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Welcome to the fall 2021 edition of The North Coast Observer! In this issue, you'll find articles on the record-breaking heat across the interior during the months of June and July, a downburst in Weaverville at the end of July, and information on fall weather safety. In addition, there is information on an upcoming lunar eclipse in the Astronomy Corner.

As Northwest California once again transitions into fall, the weather focus will shift to increasing rains and, eventually, mountain snows. However, until more widespread rains occur, the fire weather threat will remain, particularly across the southern portion of the area. Stay tuned for the latest forecasts, watches, and warnings. If you haven't already, make sure you follow us on social media (links below).



Follow Us on Social Media!

Website	weather.gov/eureka
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Twitter	twitter.com/NWSEureka
Instagram	instagram.com/NWSEureka

Upcoming Events

Date	Event
Oct 15	Growing season ends in zones 102,105-108
Oct 31	Growing season ends in zones 110-115
Nov 7	Daylight Saving Time ends at 2:00 AM
Nov 15	Growing season ends in coastal zones
Dec 1	Meteorological winter begins
Dec 21	Winter solstice at 7:59 AM

Record Heat in June & July

by Matthew Kidwell

Persistent high pressure over the western United States this summer brought some of the warmest temperatures ever recorded in June and July of 2021. Numerous daily high temperature records were reported, especially at the locations farther away from the coast. This time period was notable not only for how hot it was, but for the persistence of the heat. All three of our current climate stations in the interior tied or recorded the highest ever average of maximum temperatures in June and July.

Record High Temperatures

Trinity River Hatchery

Date	New Record	Old Record
Jun 27	111	108 in 2006
Jun 28	111	102 in 1987
Jul 11	114	110 in 2002

Potter Valley

Date	New Record	Old Record
Jun 1	104	104 in 1960
Jun 17	105	105 in 2012
Jun 18	105	101 in 2019
Jun 19	106	105 in 1945
Jul 9	108	106 in 1959
Jul 10	112	109 in 2002
Jul 11	112	107 in 1959
Jul 30	107	107 in 1977

Ukiah

Date	New Record	Old Record
Jun 18	109	108 in 2017
Jul 10	111	110 in 2002

Ranking of Average Daily Max Temp for June & July

Trinity River Hatchery

Rank	Year	Ave Max Temp
1	2021	99.3
2	2018	94.8
3	2003	93.5
4	2017	92.9
-	2002	92.9

Ukiah

Rank	Year	Ave Max Temp
1	2021	96.0
-	1960	96.0
3	1926	94.9
4	1918	93.7
5	1961	93.4

Potter Valley

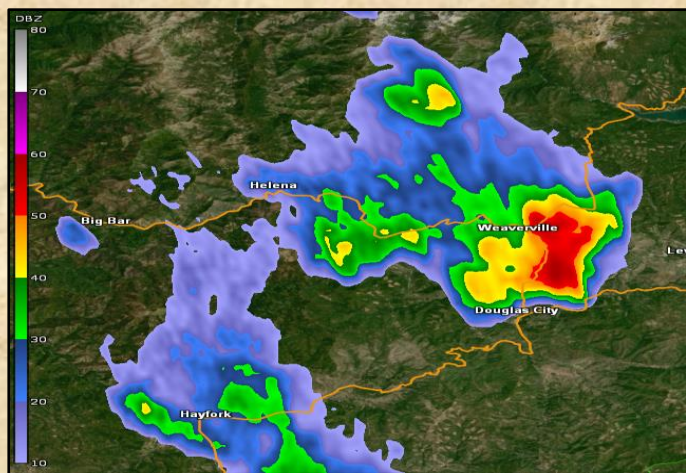
Rank	Year	Ave Max Temp
1	2021	97.7
-	2017	97.7
3	1960	97.6
4	2018	94.9
5	2015	94.4

Weaverville Downburst - July 30, 2021

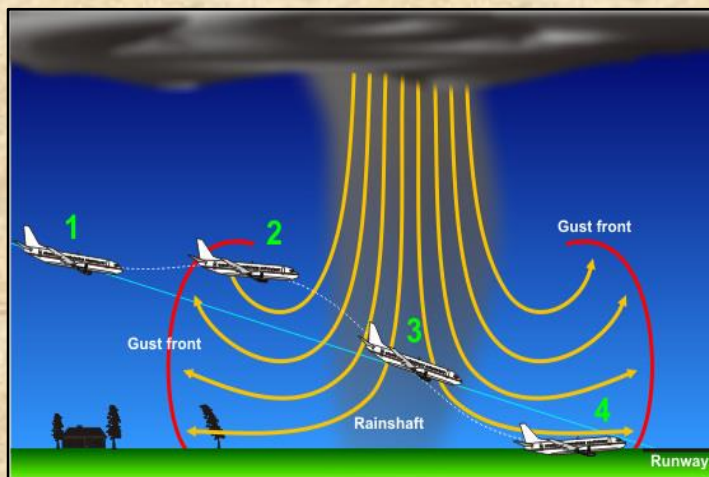
by Matthew Kidwell, Jonathan Garner, & Scott Carroll

On July 30th, 2021, a severe thunderstorm developed over Weaverville, bringing heavy rain, damaging winds, and dime sized hail. Reports were received of widespread downed trees resulting in power and travel disruptions. Wind gusts to 43 mph were recorded near the storm at the Five Cent RAWS weather station (1.3 miles northeast of Weaverville). The temperature there also dropped rapidly from 103°F to 67°F (36°F) in less than 2 hours, and rainfall totaled .87 inches. At the Weaverville Ranger Station, 1.01 inches of rain fell in less than 45 minutes. The hail also caused significant damage to the air conditioning units at the Trinity County Jail.

As a result of the cooling, the density of the air increases, causing it to sink toward the earth. When this dense, rained-cooled air reaches the surface, it spreads out horizontally, with the leading edge of the cool air forming a gust front. The gust front marks the boundary of a sharp temperature decrease and increase in wind speed. This is called a downburst. See idealized image below.



Radar image from 3:56 PM, July 30th

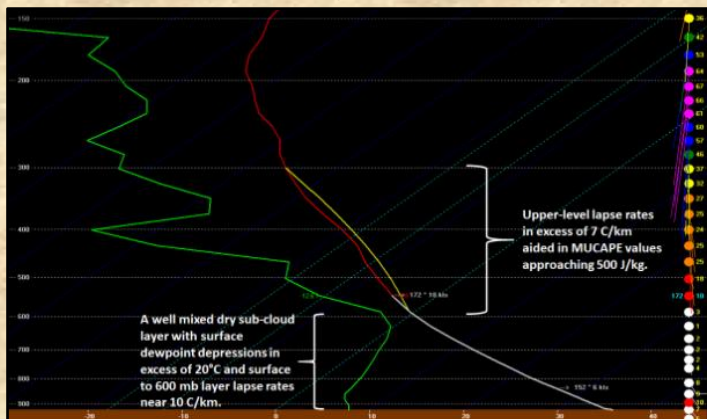


As air rises, it will cool to the point of condensation when water vapor forms tiny water droplets, comprising the cumulus cloud, the predecessor of the thunderstorm. Near the center of the updraft, the particles begin to coalesce, forming larger droplets. This continues until the rising air can no longer support the size of water drops.

Once the rain drops begin to fall, friction causes the rising air to begin to fall towards the surface itself. Additionally, some of the falling rain will evaporate. Through evaporation, heat energy is removed from the atmosphere, cooling the air associated with the precipitation. This is more pronounced where the lower atmosphere is drier, and this was the case for the Weaverville storm (see image below).



Tony Reed, The Trinity Journal



RAP model sounding for Weaverville for 4 PM, July 30th



Tony Reed, The Trinity Journal

For more information on microbursts, visit: https://www.weather.gov/jetstream/wind_damage

Summer Weather Summary

by Matthew Kidwell & James White

June

A high pressure ridge dominated for much of the month, bringing above normal high temperatures for most areas. The high temperature in Ukiah climbed over 100°F on 8 days, reaching 109°F on the 18th. There were a few breaks in the heat during the month as the marine air reached into Ukiah. Two weather systems did manage to break down the ridge and brought rain to the area, although it was mainly confined to the northern areas. Gasquet and Crescent City saw 150 to 200 percent of their normal rainfall for the month, while Lake and interior southern Mendocino counties saw little to no rainfall.

July

High pressure dominated for much of the month and brought above normal high temperatures for most of the interior. While few days were particularly extreme, the heat was remarkably consistent. Despite only setting one new high temperature record on July 10th, Ukiah saw an average monthly temperature of 79°F and average daily high over 100°F, making this the hottest month for the Ukiah area since records began in 1893! At the coast, July was the cloudiest month in Eureka since May 2019 and the cloudiest July since 2012. Drizzle and fog were common along the coast, though this didn't produce much in the way of measurable rain. Most of the coastal rainfall occurred early on July 27th with the formation of scattered thunderstorms. There were a few periods of monsoonal moisture spreading north across the interior, with one such surge during the last week of July leading to several days of thunderstorms across Trinity and eastern Del Norte counties. Several flash flood warnings were issued for burn scars in Del Norte County, and damaging wind and hail were reported in Weaverville on July 30th. While these storms produced welcome rainfall, critically dry fuel conditions still allowed lightning strikes to start several fires including the Monument and McFarland fires and the River Complex.

August

High pressure early in the month trapped smoke near the coast, leading to many red sunsets. Farther inland, smoke was a concern throughout the month with frequent periods of hazardous smoke conditions in Trinity County, especially when high pressure kept smoke trapped in valleys. Smoke helped keep temperatures closer to normal across Trinity, inland Humboldt, and inland Del Norte counties. Farther south in Mendocino and Lake counties, August was another very hot month for the interior with temperatures well above normal, capping off one of Ukiah's hottest summers ever. As is normal for August, little precipitation was observed except for some periods of drizzle along the coast.

Summer Climate & Fall Outlook

by Scott Carroll

Summer Record Events

Date	Location	Record	Value	Previous Record
Jun 9	Eureka	Mn Temp	43	44 in 2002
Jun 13	Crescent City	Rainfall	1.94	.63 in 1907
	Eureka	Rainfall	.73	.62 in 1992
Jun 18	Ukiah	Max Temp	109	108 in 2017
Jul 10			111	110 in 2002
Aug 15			109	107 in 1951

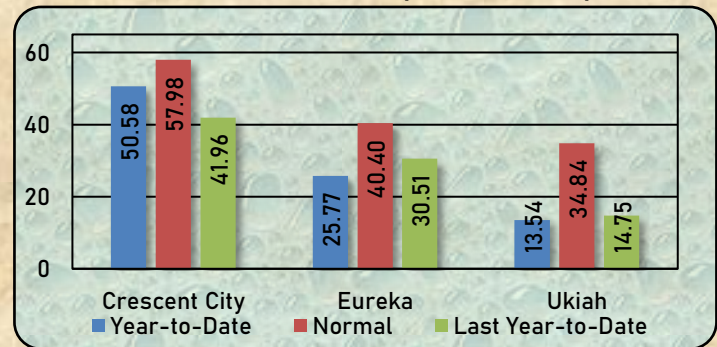
temperatures in °F, rainfall in inches

Summer 2021 Monthly Climate Comparison

	Crescent City			Eureka			Ukiah		
	Ave H	Ave Lo	Total Precip	Ave H	Ave Lo	Total Precip	Ave H	Ave Lo	Total Precip
Jun	61.7	51.0	3.00	63.0	50.9	1.06	91.4	55.4	Trace
Jul	62.1	53.2	.05	61.1	52.2	.21	100.5	58.0	None
Aug	62.5	51.5	None	63.4	51.7	.03	98.0	57.3	None

temperatures in °F, rainfall in inches

2020-21 Water Year Precipitation Comparison



rainfall in inches from Oct 1, 2020 through Sep 30, 2021

October-December Outlook

[click images for links](#)

The Climate Prediction Center's outlook for October through December for Northwest California is calling for slightly better chances for above normal temperatures (*figure 1 below*) and precipitation (*figure 2 below*). Most of the southern three quarters of the country is forecast to have above normal temperatures through the end of the year with equal chances of above and below normal temperatures across the Pacific Northwest, the northern Rockies, and the northern Plains. Wetter than normal conditions are predicted for the Pacific Northwest and parts of the Northeast, while drier than normal conditions are anticipated for much of the South extending into the Central Plains.

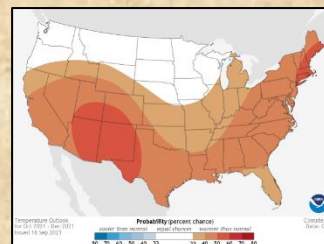


Figure 1 - Temperature Outlook

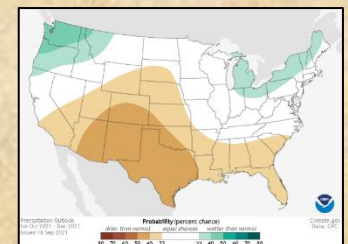


Figure 2 - Precipitation Outlook

Astronomy Corner

by Scott Carroll

On Thursday night, November 18th-19th, a partial lunar eclipse will be visible from northwest California. While this is a partial eclipse- meaning the moon will not be completely shadowed by Earth- Earth's shadow will cover approximately 97% of the moon's face at the time of maximum eclipse. The entire eclipse will occur before sunrise and civil twilight across northwest California... weather permitting, of course!

Partial Lunar Eclipse – November 18-19, 2021	
Penumbral eclipse begins	10:02pm
Partial eclipse begins	11:19pm
Maximum eclipse	1:03am
Partial eclipse ends	2:47am
Penumbral eclipse ends	4:04am
Civil twilight begins	6:38am
Sunrise	7:08am

Times are for Eureka, CA, but will be similar for our entire area.

Several meteor showers will occur through the end of the calendar year. The Orionids, Taurids, Leonids, Geminids, and Ursids are all coming up over the next few months. Meteor showers are named for the constellations that they appear to radiate from. However, meteors visible from Earth are comprised of material in orbit of our sun. The best times to view meteor showers are when the moon has either not risen or is close to new, ensuring a darker sky. The number of meteors typically increases a few days before the maximum date and then decreases for several days after the maximum. Typically, the Geminid meteor shower is one of the most prolific. Unfortunately, the Orionid and Leonid showers will occur around the time of full moons in mid-October and mid-November respectively.

Moon Phases					
	October		November		December
●	6 th	●	4 th	●	3 rd
☾	12 th	☾	11 th	☾	10 th
●	20 th	●	19 th	●	18 th
☾	28 th	☾	27 th	☾	26 th

Night Sky Calendar	
Date	Event
Oct 14	Moon-Saturn conjunction
Oct 15	Moon-Jupiter conjunction
Oct 21	Orionids meteor shower maximum
Nov 5	S Taurids meteor shower maximum
Nov 7	Moon-Venus conjunction
Nov 10	Moon-Saturn conjunction
Nov 11	Moon-Jupiter conjunction
Nov 12	N Taurids meteor shower maximum
Nov 17	Leonids meteor shower maximum
Nov 19	Partial lunar eclipse
Dec 6	Moon-Venus conjunction
Dec 7	Moon-Saturn conjunction
Dec 8	Moon-Jupiter conjunction
Dec 13	Geminids meteor shower maximum
Dec 22	Ursids meteor shower maximum
Dec 28	Mercury-Venus conjunction
Dec 31	Moon-Mars conjunction

Moon phases and event information courtesy of NASA

Rainy Season Preparation Checklist

- ✓ Clean and repair gutters around your house. *Watch out for insects and other small animals!*
- ✓ Sweep up debris from around storm drains near your house.
- ✓ Locate and repair any roof damage. Water damage inside your house can be indicative of roof damage outside. Moss on the edges of shingles can allow rain and wind to get beneath the shingles during inclement weather. *Be careful up there!*
- ✓ Trim any branches that may make contact with your house.
- ✓ Look for water accumulation around the foundation of your home, and direct it away by re-grading or using trenches.

We're always looking for amateur precipitation observers to join our team, and this is especially true as we move into the fall and winter months. A great way to participate is by joining CoCoRaHS (Community Collaborative Rain, Hail, and Snow Network).

For more information about the CoCoRaHS program, click [here!](#)



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