

# HURRICANE

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## Hazard Description

According to the National Oceanic and Atmospheric Administration (NOAA), a hurricane is an intense tropical weather system of strong thunderstorms with well-defined surface circulation and maximum sustained winds of 74 mph or higher. In the Northern Hemisphere circulation of winds near the Earth’s surface is counterclockwise.

Hurricanes often begin as tropical depressions that intensify into tropical storms when maximum sustained winds increase to between 35-64 knots (39 – 73 mph). At these wind speeds, the storm becomes more organized and circular in shape and begins to resemble a hurricane. Tropical storms can be equally problematic without ever becoming a hurricane, resulting in high winds and heavy rainfall, as Tropical Storm Erin did for Crockett County in August 2007. Once sustained winds reach or exceed 74 mph, the storm becomes a hurricane. The intensity of a land falling hurricane is expressed in categories relating wind speeds and potential damage. Tropical storm-force winds are strong enough to be dangerous to those caught in them.

## Location

Although all of the counties in the CVCOG Region are located inland from the coast, they are still susceptible to the indirect threats of a hurricane, including high winds and flooding. The planning area is outside of the hurricane wind speed hazard areas and is approximately 100 miles northwest of San Antonio, which is the inland extremity of hurricane wind hazard zones. Due to the location outside of the hazard areas, the CVCOG has played host to coastal area residents who evacuate during hurricane events. Location of previous hurricane tracks is shown in Figure 14-1.

## Extent

Hurricanes are categorized according to the strength and intensity of their winds using the Saffir-Simpson Hurricane Scale (See Table 14-1). A Category 1 storm has the lowest wind speeds, while a Category 5 hurricane has the highest. This scale only ranks wind speed, but lower category storms can inflict greater damage than higher category storms depending on where they strike, the amount of storm surge, other weather they interact with and how slow they move.

**Table 14-1. Extent Scale for Hurricanes<sup>1</sup>**

CATEGORY	MAXIMUM SUSTAINED WIND SPEED (Mph)	MINIMUM SURFACE PRESSURE (Millibars)	STORM SURGE (Feet)
1	74-95	Greater than 980	3-5
2	96-110	979-965	6-8
3	111-130	964-945	9-12
4	131-155	944-920	13-18
5	155+	Less than 920	19+

Based on the historical storm tracks for hurricanes and the location of the CVCOG Region outside of the hurricane wind hazard area, the average extent to be mitigated for is a Category 1 storm for the communities in the planning area.

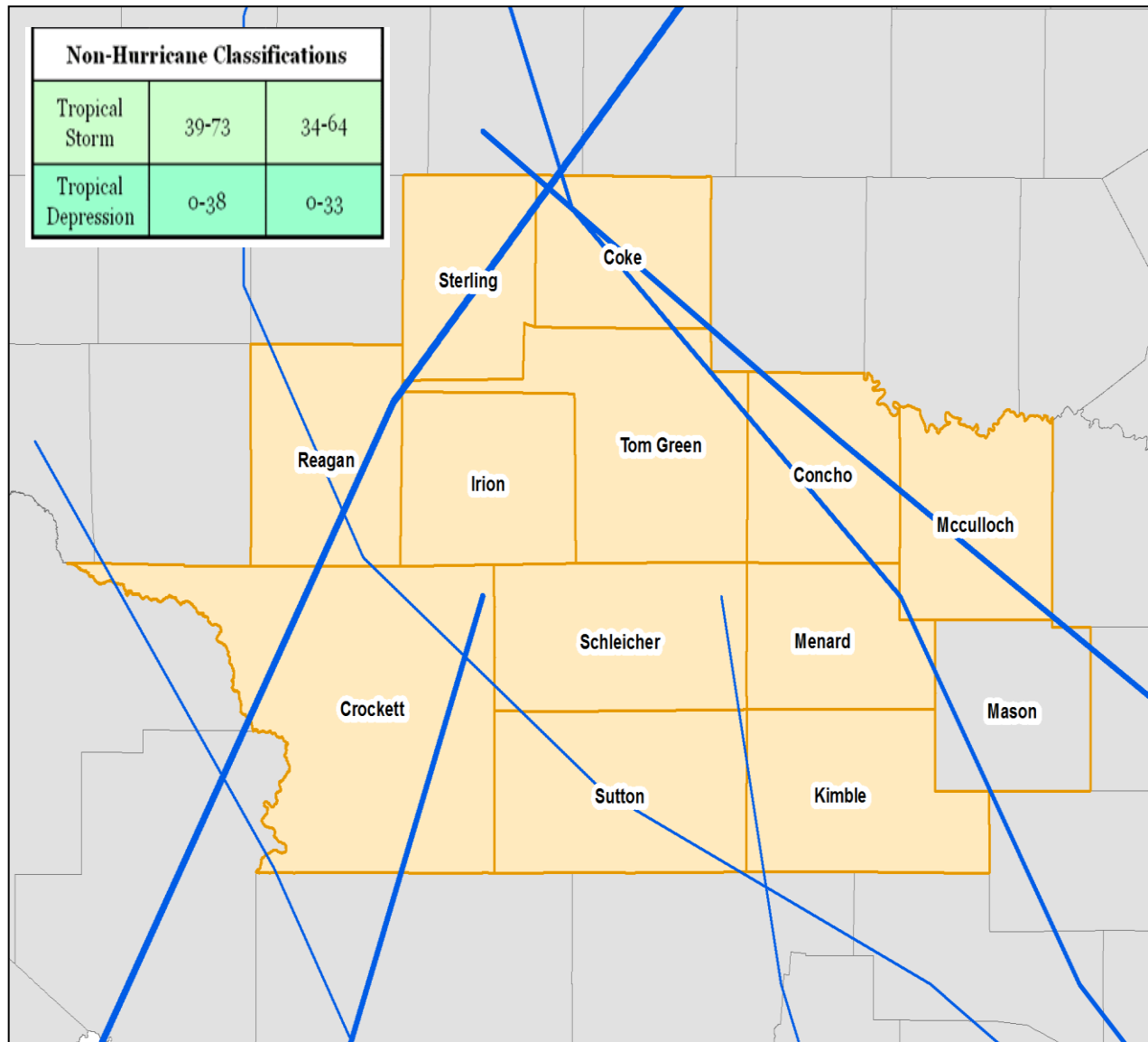
## Historical Occurrences

Although hurricanes and tropical storms have made landfall at various magnitudes (categories) in the Concho Valley area, the storms have usually weakened to tropical storms or depressions by that time, being near the end of their life cycle. With the storms having reduced winds, extreme rainfall is the hazard of concern. In Figure 14-1 below, hurricane track widths are reflective of their strength at their strongest magnitude at any location. Table 14-2 lists the storms shown to have a track through the planning area in Figure 14-1.

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<sup>1</sup> Source: National Hurricane Center

Figure 14-1. Location of Historic Storm Tracks<sup>2</sup>



<sup>2</sup> Source: NOAA/National Hurricane Center

**Table 14-2. Historic Storms**

YEAR	STORM NAME	CATEGORY
1851	Not Named	Tropical Storm
1880	Not Named	Category 4
1893	Not Named	Category 2
1942	Not Named	Category 3
1958	Alma	Tropical Storm
1988	Gilbert	Category 5
2007	Erin	Tropical Storm

## Significant Past Event

### 16 August 2007

This event affected 10 of the 12 counties in the planning region. The remnants of Tropical Depression Erin slowly moved through the Concho Valley Region, dropping around three to seven inches of rain across a large portion of the area. Over nine inches of rain fell near the rural areas of southeastern Crockett County. Wind gusts up to 42 knots (48 mph) and a minimum seal-level pressure of 1007 mb were reported at Junction. Flash flooding closed many roads and caused one fatality. River and creek flooding damaged hundreds of homes.

## Probability of Future Events

Based on historical occurrences and the infrequency of significant hurricane wind events, the probability of future events is unlikely, with an event no more frequent than every 10 years.

## Vulnerability and Impact

Hurricane-force winds can cause major damage to large areas; hence all existing buildings, facilities and populations are equally exposed and vulnerable to this hazard and could potentially be impacted. Warning time for hurricanes has lengthened due to modern and early warning technology. Hurricane-force winds can easily destroy poorly constructed buildings and mobile homes, as well as debris such as signs, roofing materials, and small items left outside become extremely hazardous in hurricanes and tropical storms. Extensive damage to trees, towers, and underground utility lines (from uprooted trees) and fallen poles cause considerable civic disruption.

Storm track data was available for the past 150 years; however, property and crop loss data is only available from 1950 to the present. Annual loss estimates were based on the 60 year reporting period for such damages. The average annual loss estimate for counties in the planning region is approximately \$278,000.

Table 14-3. Historic Loss Estimates

COUNTY	NUMBER OF EVENTS	PROPERTY DAMAGE (2009 \$\$)	CROP DAMAGE (2009 \$\$)
Coke	0	-	-
Concho	0	-	-
Crockett	4	\$25,825,193	\$5,968,759
Irion	1	\$3,601,153	\$369,848
Kimble	3	\$22,224,040	\$5,598,911
McCulloch	0	-	-
Menard	3	\$22,224,040	\$5,598,911
Reagan	1	\$3,601,153	\$369,848
Schleicher	4	\$25,825,193	\$5,968,759
Sterling	1	\$3,601,153	\$369,848
Sutton	4	\$25,825,193	\$5,968,759
Tom Green	1	\$3,601,153	\$369,848
<b>TOTALS FOR STUDY AREA</b>	<b>(4 unique)</b>	<b>\$166,911,762</b>	

The potential severity of impact from a hurricane for the CVCOG Region is classified as limited; injuries would be treatable with first aid, critical facilities would not be shut down for more than 24 hours, and less than 10 percent of property would be destroyed.