Welcome to the winter 2020-21 installment of The North Coast Observer! In this issue, there are articles on the set of new climatological normals coming out in 2021, a recap of the numerous fall temperature records that were tied or broken, and a summary of the November 9th cold snap. As always, a detailed summary of the previous season is included, along with an outlook for the coming spring. Also, make sure to check out our astronomy corner, with information about events such as the much-anticipated conjunction of Jupiter and Saturn late in December.

As Northwest California transitions into winter, the weather focus shifts to increasing rains and mountain snows. Stay tuned for the latest forecasts, watches, and warnings. If you haven’t already, make sure you follow us on social media (links below). Also be sure to check us out on Instagram! And, above all, make sure you have a safe winter!

Follow Us on Social Media!

<table>
<thead>
<tr>
<th>Website</th>
<th>weather.gov/eureka</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facebook</td>
<td>facebook.com/NWSEureka</td>
</tr>
<tr>
<td>Twitter</td>
<td>twitter.com/NWSEureka</td>
</tr>
<tr>
<td>New! Instagram</td>
<td>instagram.com/NWSEureka</td>
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Upcoming Events

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dec 1</td>
<td>Meteorological winter begins</td>
</tr>
<tr>
<td>Dec 21</td>
<td>Winter solstice at 2:02 AM</td>
</tr>
<tr>
<td>Feb 9</td>
<td>Birthday of the National Weather Service</td>
</tr>
<tr>
<td>Mar 1</td>
<td>Meteorological spring begins</td>
</tr>
<tr>
<td></td>
<td>Growing season begins (zones 101, 103, 109-115)</td>
</tr>
<tr>
<td>Mar 20</td>
<td>Spring equinox at 2:37 AM</td>
</tr>
<tr>
<td>Mar 23</td>
<td>World Meteorological Day</td>
</tr>
</tbody>
</table>

NWS Eureka is now on Instagram!

by Josh Whisnant

The Eureka National Weather Service forecast office has been chosen to participate in an agency-wide trial for the social media platform Instagram. The trial will run from now through June of 2021. As an office, we plan on using the platform for mostly the promotion of beach and weather safety, with some weather-related materials sprinkled in. Be sure to follow us on Instagram by searching for NWSEureka!
New Climatological Normals Coming Soon  
by Matthew Kidwell

When the National Weather Service talks about climate normal, they are referring to a three-decade average of climatological variables, including temperature and precipitation. NOAA’s National Center for Environmental Information (NCEI) is the agency that calculates these normals. Climate normals are computed every ten years. Currently, the NWS is using the year 1981 to 2010 normals. These will be recalculated in the spring of 2021 to add the most recent decade. The basic normals will come out in May and will include the daily temperature and precipitation. Additional parameters will be computed over the summer. Also, a small subset of stations with hourly observations will have hourly normals computed.

The normals are not just a simple average of the climate data for the 30-year period. They take into account any missing data and any small station moves. The normal are also subjected to an extensive quality control check which includes comparing the data with nearby stations to determine any large shifts in the data not seen in the other stations. It is important to be cautious in comparing the “new” normals with the previous version of the normals and considering it to be climate change. There may be changes in the calculations, instrumentaion, and more that may make it unrepresentative of how the climate is changing for a particular location. Rather than inferring climate change impacts from climate normals, we recommend users instead look at trends in the U.S. Historical Climatology Network (USHCN) time series.

For a station to have climatological normal, it must have a relatively complete dataset for the last 30 years. In some cases, stations with shorter periods of record can have what are called quasi-normals. These take into account data from other stations in the area and must have at least ten years of data. For more information visit: https://www.ncdc.noaa.gov/data-access/land-based-station-data/land-based-datasets/climate-normals

Numerous Fall Temperature Records Set
by Scott Carroll

Fall Record Events

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Record</th>
<th>Value</th>
<th>Previous Record</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sep 5</td>
<td>Ukiah</td>
<td>Max Temp</td>
<td>108</td>
<td>107 in 1904</td>
</tr>
<tr>
<td>Sep 6</td>
<td>Ukiah</td>
<td>Max Temp</td>
<td>113</td>
<td>108 in 1924</td>
</tr>
<tr>
<td>Sep 7</td>
<td>Eureka/Ukiah</td>
<td>Max Temp</td>
<td>76</td>
<td>111</td>
</tr>
<tr>
<td>Sep 28</td>
<td>Crescent City</td>
<td>Max Temp</td>
<td>95</td>
<td>87†</td>
</tr>
<tr>
<td>Sep 30</td>
<td>Ukiah</td>
<td>Max Temp</td>
<td>102*</td>
<td>102 in 1952</td>
</tr>
<tr>
<td>Oct 16</td>
<td>Ukiah</td>
<td>Max Temp</td>
<td>99</td>
<td>97 in 1961</td>
</tr>
<tr>
<td>Oct 17</td>
<td>Ukiah</td>
<td>Max Temp</td>
<td>100</td>
<td>97 in 1974</td>
</tr>
<tr>
<td>Oct 18</td>
<td>Ukiah</td>
<td>Max Temp</td>
<td>95*</td>
<td>95 in 1974</td>
</tr>
<tr>
<td>Oct 20</td>
<td>Ukiah</td>
<td>Max Temp</td>
<td>94*</td>
<td>94 in 1964</td>
</tr>
<tr>
<td>Oct 26</td>
<td>Eureka</td>
<td>Min Temp</td>
<td>35</td>
<td>38 in 2011</td>
</tr>
<tr>
<td>Nov 5</td>
<td>Ukiah</td>
<td>Max Temp</td>
<td>87</td>
<td>85 in 2019</td>
</tr>
<tr>
<td>Nov 9</td>
<td>Eureka</td>
<td>Min Temp</td>
<td>30</td>
<td>33 in 2018</td>
</tr>
<tr>
<td>Nov 20</td>
<td>Eureka</td>
<td>Min Temp</td>
<td>33*</td>
<td>33 in 2004</td>
</tr>
</tbody>
</table>

New November 9th Cold Snap
by Matthew Kidwell

On the morning of November 9th, 2020, temperatures dropped into the teens and 20s and across much of the area. Four of the six sites in our area that have long term records set a daily low temperature record. For some locations, these were the coldest temperatures since the winter of 2017. This was the result of a cold and very dry airmass moving over the region. Typically, in these situations, the valleys see fog or low clouds which keep temperatures from dropping this low. In this case, it had been several days since any rainfall had occurred, and, as a result, little fog or low cloudiness formed during the night.

Minimum Temperatures – November 9, 2020

<table>
<thead>
<tr>
<th>Station</th>
<th>Low Temp</th>
<th>Previous Record</th>
<th>Coldest Since</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hayfork RAWS</td>
<td>12</td>
<td>1/6/2017 (11)</td>
<td></td>
</tr>
<tr>
<td>Ruth RAWS</td>
<td>18</td>
<td>10/30/2019 (18)</td>
<td></td>
</tr>
<tr>
<td>Soda Creek RAWS</td>
<td>18</td>
<td>2/23/2018 (18)</td>
<td></td>
</tr>
<tr>
<td>Willits CWOP</td>
<td>19</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Eel River RAWS near Covelo</td>
<td>20</td>
<td>2/27/2018 (20)</td>
<td></td>
</tr>
<tr>
<td>Big Bar RAWS</td>
<td>22</td>
<td>1/2/2016 (22)</td>
<td></td>
</tr>
<tr>
<td>Laytonville RAWS</td>
<td>23</td>
<td>1/6/2017 (23)</td>
<td></td>
</tr>
<tr>
<td>Potter Valley Powerhouse</td>
<td>23 (26)</td>
<td>11/29/2019 (23)</td>
<td></td>
</tr>
<tr>
<td>Big Valley near Kelseyville</td>
<td>24</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Eel River Camp near Redway</td>
<td>26</td>
<td>10/30/2019 (26)</td>
<td></td>
</tr>
<tr>
<td>Ukiah Municipal AP</td>
<td>26 (25)</td>
<td>1/1/2019 (26)</td>
<td></td>
</tr>
<tr>
<td>Hoopa RAWS</td>
<td>27</td>
<td>11/30/2015 (27)</td>
<td></td>
</tr>
<tr>
<td>Alder Point RAWS</td>
<td>28</td>
<td>2/4/2020 (27)</td>
<td></td>
</tr>
<tr>
<td>Boonville RAWS</td>
<td>28</td>
<td>2/4/2020 (27)</td>
<td></td>
</tr>
<tr>
<td>Fortuna (Rohnerville AP)</td>
<td>28</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>McKinleyville (Arcata-Eureka)</td>
<td>28</td>
<td>2/22/2020 (28)</td>
<td></td>
</tr>
<tr>
<td>Woodley Island (NWS Eureka)</td>
<td>30 (33)</td>
<td>2/4/2020 (29)</td>
<td></td>
</tr>
<tr>
<td>Fort Bragg 5 N</td>
<td>31</td>
<td>11/30/2019 (30)</td>
<td></td>
</tr>
<tr>
<td>Scotia</td>
<td>31</td>
<td>2/4/2020 (30)</td>
<td></td>
</tr>
<tr>
<td>Crescent City (McNamara AP)</td>
<td>36 (32)</td>
<td>4/1/2020 (36)</td>
<td></td>
</tr>
</tbody>
</table>

Traveling across the mountains this season?
Make sure to check out our mountain pass forecast page before you leave at weather.gov/eka/mountainPassForecast
**Winter Weather Safety**

**CLICK IMAGES TO ENLARGE**

**Sneaky** Winter Hazards

The winter season brings many weather events that can "sneak" up on you. These are weather hazards that cause big impacts and make travel difficult without making big news.

**Safety Tips**

- Slow down
- Use your low-beam headlights
- Leave plenty of distance between you and other vehicles

**Winter Driving While You Know**

- Check road conditions: GLASS in your view? It’s likely you should refrain from driving or adapt your driving to the road conditions.
- Pack an emergency supply kit: Check your vehicle with a road-to-phone charger, tools, snacks, flashlight, and water. Make sure you have a red triangle for your vehicle.
- Ready your vehicle: Check your battery, ensure it’s plugged in, and check your tires.

**Don’t Let Black Ice Sneak Up On You**

- Can form on any road, but also along curbs and drainage areas due to melting snow.
- More prevalent at night, but can still be around in the morning.
- Don’t drive during freezing temperatures after rain or snow melt.

**Winter Precipitation**

- Snow: Snowfall accumulates on the surface.
- Sleet: Precipitation falls as ice pellets and then melts to rain.
- Freezing Rain: Precipitation falls as rain and freezes on contact with surfaces.
- Rain: Precipitation falls as rain and does not accumulate on surfaces.

**After a Wildfire**

Flash floods and debris flows happen quickly with minutes of rainfall. Prepare now!

- Be aware of your surroundings and any instructions from local officials.
- If you notice a wildfire or debris flow, get to the highest point in your home. Do not enter water.

**Winter Info Graphics**

**SNOW: RATIO**

The percentage of water within a sample of snow is called "snow ratio." An old rule of thumb was that for every 10 inches of snow, there would be 1 inch of water (10:1).

- Variables that affect snow ratio
  - Depth of the "warm" layer from the surface into the snow-producing cloud.
  - Amount of ice in the snow-producing cloud.
  - If it’s windy, snowflakes can fragment, losing their "lacy" structure.
- Deep cold leads to higher snow ratios.

**Measuring Snow**

- Six Basic Steps for Properly Measuring Snow:
  1. Supplier: Select the appropriate type of snow gauge.
  2. Planning: Map the location of your snow gauge.
  3. Setup: Level the snow gauge at least 1 foot above the ground.
  4. Measuring Snow: Use a ruler to measure the depth of snow.
  5. When to Stop: Stop measuring once the snow stops falling.
  6. Reporting: Record the snow depth and any weather observations.
**Fall Weather Summary**

**SEPTEMBER**

The weather pattern in northwest California was dominated by a ridge of high pressure aloft. This kept temperatures above normal for much of the month. In particular, periods of moderate to strong offshore flow helped to warm the coast. On the 28th, a combination of strong high pressure, warm air aloft, and offshore flow brought record-setting high temperatures to the coast. Eureka set a daily record high and tied the all-time record high of 87°F. Only a few weak frontal boundaries were able to break down the ridge. Therefore, rainfall amounts were generally below normal across the area except for Eureka, where slightly above normal rainfall was recorded. Much of the month saw smoky conditions and poor air quality due to the wildfires. Temperatures were kept below normal in some of the inland areas due to the heavy smoke.

**OCTOBER**

High pressure dominated the weather for the month of October on the west coast. One weather system moved through the area on the 10th, bringing about the only significant rain of the month to most of the area. Del Norte County got the closest to normal on rainfall with nearly 30 percent of normal, while areas farther south saw only zero to 20 percent of normal. High temperatures across the inland areas ended the month well above normal. Ukiah set or tied four high temperature records around the middle of the month. Temperatures closer to the coast ended up near normal due to a persistent marine layer. Interior low temperatures were close to normal due to some clear and dry nights. The coast saw some chilly nights as well during a stretch of clear days late in the month, with Eureka setting a low temperature record on the morning of the 26th with 35°F.

**NOVEMBER**

Unseasonably warm and dry weather early in November, particularly across interior northwest California, ended abruptly on the 6th as a strong cold front swept through. Rainfall amounts were not especially heavy, with minimal amounts across much of Mendocino and Lake counties. Dry air in the wake of the front brought clear skies and freezing temperatures to the region. Interior areas saw temperatures in the teens and 20s, while coastal areas saw temperatures drop to near freezing. Several stronger and wetter weather systems brought the first substantial rainfall of the season around the middle of the month. Another period of dry, clear, and chilly weather followed and continued for much of the remainder of the month with only a few weaker fronts and lighter rainfall. Most areas ended the month with 30 to 50 percent of normal rainfall. The clear skies and dry conditions allowed for high temperatures to be near or slightly above normal, with most areas seeing low temperatures below normal.

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**Fall Climate & Winter Outlook**

**Fall 2020 Monthly Climate Comparison**

<table>
<thead>
<tr>
<th></th>
<th>Crescent City</th>
<th>Eureka</th>
<th>Ukiah</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ave Hi</td>
<td>89.66</td>
<td>54.42</td>
<td>90.28</td>
</tr>
<tr>
<td>Ave Lo</td>
<td>57.03</td>
<td>31.62</td>
<td>50.38</td>
</tr>
<tr>
<td>Total Precip</td>
<td>32.73</td>
<td>22.59</td>
<td>8.43</td>
</tr>
<tr>
<td>Ave Hi</td>
<td>32.73</td>
<td>34.02</td>
<td>31.08</td>
</tr>
<tr>
<td>Ave Lo</td>
<td>22.59</td>
<td>37.08</td>
<td>28.38</td>
</tr>
<tr>
<td>Total Precip</td>
<td>10.14</td>
<td>6.94</td>
<td>3.70</td>
</tr>
</tbody>
</table>

**Calendar Year-to-Date Precipitation Comparison**

- **Figure 1** – Temperature Outlook
- **Figure 2** – Precipitation Outlook

**Winter Outlook (December-February)**

The Climate Prediction Center’s winter outlook for northwest California is calling for nearly even chances of above or below normal temperatures (figure 1 below), although there is a slightly better than even chances of above normal temperatures across the southern portion of our area. There are also nearly even chances of above and below normal precipitation (figure 2 below), with a slightly better than even chance of below normal precipitation across the extreme southern portion of the area.

Nation-wide, there are better than even chances of cooler and wetter conditions across the northern tier of states, while better than even chances of warmer and drier conditions are anticipated across the south.

More detailed outlook information can be found on the Climate Prediction Center’s [website](https://www.cpc.ncep.noaa.gov). For more detailed local climate information, visit NWS Eureka’s [homepage](https://www.nws.noaa.gov/), then click on the Climate and Past Weather menu.
Jupiter and Saturn have been getting closer and closer in the night sky for months, and this will come to a culmination on the night of December 21-22, when the planets reach their closest apparent distance. In fact, the two planets will appear within the field of view of a pair of binoculars or a telescope, along with several of Jupiter’s moons. If it is going to be cloudy that night, be sure to get outside in the days prior or following, as the planets will still appear relatively close.

Several meteor showers reach their peak in the winter. The Geminid shower peaks around December 13th. This is right around the time of the new moon, providing dark skies and ideal viewing conditions (as long as there are clear skies). The Ursid meteor shower will peak around December 22nd. This is around the time of the first quarter moon. However, the moon will be setting around midnight, leaving the optimal time for meteor view (after midnight) moon-free. The Quadrantid meteor shower peaks around January 3rd, which is between the dates of the full moon and last quarter moon. This will make viewing a bit more of a challenge. Meteor showers are named for the constellations (or former constellations) that they appear to radiate from. While the dates indicated are the typical maxima, the number of meteors typically increases a few days before the maximum date, then decreases for several days after the maximum. Once again, if clouds are in the forecast, try within a few days either side of the maximum. Click for information about the Geminid, Ursid, and Quadrantid meteor showers.

### Moon Phases

<table>
<thead>
<tr>
<th>Month</th>
<th>7th</th>
<th>6th</th>
<th>4th</th>
<th>5th</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dec</td>
<td>14th</td>
<td></td>
<td>11th</td>
<td>13th</td>
</tr>
<tr>
<td>Jan</td>
<td>21st</td>
<td>20th</td>
<td>19th</td>
<td>21st</td>
</tr>
<tr>
<td>Feb</td>
<td>28th</td>
<td></td>
<td>27th</td>
<td>28th</td>
</tr>
</tbody>
</table>

### Night Sky Calendar

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dec 12</td>
<td>Moon-Venus conjunction</td>
</tr>
<tr>
<td>Dec 13</td>
<td>Geminid meteor shower maximum</td>
</tr>
<tr>
<td>Dec 16</td>
<td>Moon-Jupiter-Saturn conjunction</td>
</tr>
<tr>
<td>Dec 22</td>
<td>Jupiter-Saturn conjunction</td>
</tr>
<tr>
<td>Jan 3</td>
<td>Quadrantid meteor shower maximum</td>
</tr>
<tr>
<td>Jan 11</td>
<td>Moon-Venus conjunction</td>
</tr>
<tr>
<td>Feb 8</td>
<td>Mercury inferior conjunction</td>
</tr>
<tr>
<td>Feb 18</td>
<td>Moon-Mars conjunction</td>
</tr>
<tr>
<td>Feb 22</td>
<td>Mercury-Saturn conjunction</td>
</tr>
<tr>
<td>Mar 4</td>
<td>Mercury-Jupiter conjunction</td>
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<tr>
<td>Mar 9</td>
<td>Moon-Saturn conjunction</td>
</tr>
<tr>
<td>Mar 10</td>
<td>Moon-Jupiter-Mercury conjunction</td>
</tr>
<tr>
<td>Mar 19</td>
<td>Moon-Mars conjunction</td>
</tr>
</tbody>
</table>

Moon phases and event information courtesy of NASA

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This fall, NWS Eureka partnered up with multiple emergency response agencies across northwest California to discuss flood preparedness at several preseason flood coordination meetings that were held virtually. This was an opportunity for various agencies that may not often collaborate on a routine basis to come together to share crucial flood information like resource allocations, disaster declarations, and other critical details involving emergency response. A common theme that arose this year was debris flow threats on fresh burn scars, particularly in the upper reaches of the Mad River drainage south of Ruth. This area was heavily burned by the August Fire Complex and will have an enhanced risk of flooding this winter. NWS Hydrologist Kathleen Zontos and Warning Coordination Meteorologist Ryan Aylward provided a winter weather forecast to help give these partners some guidance on how to best prepare for the winter ahead. These discussions help our community become weather-ready for the next big storm event that comes our way.

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