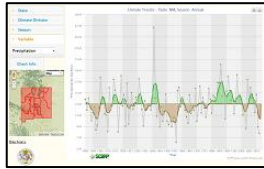# SCIPP Online Drought Tools

New Mexico Examples

1. Historical Climate Trends Tool

Description: The Historical Climate Trends Tool displays precipitation and temperature trends for the period of the instrumental record, 1895-Present. Users can view the long term average, 5-year moving average, and yearly average by state, climate division and season for any state in the United States. The data, which are provided by the National Climatic Data Center (www.ncdc.noaa.gov), are displayed via a graph and a mouse-over function allows the user to view yearly values.

How to Access the Tool: Visit the SCIPP homepage, www.southernclimate.org and click on **Data Products** on the menu bar near the top of the page (see red arrow in Figure 1). The **Historical Climate Trends Tool** is the 3rd tool listed.

Figure 1: SCIPP Homepage, www.southernclimate.org.

Selecting the Data You Want to View: Once you access the tool, there are a variety of graphs to choose from. On the left side of the screen you will see four categories: **State**, **Climate Division**, **Season**, and

Variable. As an example, choosing New Mexico, Entire State, Annual, and Precipitation will produce the following graph (Figure 2):
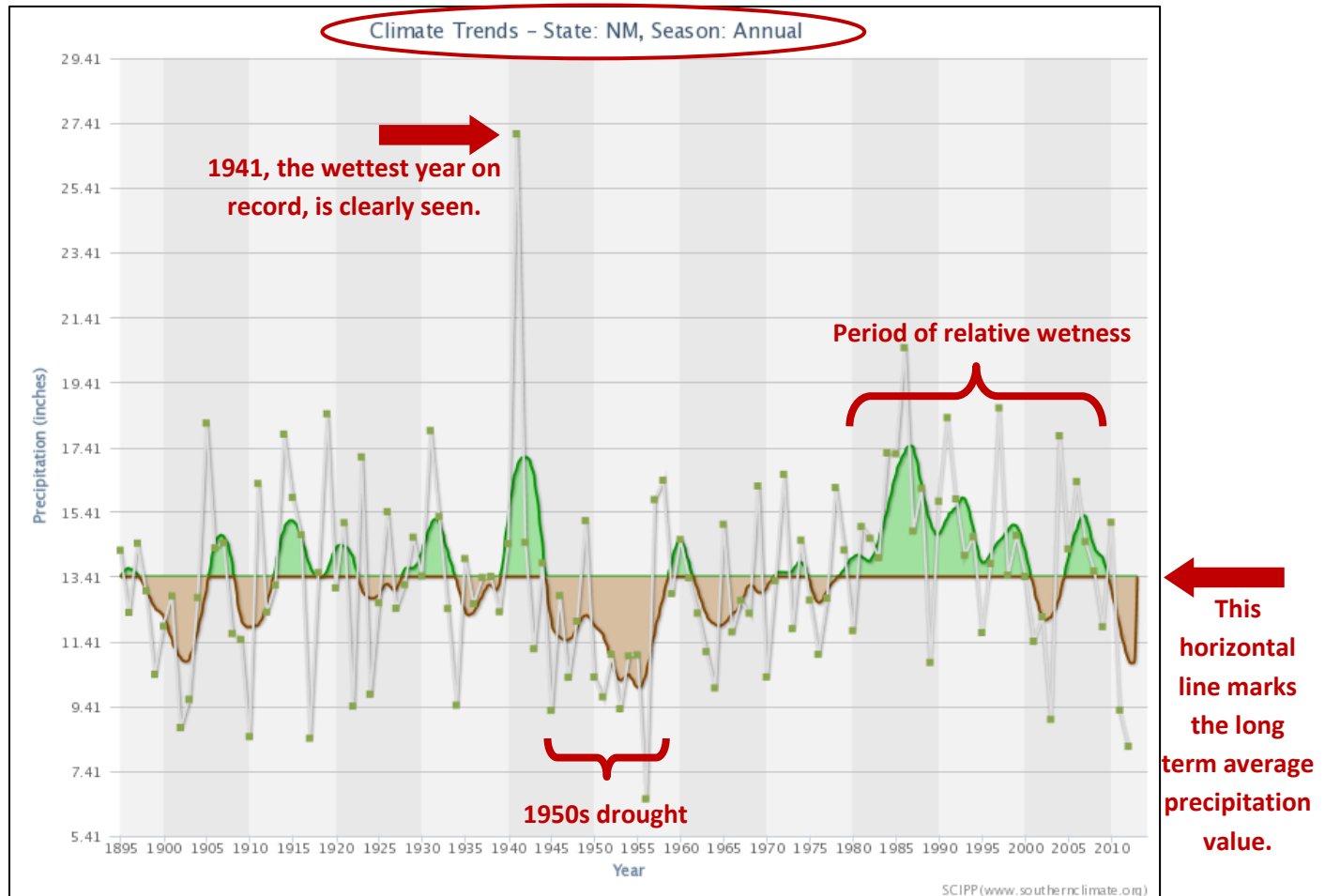

Figure 2: Graph of annual precipitation trends for New Mexico.

You notice that until fairly recently, the last 3 decades have been relatively wet. The 1950s drought is also evident on the graph. Take a look at the graph and see if any other time periods stick out to you. You may want to think about whether the data coincide with any events (e.g., a period of floods or drought) that you have experienced.

The next graph (Figure 3) shows the annual temperature trend for New Mexico. Note the warm and cool periods on the graph, which are depicted in red and blue.
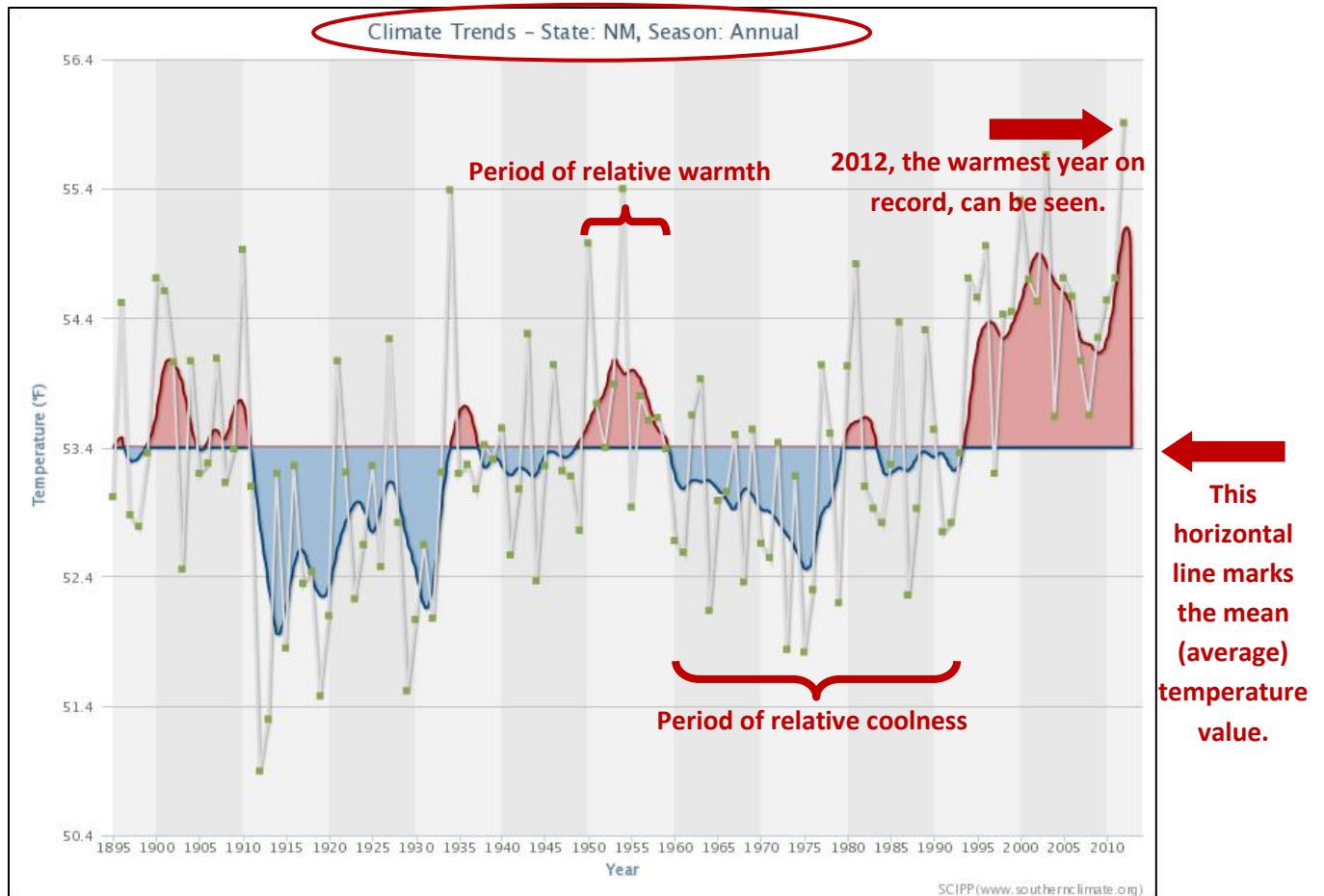
Figure 3: Graph of annual temperature trends for New Mexico.

To obtain information that is more specific to your area, you can choose to only look at the data of a single climate division. New Mexico is divided into 8 **climate divisions** (Figure 4), which are largely determined by topography.

Figure 4: New Mexico Climate Divisions (Courtesy of University of Arizona Cooperative Extension).

For example, Figure 5 shows annual precipitation data for **climate division 2** (northern mountains), which is highlighted in yellow on the small map on the left side of the figure. Another important feature is viewing the values of a single data point. When you mouse over the data points on the graph, a box will pop up that shows the value of that particular data point (e.g., 27.06 inches of rain during the year 1941).
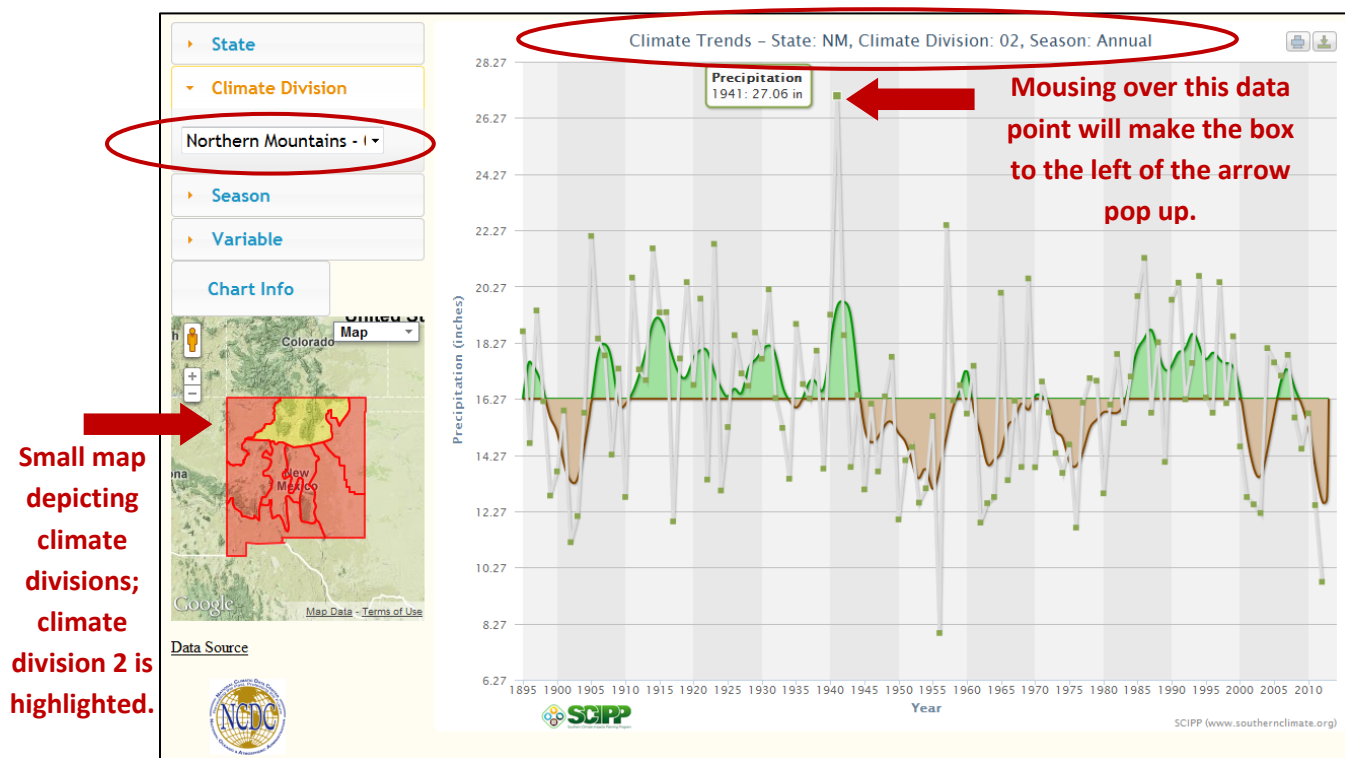

Figure 5: Example precipitation graph depicting the trend for climate division 2, the northern mountains of New Mexico.

Not only can you choose to look at data for a particular climate division, you can also look at data for a particular season or month. As an example, Figure 6 depicts the **temperature** trend for **climate division 6** (central highlands) in the **winter**.
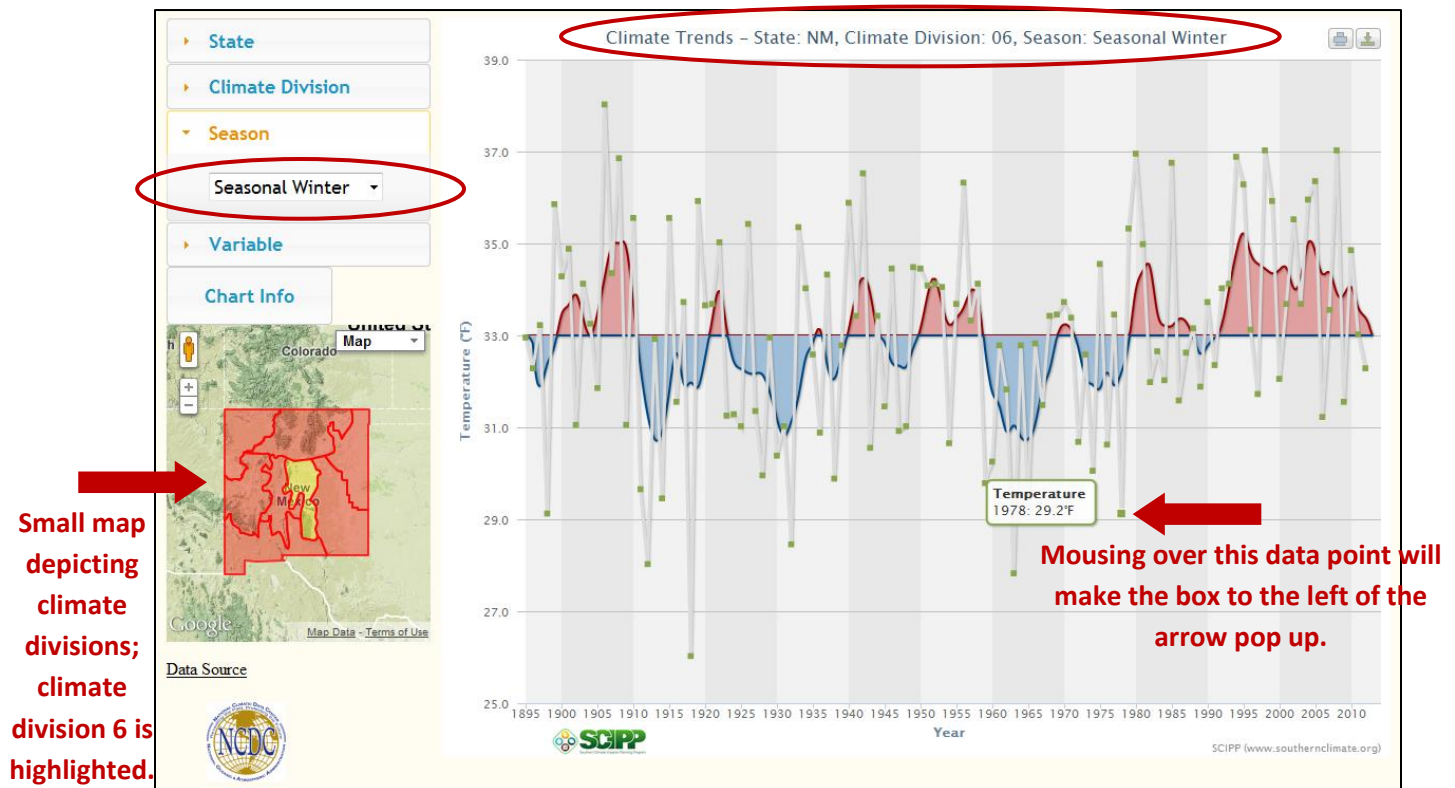

Figure 6: Winter temperature data for climate division 6, the central highlands of New Mexico.

What this tool can tell us about drought history: The Historical Climate Trends Tool depicts long term precipitation and temperature trends. Although short term climate trends (e.g., a few weeks to a few months) impact agricultural producers for example (especially those that do not rely on irrigation), long term climate trends are vital for water supplies. The annual precipitation graph clearly shows that drought is part of New Mexico's history. Our memories tend to be biased toward recent events and this tool helps put recent events in the context of a longer climatological record.

Questions? Go ahead, play around with the tool on www.southernclimate.org. See if any events in your memory (e.g., a particularly cold winter or a particularly hot summer) match up with the data. If you have any questions about how to use this tool, please don't hesitate to contact SCIPP at the University of Oklahoma at 405-325-7809 or scipp@southernclimate.org.
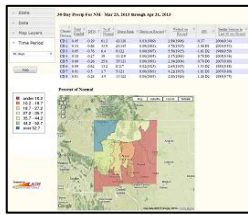
2. Southern U.S. Drought Tool

Description: The [Southern U.S. Drought Tool](#) displays information on drought severity and the amount of precipitation needed to get out of drought. The tool is useful for someone who is interested in understanding precipitation deficits, or lack thereof, over a relatively short period of time (365 days or less). Users can view precipitation statistics (e.g., rainfall total, departure from normal, % of normal, and standard precipitation index) by climate division for any state in the SCIPP region. Users can also select an end date and the time period (30, 60, 90, 180, 365 days) for which they would like to view the information. Data are provided in table and map formats, and "Normal" is based on 1971-2000 averages.

How to Access the Tool: Visit the SCIPP homepage, www.southernclimate.org and click on **Data Products** on the menu bar near the top of the page (see red arrow in Figure 7). The **Southern U.S. Drought Tool** is the 1st tool listed.

Figure 7: Top of SCIPP homepage, www.southernclimate.org.

Selecting the Data You Want to View: Once you access the tool, there are a variety of maps to choose from. On the left side of the screen you will see four categories: **State**, **Date**, **Map Layers**, and **Time Period**. *State* denotes the state (e.g., New Mexico) for which you would like data. *Date* denotes the most recent date (e.g., April 22, 2013) from which you would like to data to be pulled. *Map Layers* denotes the precipitation statistics in which you would like to view (e.g., rainfall total, departure from normal, % of normal, and standard precipitation index or SPI). *Time Period* denotes the period over which you would like the statistics to cover (e.g., 30, 60, 90, 180, or 365 days). Once you make your selection, a map will appear in addition to a table with numerical values for each climate division (Figure 8). Additional information describing the tool can be found on the **FAQ** button on the left side of the webpage.

As an example, Figure 8 shows precipitation statistics for April 22, 2012 – April 21, 2013 (365 days). The map depicts **Percent (%) of Normal**, which shows for example that CD 8 (climate division 8; southwest New Mexico) received less than 40.7% of normal precipitation over the 365 day period whereas CD 1 (northwest New Mexico) received at least 61.2% of normal precipitation over the period. The **% of**

Normal column in the table shows the exact values; 38.9% of normal for CD 8 and 65.3% of normal for CD 1. The table also contains the indices, from left to right: **Total Rainfall** over the specified period in inches, **DFN** (Departure from Normal), **% of Normal**, **Driest Rank**, **Driest on Record**, **Wettest on Record**, **SPI**, and **Similar Season in Last 30 Years**. Additional information describing the indices and what they mean can be found on the **FAQ** button on the left side of the webpage.

The **table** is useful if you would like to know the specific values of the aforementioned indices. Knowing and understanding these values may be helpful for planning purposes. For example, if you're a farmer and you know how much rain your crop typically needs in a month or a season, the table would help you determine how much more (or less) rain your crop needs to be healthy. Water managers may also find the information on the table useful if they would like to know how wet or dry a season has been. If their long-term storage (e.g., a reservoir) is at a deficit they can determine, at least climatologically speaking, how that season compares with previous seasons. The information in the table and map help put the precipitation patterns over a relatively short time span in perspective with the longer climatological record.
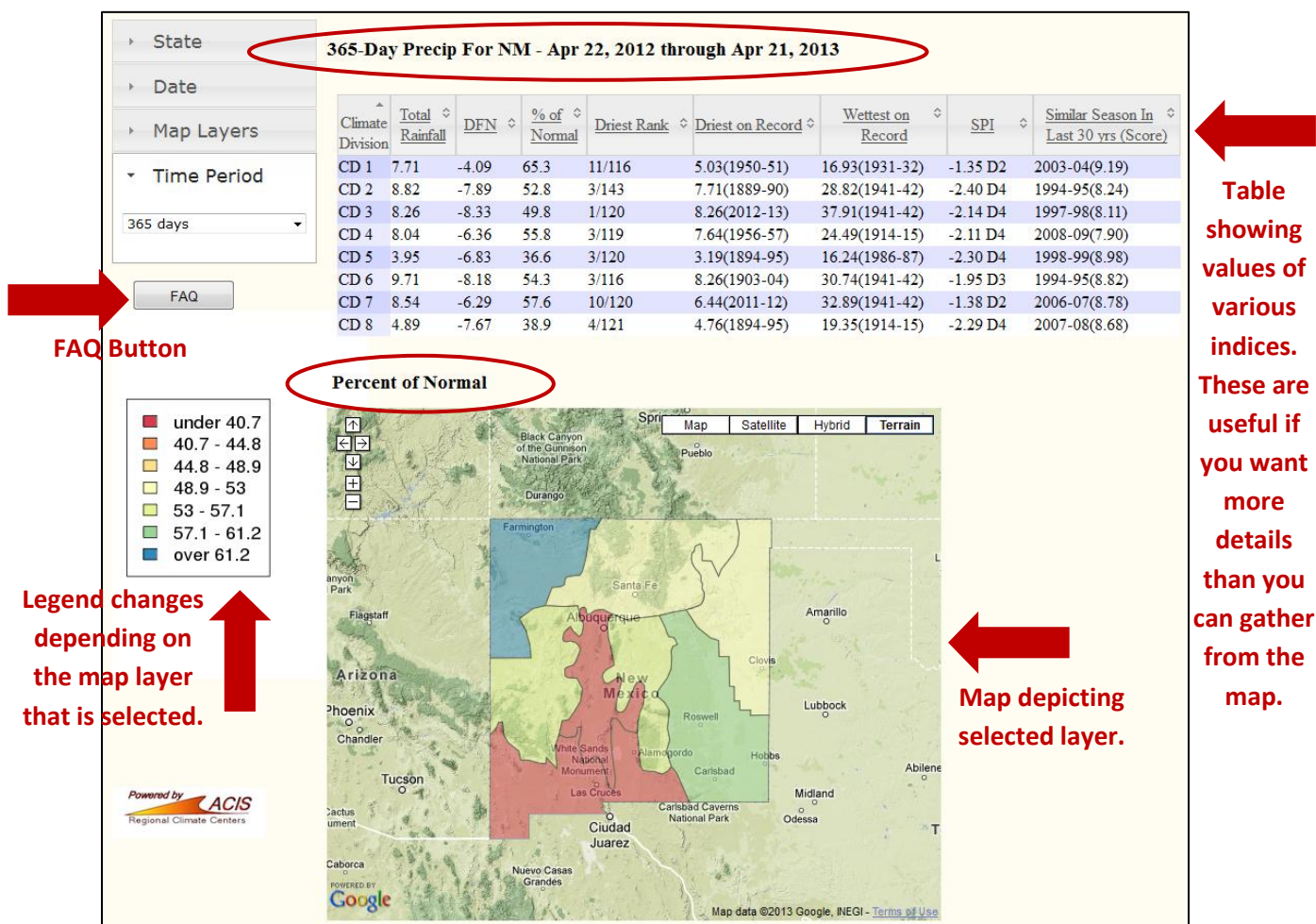

Figure 8: Example map showing % of Normal precipitation for New Mexico over a 365 day period.

Four different layers can be displayed on the map: **Rainfall Total**, **Departure from Normal**, **% of Normal**, and **SPI**. You can also zoom in and out and center the map as needed. Each time a different map layer is selected the legend changes accordingly. Note that the map colors are based on a sliding scale. As mentioned previously, all of these indices are also present in the table; the map function provides a convenient way to visualize the data.

What this tool can tell us about drought history: This tool allows the user to understand short term drought trends within the context of the long term climatological record. This information can also be useful if you are trying to understand how much above or below average the rainfall has been over a month, a particular season, or a year.

Questions? Go ahead, play around with the tool. See if any events in your memory (e.g., a particularly dry spring) match up with the data. If you have any questions about how to use this tool, please don't hesitate to contact SCIPP at the University of Oklahoma at 405-325-7809 or scipp@southernclimate.org.