARTER 2 (APRIL–JUNE) 2011



Prepared for
ESTANCIA BASIN WATERSHED HEALTH,
RESTORATION AND MONITORING STEERING COMMITTEE

c/o CLAUNCH-PINTO SOIL AND WATER CONSERVATION DISTRICT
P.O. Box 129
Mountainair, New Mexico 87036
Telephone (505) 847-2941

Prepared by
SWCA® ENVIRONMENTAL CONSULTANTS
5647 Jefferson Street NE
Albuquerque, New Mexico 87109
Telephone: (505) 254-1115; Fax: (505) 254-1116

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SOUTH MOUNTAIN WEATHER STATION DATA FOR QUARTER 2, 2011 (APRIL–JUNE, 2011)

This quarterly report provides graphs of summarized rainfall and soil moisture data for the period of April through June 2011. Please see the South Mountain Weather Station (SMWS) 2008 Annual Report on the New Mexico Forest and Watershed Restoration Institute (Restoration Institute) 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 SMWS. Complete raw data files for hourly measurements of all SMWS variables were submitted to the Restoration Institute at the time this report was submitted. Those data files also may be accessed through the Restoration Institute website (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 2011 QUARTER 2 DATA

This section presents graphical summaries of data obtained from the SMWS, via wireless offload, for the interval of April 1 to June 30, 2011. 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 sites.

Below is a list of the variables that the SMWS takes every 10 minutes (Table 1). Not all the variables being measured are presented here, this report summarizes the more "important" data.

Table 1. SMWS Data Variables

Variable	Units
Wind speed	Inches
Wind direction	Miles per hour
Ambient air temperature	Degrees
Ambient relative humidity	Degrees Fahrenheit
Solar, lunar, and sky radiation intensity	Kilowatts per meter
Soil temperature at different depths	Degrees Fahrenheit
Soil moisture content at different depths	Kilopascal

Precipitation

Daily precipitation values from April 1 through June 30, 2011, are presented graphically in Figure 1 below. The total precipitation received during Quarter 2 was 0.48 inch with a majority of the rain coming during the month of April (0.27 inch). The precipitation values are much lower than in other years because of an exceptional drought occurring over the study area in 2011.

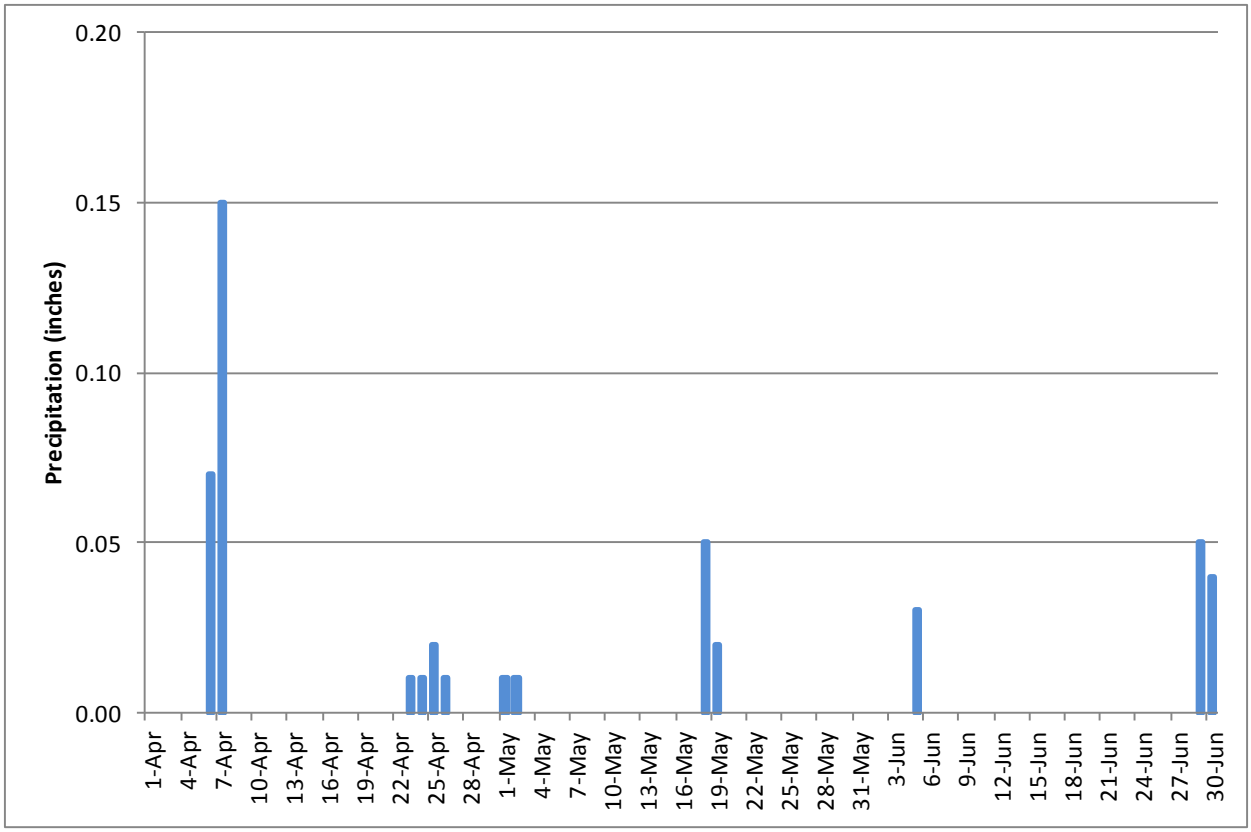

Figure 1. Daily total precipitation (inches), April–June 2011, from the SMWS.

Soil Moisture

Soil moisture measurements taken from both the Tree and Meadow sites are displayed below in Figure 2 through Figure 5.

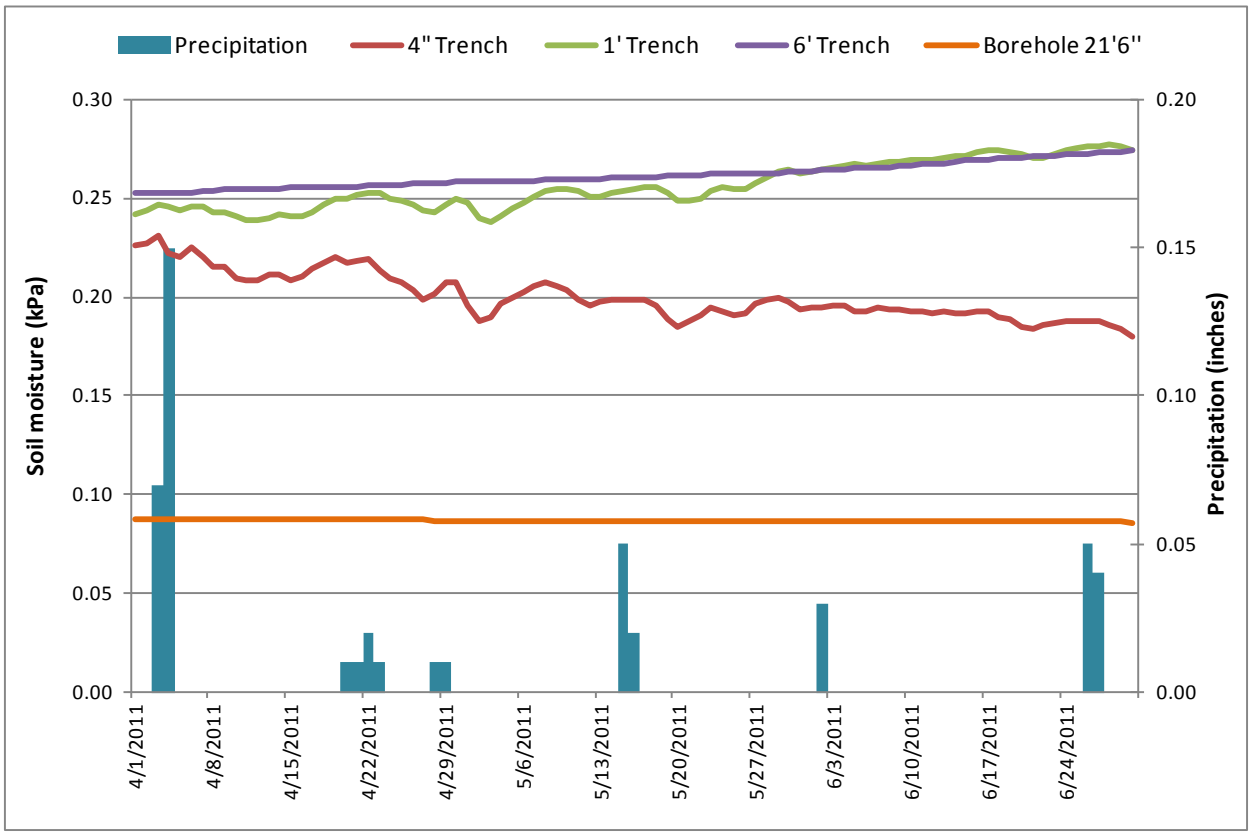

Figure 2. Average daily soil moisture levels (kPa) at four depths and precipitation (inches) from the Tree site, April–June 2011.

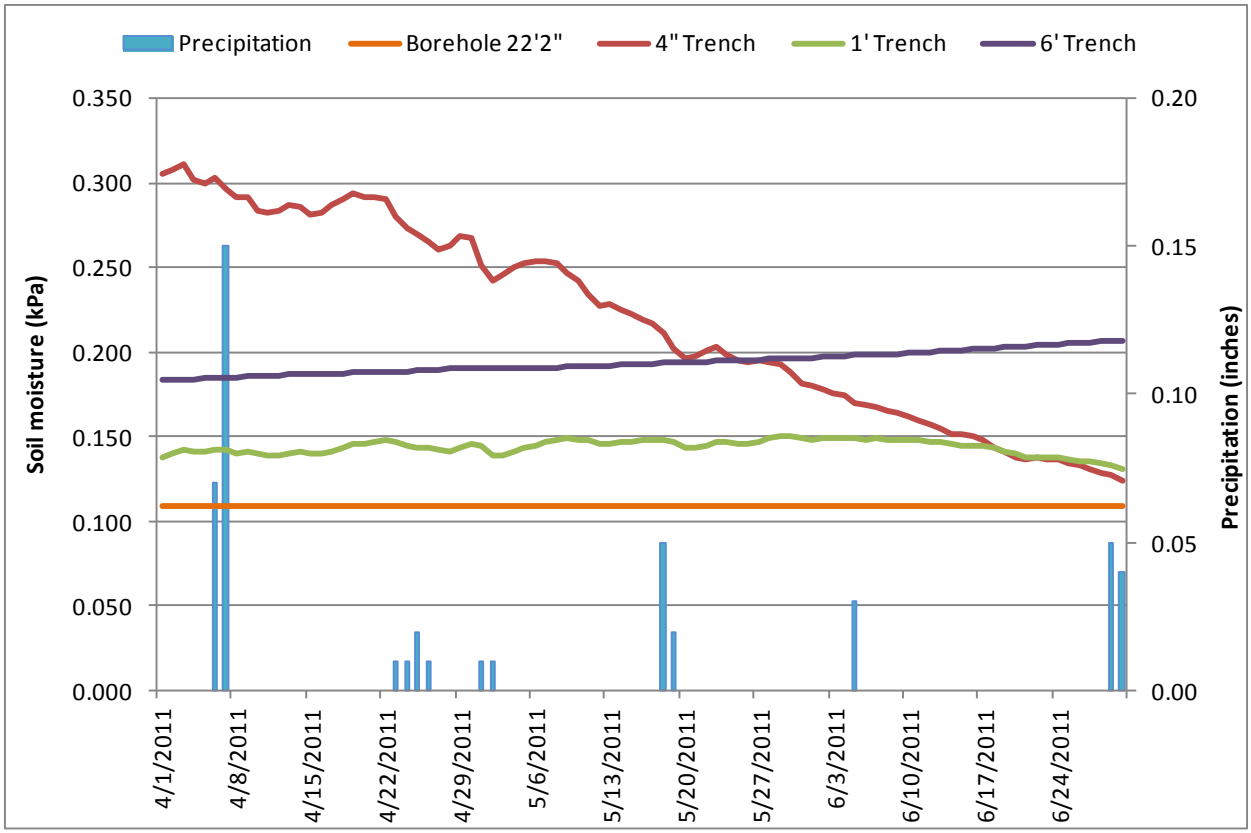

Figure 3. Average daily soil moisture levels (kPa) at four depths and precipitation (inches) from the Meadow site, April–June 2011.

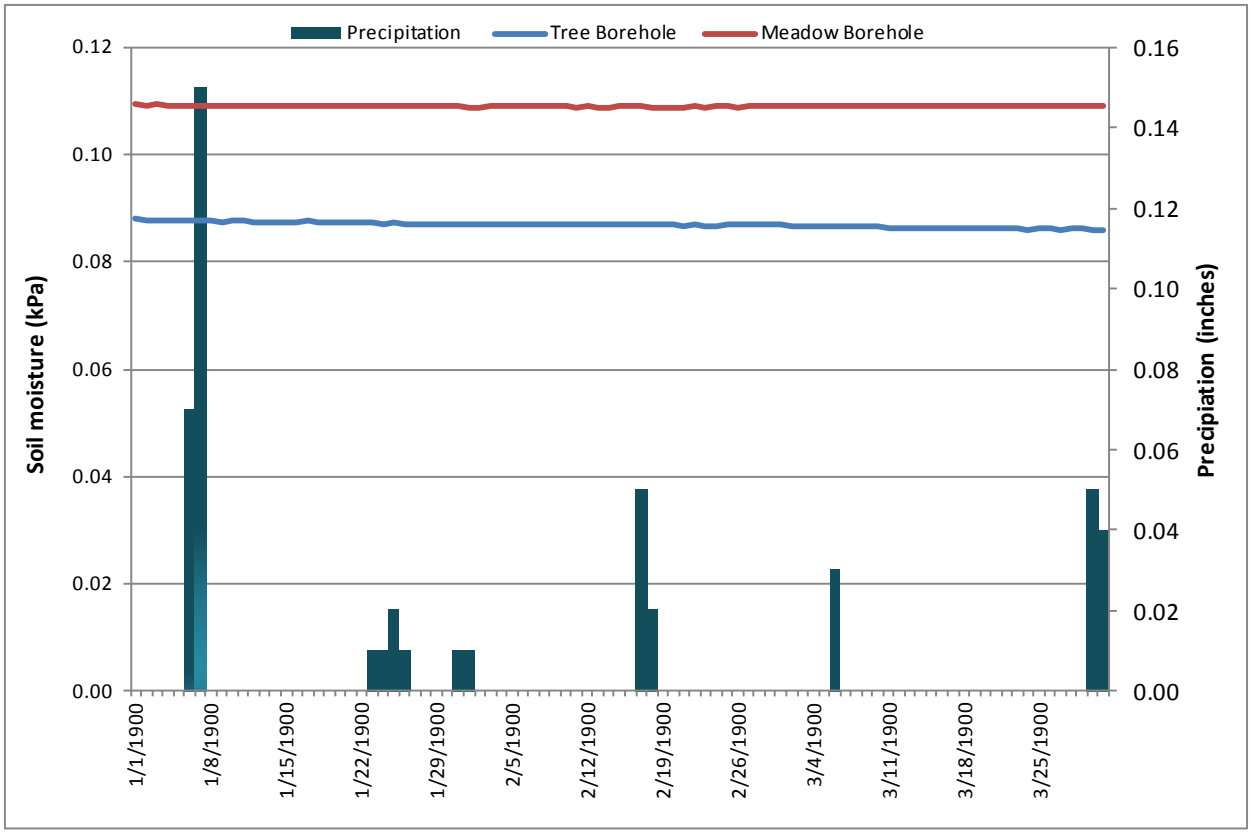

Figure 4. Comparison of Tree and Meadow soil moisture levels (kPa) at the over 20-foot depths plotted with precipitation, April–June 2011.

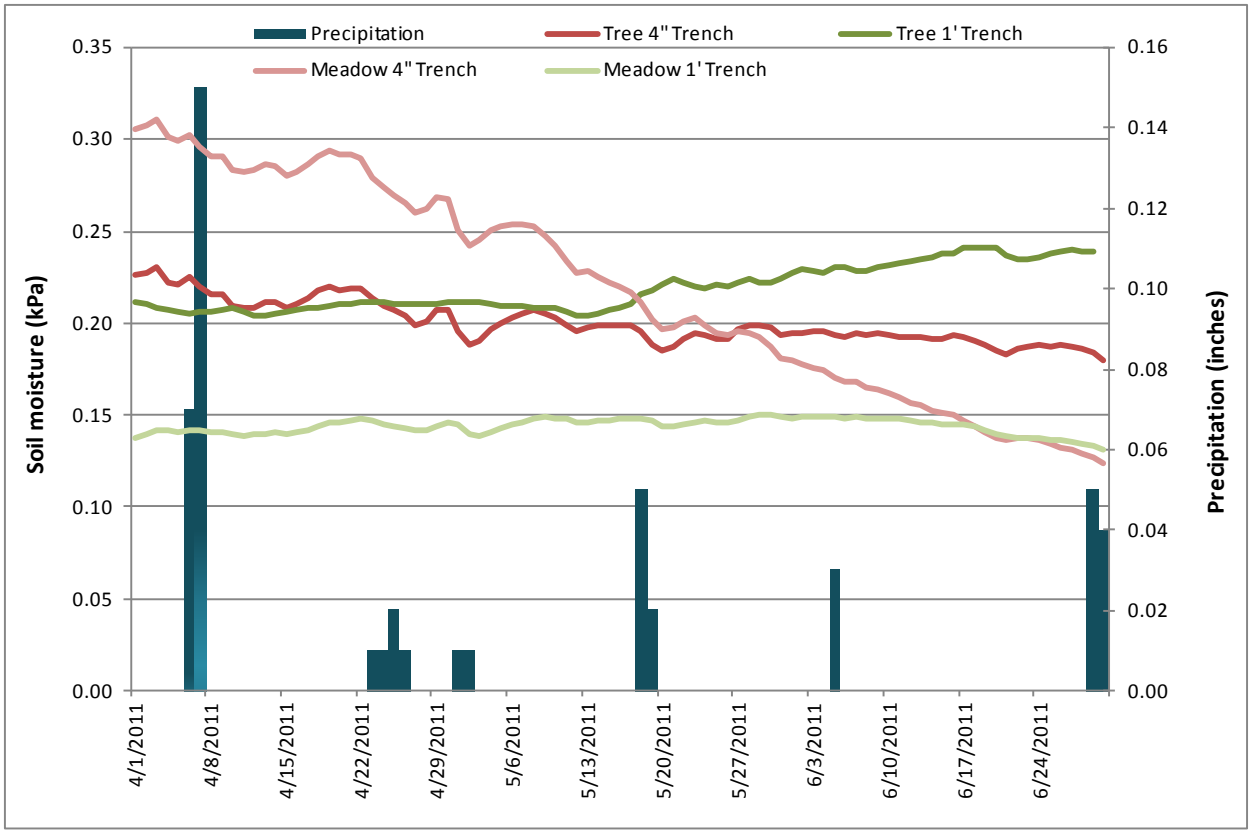

Figure 5. Comparison of Tree and Meadow soil moisture levels at the 4-inch and 1-foot depths, along with precipitation, April–June 2011.

Temperature and Relative Humidity

Figure 6 and Figure 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.

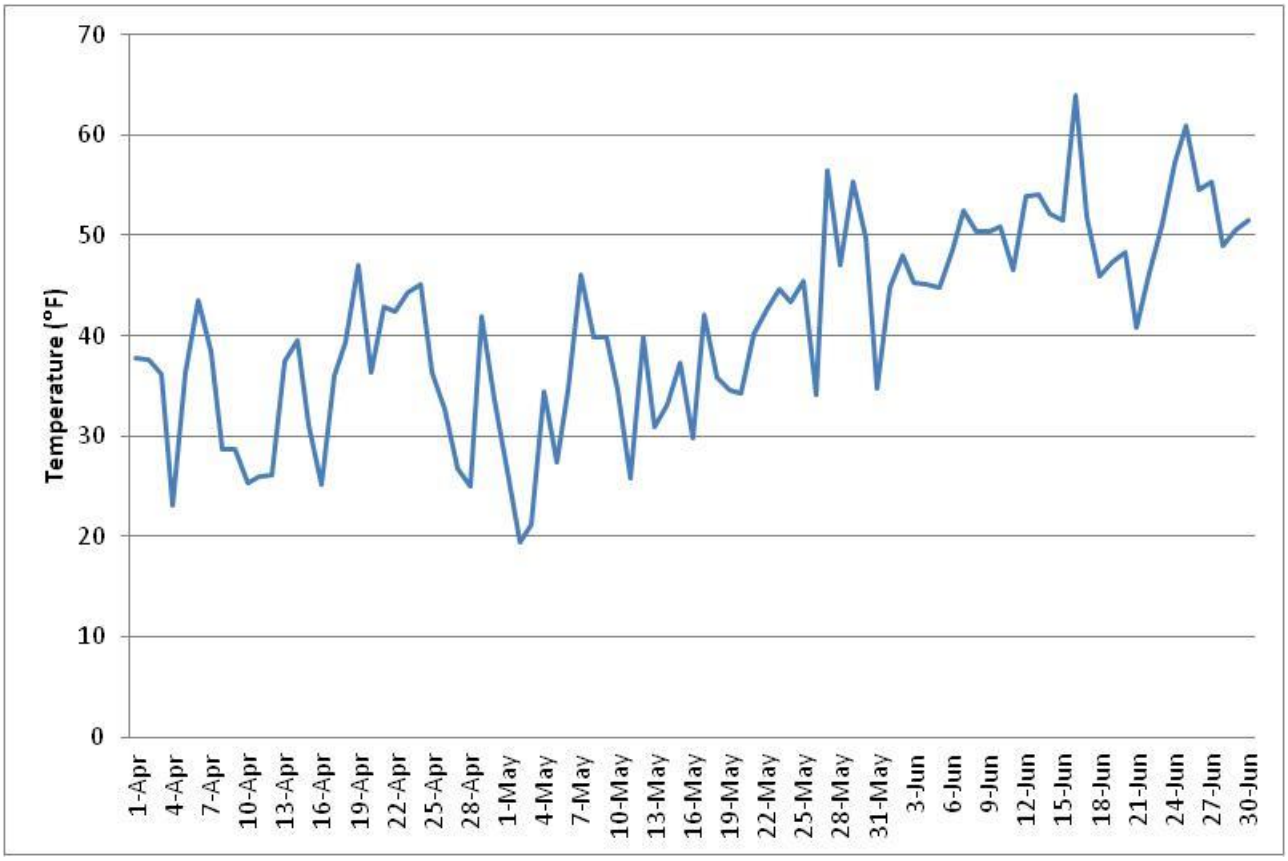

Figure 6. Daily minimum ambient temperature (degrees Fahrenheit), April–June 2011.

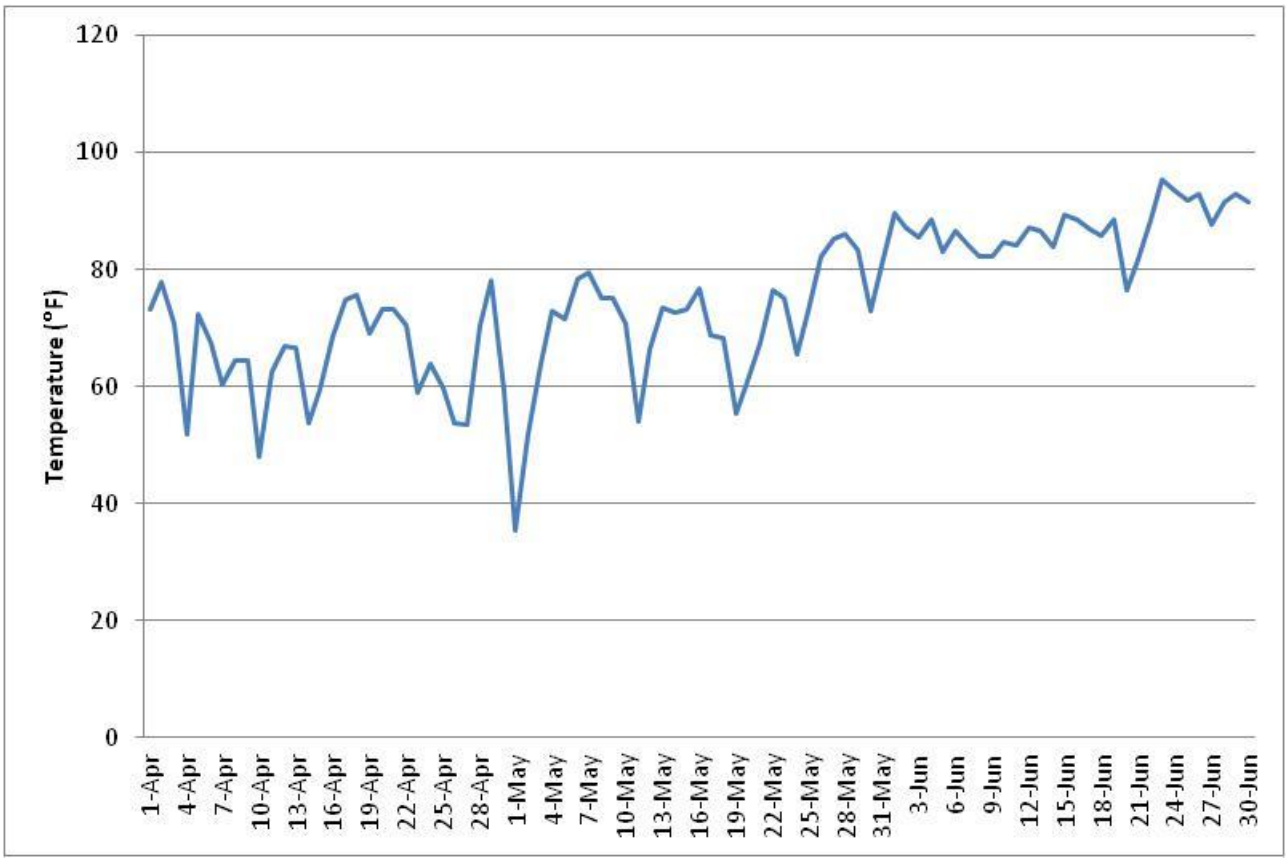

Figure 7. Daily maximum ambient temperature (degrees Fahrenheit), April–June 2011.

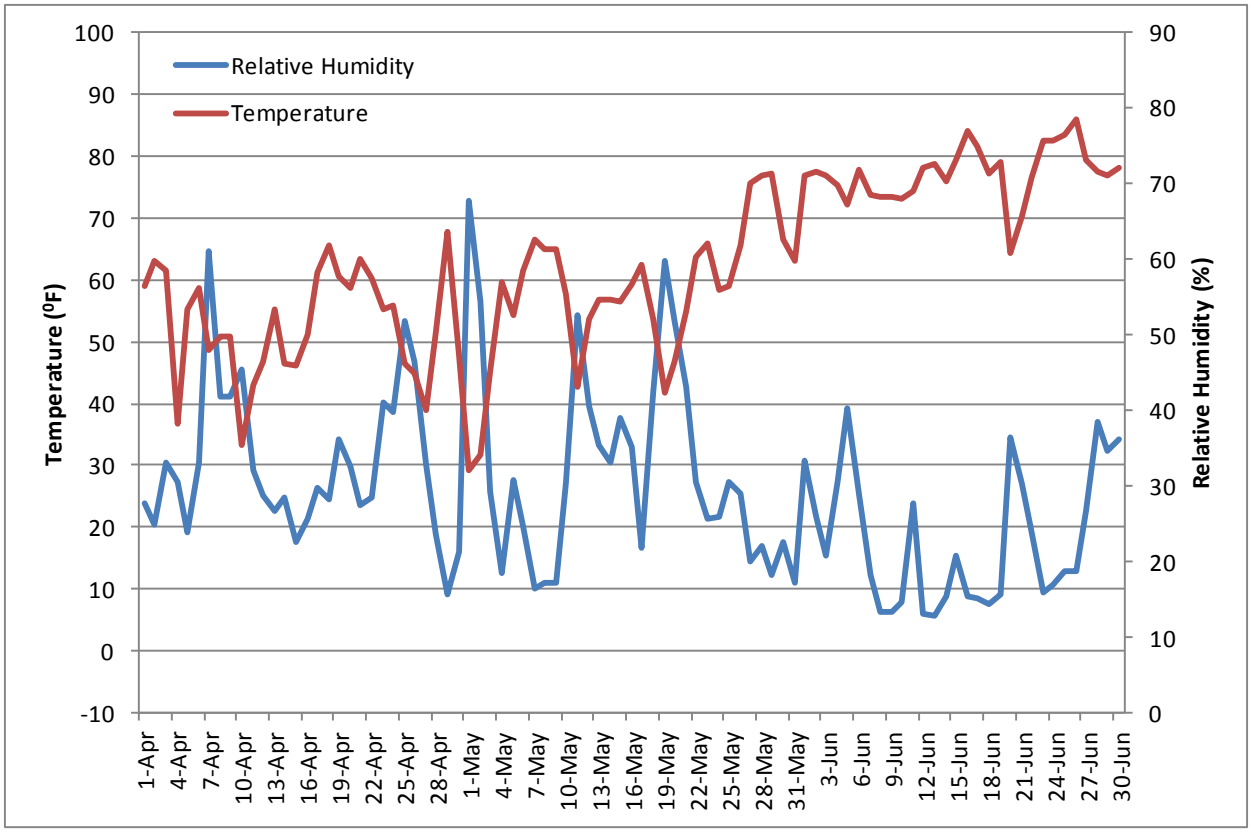

Figure 8. Average daily ambient temperature and humidity, April–June 2011.

Interpretation of Quarter 2 2011 Data

The overlay of precipitation and soil moisture showed no correlation between precipitation and soil moisture levels during the time period of April to June 2011 on either the Tree or Meadow site. This can be attributed to the lack of precipitation that occurred during Quarter 2 of 2011.

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, 2010, 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.