

EXTREME HEAT

| | |
|------------------------------------|---|
| HAZARD DESCRIPTION | 1 |
| LOCATION..... | 1 |
| EXTENT..... | 1 |
| HISTORICAL OCCURRENCES..... | 4 |
| SIGNIFICANT PAST EVENT | 4 |
| PROBABILITY OF FUTURE EVENTS | 5 |
| VULNERABILITY AND IMPACT | 5 |

Hazard Description

Severe, excessive summer heat is characterized by a combination of exceptionally high temperatures and humidity. When these conditions persist over a period of time, it is called a heat wave. Higher than normal humidity and temperatures can cause an extreme heat event or heat wave to occur. A heat wave is a prolonged period of excessive heat, most often in very humid conditions. The National Center for Environmental Health reports from 1979 to 1999, excessive heat exposure caused 8,015 deaths in the United States.

Location

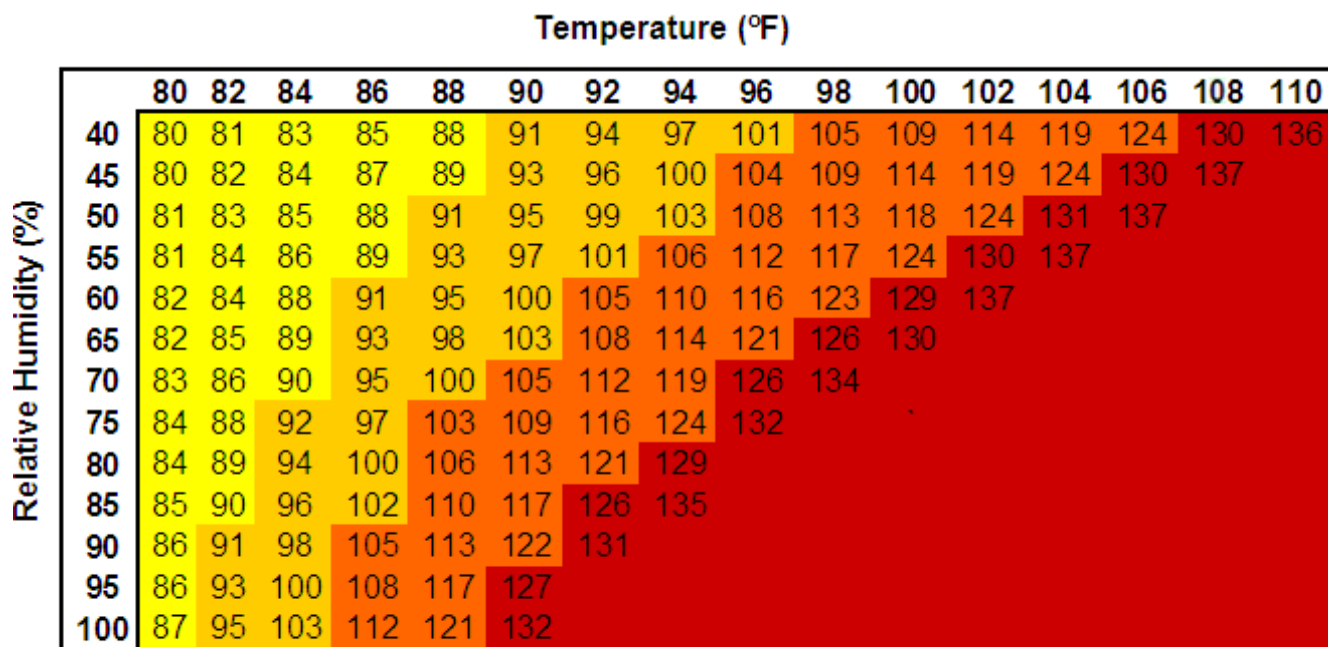
Though different temperatures for extreme heat have been recorded at various locations throughout the CVCOG Region, there is no specific geographic scope to the extreme heat hazard. Extreme heat could occur anywhere in the planning area.



Extent

The magnitude or intensity of an extreme heat event is measured according to temperature in relation to the percentage of humidity. According to the National Oceanic Atmospheric Administration (NOAA), this relationship is referred to as the “Heat Index,” and is depicted in Figure 12-1. This index measures how hot it feels outside when humidity is combined with high temperatures.

Figure 12-1. Extent Scales for Extreme Summer Heat¹



The extent scale in Figure 12-1 displays varying degrees of caution depending on the relative humidity combined with the temperature. For example, when the temperature is at 90°F or lower, caution should be exercised if the humidity level is at or above 40 percent.

The shaded zones on the chart indicate varying symptoms or disorders that could occur depending on the magnitude or intensity of the event. “Caution” is the first level of intensity where fatigue due to heat exposure is possible. “Extreme Caution” indicates that sunstroke, muscle cramps or heat exhaustion are possible, whereas a “Danger” level means that these symptoms are likely. “Extreme Danger” indicates that heat stroke is likely.

Based on the extent scale in Figure 12-1, an extreme summer heat event could occur with an air temperature as low as 80°F if the percentage of humidity was equal to or greater than 40 percent. Even though this temperature seems relatively low, given the high humidity, fatigue is possible. Citizens, especially children and the elderly should exercise caution by staying out of the heat for prolonged periods at this temperature and relative humidity. As the chart indicates fatigue is only possible, but can occur with prolonged exposure or physical activity. Citizens who work outdoors should exercise caution even at

¹ Source: NOAA

Extreme Heat

the lower temperature if the humidity is at a high degree. With prolonged exposure or physical activity fatigue could set in, causing dizziness, headaches or nausea.

Figure 12-2. Average Daily Maximum Heat Index²

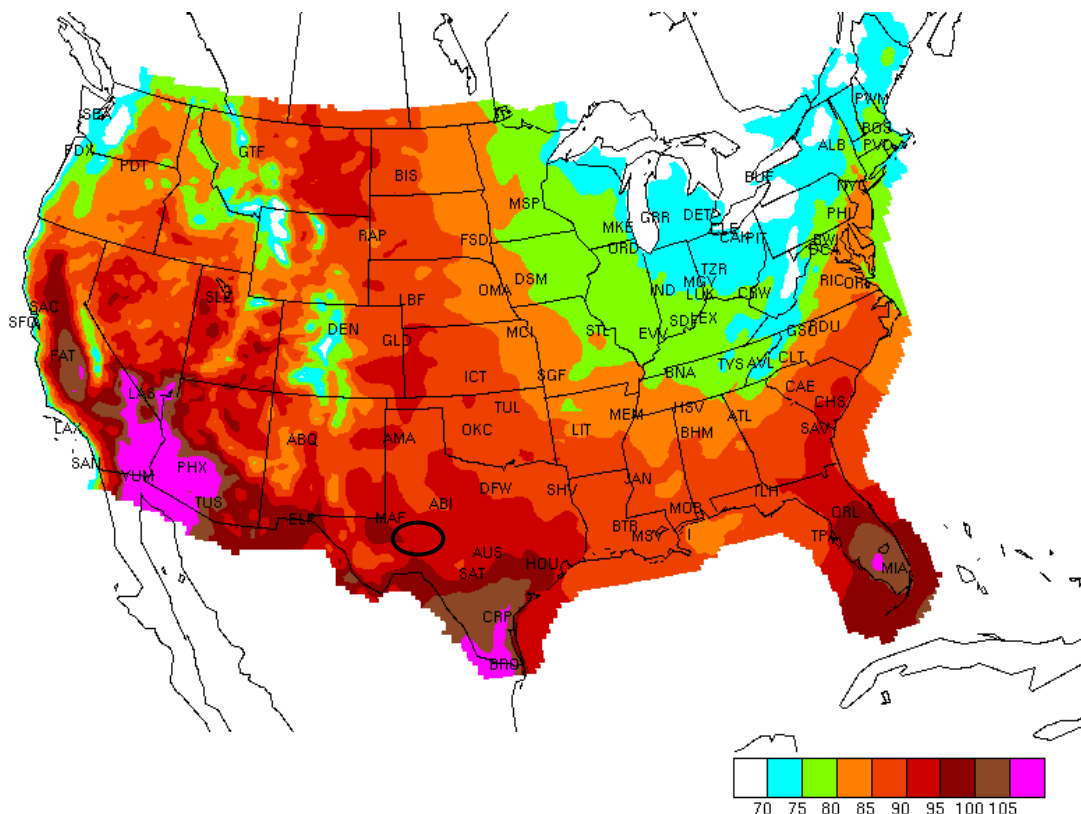


Figure 12-2 displays the daily maximum heat index as derived from NOAA based on data compiled from 1849 to 2009. Although the CVCOG Region spans 13 counties, the communities therein experience similar temperatures due to their location within the Panhandle Plains and Hill Country Regions of Texas. The dark circle on the map in Figure 12-2 shows the approximate location of the CVCOG Region. On average the daily maximum heat average is between 95-100 degrees Fahrenheit.

Based on this information the average extent for the communities in the CVCOG Region is “Danger”, which indicates that sunstroke, muscle cramps and heat exhaustion are likely. Because the CVCOG Region is affected seasonally by extreme summer heat, the extent scales provide a means for better targeting mitigation actions to protect lives. Using the extent scale in Figure 12-1 to combine heat and humidity allows officials to better predict events and more accurately warn citizens of danger.

² Source: NOAA

Historical Occurrences

According to the National Climatic Data Center (NCDC), from 1950 to 2010 one extreme heat event affected counties in the planning area. Table 12-1 below summarizes heat event related deaths in Texas for the period of 1994 to 2011. While it is difficult to discern impacts by County for a hazard whose damages are regional in scale, general characterization of extreme heat impacts can be determined and the significant historic event is profiled in this section.

Table 12-1. Extreme Heat Related Deaths in Texas

| YEAR | DEATHS |
|------|--------|
| 1994 | 1 |
| 1995 | 12 |
| 1996 | 10 |
| 1997 | 2 |
| 1998 | 66 |
| 1999 | 22 |
| 2000 | 71 |
| 2001 | 20 |
| 2002 | 1 |
| 2003 | 0 |
| 2004 | 3 |
| 2005 | 49 |
| 2006 | 2 |
| 2007 | 2 |
| 2008 | 7 |
| 2009 | 6 |
| 2010 | 4 |
| 2011 | 20 |

Significant Past Event

June 1994

It impacted 7 of the 12 counties in the study area. In June of 1994, an area of strong high pressure caused a record heat wave across West Texas. This event allowed temperatures to hold between 110 and 120 degrees through the last week in June. As a result, a 40 year-old male construction worker was killed by heat stroke and an elderly female was injured by heat stroke; both occurred in El Paso, which is adjacent to the planning area but not within

the Concho Valley COG. Unfortunately, fatalities due to extreme heat are not uncommon in the State of Texas as the table below presents.

Probability of Future Events

Based on reports of events, the planning area can expect a frequency of return that is probable within the ten years. The likelihood of occurrence of excessive summer heat event in the CVCOG Region is unlikely. Extreme drought conditions and above-average temperatures for 2009 and 2010 have affected all of the participating jurisdictions' probability of experiencing an extreme heat event. In the past, multiple counties throughout the region have issued burn bans to prevent the occurrence of wildfires due to extreme heat and dry conditions.

Vulnerability and Impact

There is no defined geographic boundary for excessive summer heat events. While all of the planning area is exposed to extreme temperatures, existing buildings, infrastructure and critical facilities are not considered vulnerable to significant damage caused by extreme heat events. Therefore, any estimated property losses associated with these hazards are anticipated to be minimal across the area. However, extreme temperatures do present significant life and safety threats to the population and to agriculture in the CVCOG Region. As a result, excessive summer heat deserves mitigation consideration by the participating jurisdictions.

Due to the limited variance in terms of average days of heat for jurisdiction, it is difficult to state with accuracy detailed variables among participating communities in terms of vulnerability. However, the major human risks associated with severe summer heat include: heat cramps; sunburn; dehydration; fatigue; heat exhaustion; and even heat stroke. The most vulnerable population to heat casualties are children and the elderly or infirmed, who frequently live on low fixed incomes and cannot afford to run air-conditioning on a regular basis. This population is sometimes isolated, with no immediate family or friends to look out for their well-being. Another segment of the population at risk is those whose jobs consist of strenuous labor outdoors. Livestock and crops can also become stressed, decreasing in quality or in production, during times of extreme heat.

Loss estimates due to extreme heat total \$350,000 for the planning area, which may include damages from other counties that are in the impact area but not in the planning area. Similarly, deaths from extreme heat cannot be specified.

The potential impact of excessive summer heat for the CVCOG Region is limited, resulting in few, if any, injuries. Injuries and illness are expected to be treatable with first aid, critical facilities and emergency services would not be expected to be shut down though no

Extreme Heat

more than 24 hours in the worst case. No property damage is expected though crop damages are more commonly the results of prolonged extreme heat events.