

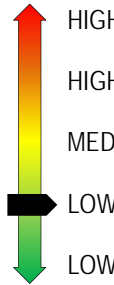
The background of the slide is a photograph of a bright sun in a yellow and orange sky with clouds. The sun is a large, bright white circle on the right side of the image, partially obscured by a dark blue semi-circle. The sky is a gradient of yellow and orange, with some clouds visible. The overall mood is hot and bright.

Extreme Heat

Extreme heat is defined as three or more consecutive days with daytime temperatures of 90°F or higher and nighttime temperatures no lower than 85°F, accompanied by high humidity.

2.0 RISK ASSESSMENT

2.2.5 Extreme Heat

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 <p>Vulnerability</p>	Period of Occurrence:	June-September	Hazard Index Ranking: Low
	Warning Time:	24-48 Hours	State Risk Ranking: Not Ranked
	Probability:	Remote (unlikely to occur on annual basis)	Severity: Critical (25-50% of land area affected)
	Type of Hazard:	Natural	Disaster Declarations: None

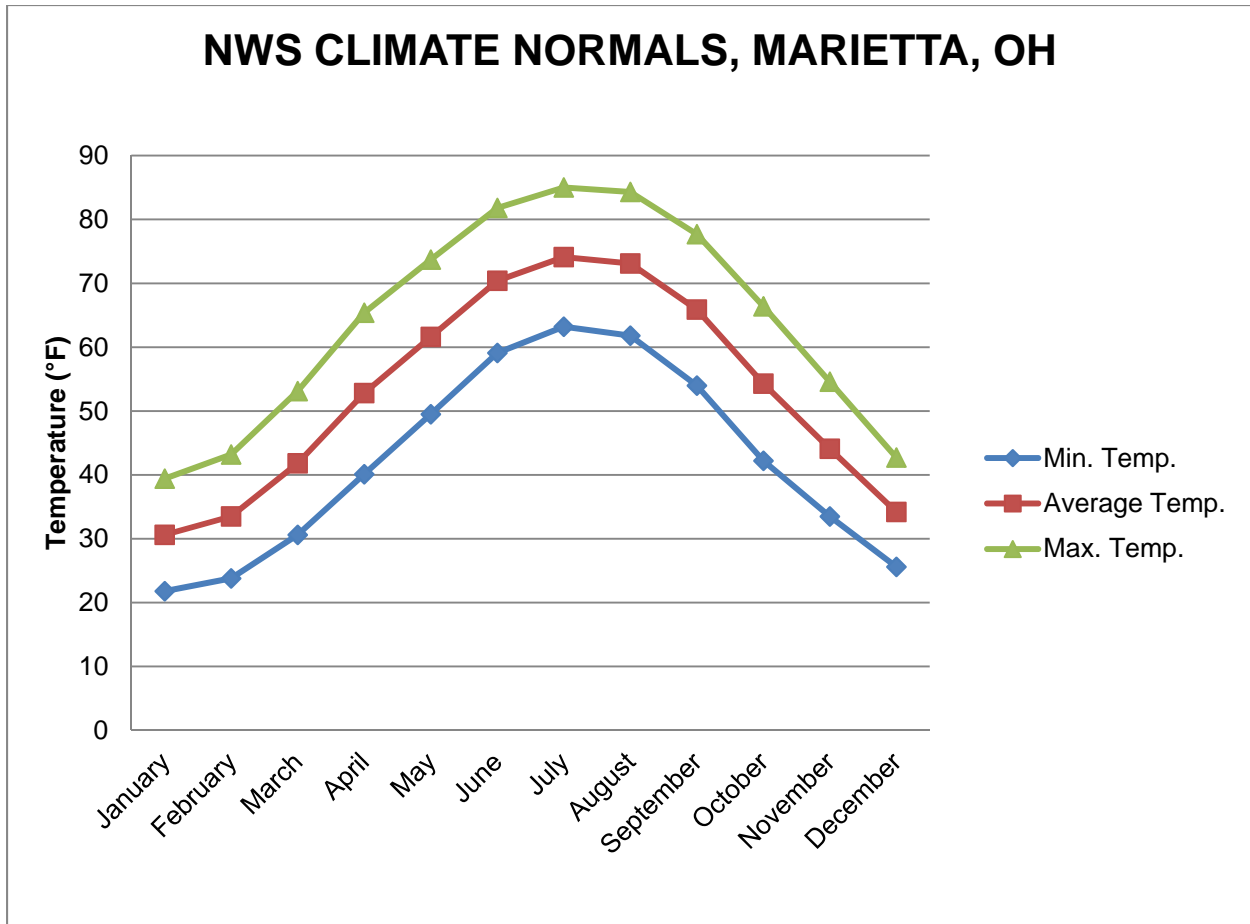
Hazard Introduction and Overview

Extreme heat is a hazard usually found in more desert regions than Washington County, Ohio. However, extreme heat can and has been a hazard in Ohio, causing heat stroke to occur to residents and providing detrimental to crops. Health hazards related to extreme heat include sunburns, heat cramps, heat exhaustion, and heat stroke. In a normal year, approximately 175 Americans die from exposure to extreme heat. Young children, elderly, and those who are sick or overweight are more likely to become victims. According to 2019 census estimates from the U.S. Census Bureau approximately 22% (13,180 people) of the total population of Washington County is 65 years of age and over. Men are more susceptible to heat related illnesses because they perspire more than women, quickening the rate at which they become dehydrated.

Location and Extent

The highest reported temperature in Ohio through the year 2020 was 113°F, this occurred on July 21, 1934 and was reported in the southeastern portion of the state near Washington County. Extreme temperature events will affect each jurisdiction in Washington County essentially equally. Although temperatures may vary slightly throughout the county, the average temperatures and extent of extremes are very similar. The following figure depicts the National Weather Service average temperatures from the NWS station in Marietta. As noted, temperatures are highest from June to August, and lowest from December to February.





To give a warning for extreme temperatures, the National Weather Service, in collaboration with local partners, issues several temperature-related products as conditions warrant. The table below describes these products for both heat and cold temperatures

NATIONAL WEATHER SERVICE TEMPERATURE-RELATED PRODUCTS	
<i>Product</i>	<i>Description</i>
Excessive Heat Warning	Issued within 12 hours of extremely dangerous heat conditions. Issued when the maximum heat index temperature is expected to be 105°F or higher for at least two days and night time air temperatures will not drop below 75°.
Excessive Heat Watch	Issued when conditions are favorable for an excessive heat event in the next 24 to 72 hours. Officials use a watch when the risk of a heatwave has increased, but its occurrence and timing is still uncertain.
Heat Advisory	Issued within 12 hours of the onset of extremely dangerous heat conditions. This Advisory is issued when the maximum heat index temperature is expected to be 100°F or higher for at least two days, and nighttime temperatures will not drop below 75°.
Excessive Heat Outlook	Issued when the potential exists for an excessive heat event in the next 3-7 days. It provides information to those who need considerable lead time to prepare for an event.

Source: National Weather Service



Hazard Impacts

Extreme temperatures tend to affect the population’s health rather than infrastructure. The extent of damage to infrastructure consists of broken pipes and cracks in the pavement due to expansion/contraction during extreme cold events and power outages during both extreme heat and cold events.

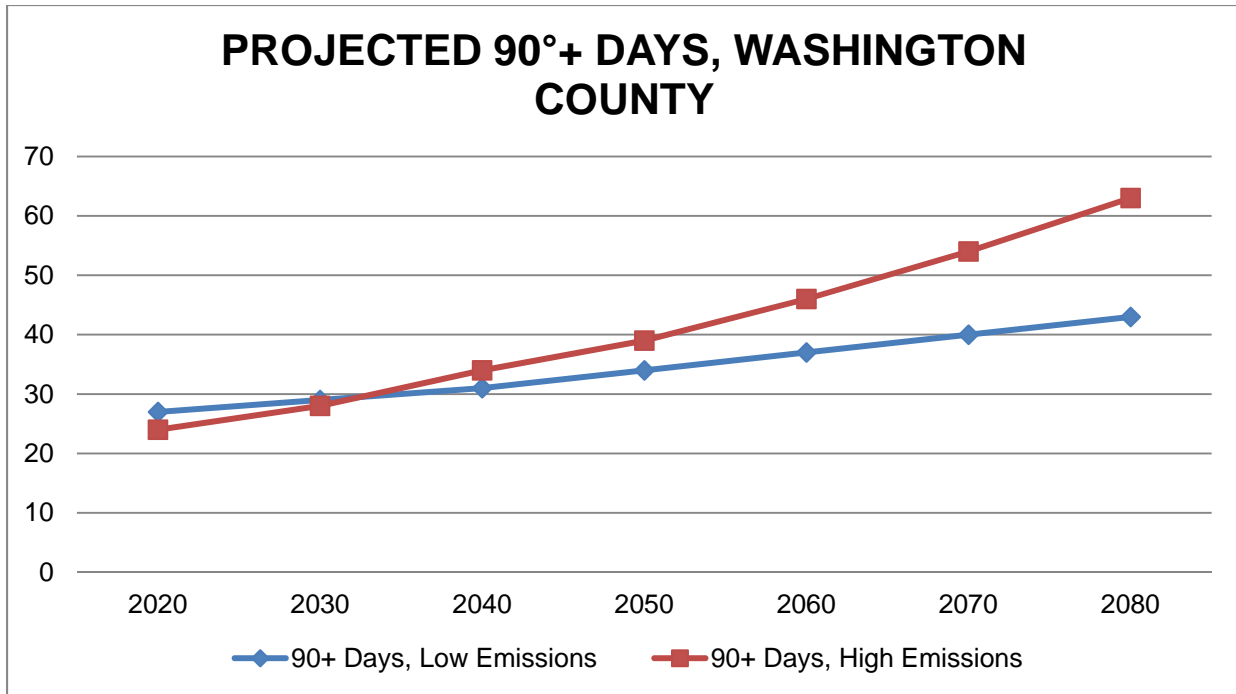
Extreme heat has a variety of impacts on human health at the individual level. Exposure to high temperatures can trigger a variety of heat stress conditions such as heart attack, stroke, heat exhaustion, heat cramps, sunburn, and heat rash. When combined with high relative humidity, heat exacerbates these conditions. High humidity also reduces the ability of sweat to evaporate from the skin. Prolonged exposure to heat may necessitate medical intervention, and in extreme cases cause death. The following table presents human health risk by heat index temperature.

HEAT RISKS	
<i>Heat Index</i>	<i>Possible Heat Disorders for People in High-Risk Groups</i>
80°F-90°F	Fatigue possible with prolonged exposure to physical activity
90°F -105°F	Sunstroke, heat cramps, or heat exhaustion possible with prolonged exposure and/or physical activity
105°F -130°F	Sunstroke, heat cramps, or heat exhaustion likely, and heatstroke possible with prolonged exposure and/or physical activity
130°F +	Heat/Sunstroke highly likely with continued exposure
Source: https://nws.weather.gov/blog/nwsdesmoines/2014/06/06/iowa-heat-awareness-day-june-5-2014-2/	

Individuals most likely to experience the negative effects of extreme heat include those 65 years and older, children younger than two, and people with chronic diseases (CDC, 2018). These individuals should limit outdoor activity during the warmest parts of the day and wear appropriate clothing and sun protection.

Human behavior can impact the occurrence of extreme temperatures. In an effort to predict future occurrences of extreme heat (in this case, using 90 degrees Fahrenheit as the indicator for extreme heat), the Center for Disease Control and Prevention (CDC) constructed a map projecting the number of extreme heat days by county using both a low and high-emissions scenario. The following table predicts the number of 90+ degree days in Washington County from 2020-2080 for both low and high emissions situations. As shown, the number of days with 90 degree temperatures will likely increase each year, but with higher emissions there are likely to be more days with extreme high temperatures.





Washington County Hazard Mitigation Plan

Vulnerable Population Concentrations

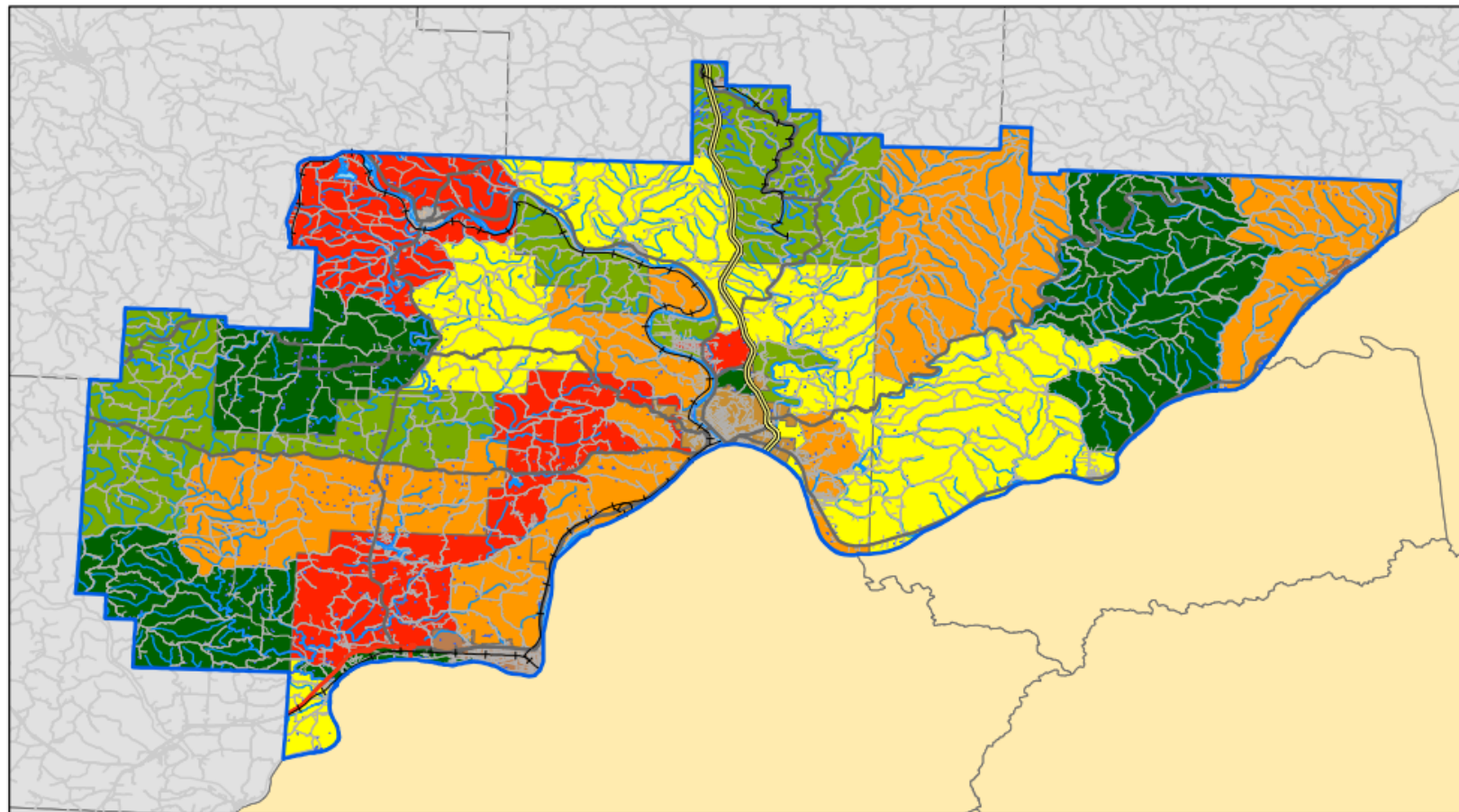
Data Source(s):
US Census Bureau

DISCLAIMER: Data is meant for use as reference only. Some sources may be intended to be used at national or regional scales and are thus used beyond their original intent for demonstrative purposes.



Populations-Under 19 & Over 65

- 108 - 249 persons
- 250 - 367 persons
- 368 - 531 persons
- 532 - 642 persons
- 643 - 936 persons



Historical Occurrences

The National Center for Environmental Information (NCEI) Storm Event Database maintains records of extreme temperature occurrences. The following table presents the NCEI extreme temperature events for Washington County.

HISTORICAL EXTREME HEAT OCCURRENCES – WASHINGTON COUNTY					
<i>Date</i>	<i>Event Type</i>	<i>Deaths</i>	<i>Injuries</i>	<i>Property Damage</i>	<i>Crop Damage</i>
09/14/1998	Extreme Heat	0	0	\$0	\$0
07/20/2011	Extreme Heat	0	0	\$0	\$0
07/28/2011	Extreme Heat	0	0	\$0	\$0
06/19/2018	Extreme Heat	0	0	\$20,000	0
TOTAL		0	0	\$20,000	\$0

Source: NCEI Storm Events Database

As shown in the above table, there have been four instances of extreme heat in Washington County since 1998. This gives an average of 0.18 extreme heat events per year.

Countywide Extreme Heat – September 14, 1998

The hottest temperatures of the summer occurred, temperatures reached the mid and upper 90s. Preliminary cooperative observations recorded 95°F in Marietta. The dry weather pattern during the late summer contributed to this unusual mid-September heat.

Countywide Extreme Heat – July 20, 2011

Heat and humidity levels peaked on the 20th, with high temperatures in the mid-90s common, the hottest temperatures were near the Ohio River. Overnight low temperatures ranged mostly from 70 to 75°F for a few hours near dawn, dew points peaked mostly in the mid and upper 70s, the heat index or apparent temperature reached around 105°F with high humidity levels.

Countywide Extreme Heat – June 19, 2018

During a three day period of very hot temperatures, a section of Interstate 77 (I-77) buckled in Washington County. The northbound lanes of I-77 near mile marker 10, or Highland Ridge Road) buckled due to heat. The road was closed for several hours as emergency repairs were made.



Loss and Damages

According to the NCEI Storm Events Database, there has been one instance of extreme heat that resulted in \$20,000 in property damage. Prolonged extreme heat caused a segment of the northbound lanes of I-77 to buckle. The hazard of extreme heat is not likely to result in losses associated with property damage; however, can result in losses associated with heat-related illnesses.

Vulnerability Assessment

This section summarizes Washington County's vulnerability to extreme heat. Washington County conducted an online survey for the public to share its thoughts on the hazard of extreme heat. The following table presents the results of that survey.

PUBLIC SENTIMENT, EXTREME HEAT – WASHINGTON COUNTY					
Hazard	Level of Concern				Total Responses
	Not at All	Somewhat	Concerned	Very	
Extreme Heat	7 (19.44%)	19 (52.78%)	9 (25%)	1 (2.78%)	36
In the past ten years, do you remember this hazard occurring in your community?				19 (52.78%)	36
Have you noticed an increase in the occurrences or intensity of this hazard?				15 (41.67%)	36
Have you noticed a decrease in the occurrences or intensity of this hazard?				0 (0.00%)	36

Source: Online Public Survey Results

The following table assigns point totals based on the research presented in this profile for each category that appears in Ohio EMA's Mitigation Information Portal (MIP) tool.

EXTREME HEAT VULNERABILITY SUMMARY			
Category	Points	Description	Notes
Frequency	2	Low	Washington County has experienced four extreme heat events since 1998, for an average of 0.18 events per year.
Response	2	One day	Extreme heat events do not warrant an extended emergency response.
Onset	1	Over 24 hours	Current technology can predict extreme heat events up to 24 hours prior to the onset of the event.
Magnitude	3	Critical (25-50% of land area affected)	Extreme temperature events are widespread events that typically affect entire regions.
Business	1	Less than 24 hours	Businesses and critical facilities would not typically be interrupted during an extreme heat event.
Human	2	Low (some heat related illnesses)	Extreme heat can cause or exacerbate illnesses, particularly in vulnerable populations.
Property	1	Less than 10% of property affected	Property damage due to extreme heat is unlikely.
Total	12	Low	

