The North Coast Observer
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From all of us here at the National Weather Service in Eureka, we hope you and your family have a happy and safe holiday season and a great 2019!

NWS Eureka Hosts Second Open House in 2 Years

by Scott Carroll

On September 29th, 2018, the National Weather Service in Eureka, CA hosted another open house for the public. This was the second year in a row that NWS Eureka has held an open house! Technician **Tony Ashford** gave tours of our operations area, and Senior Forecaster **Matthew Kidwell** gave periodic presentations on the importance of webcams, **SKYWARN** spotter, and **CoCoRaHS** precipitation observations. Several of our area partners participated in the event by manning informative booths outside. These partners included the Redwood Coast Tsunami Work Group, CalOES Coastal Region, Humboldt County OES, the Community Emergency Response Team (CERT), 211 Humboldt, and Redwood News. Thanks to all of our partners and to everyone who attended! We look forward to hosting future open house events to continue working toward a Weather Ready Northwest California.

Upcoming Winter Events	
Date	**Event**
Dec 1	Meteorological winter begins SKYWARN Recognition Day
Dec 21	Astronomical winter begins at 2:22pm
Feb 9	Birthday of the National Weather Service
Mar 1	Meteorological spring begins Growing season begins (zones 101, 103, & 109-113)

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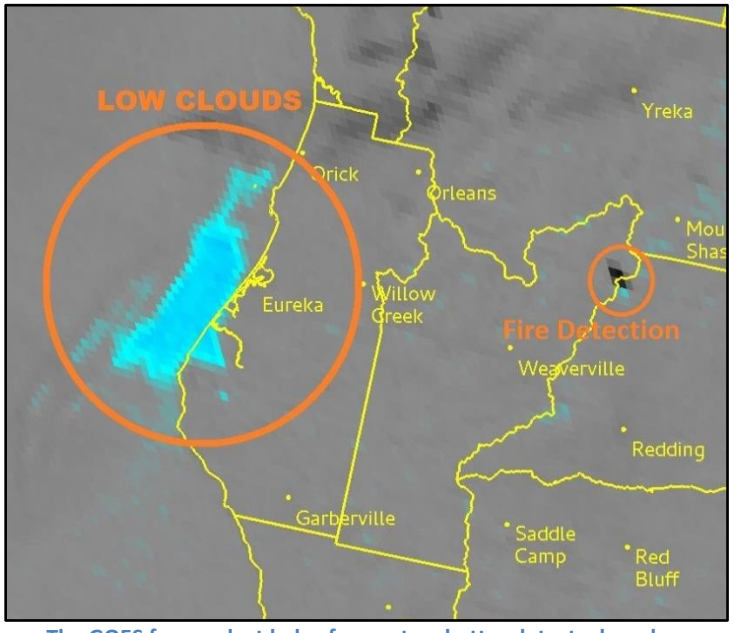
GOES-17 to Become GOES-West in January 2019

by William Iwasko

As many of you remember from the Fall Newsletter, the second in the series of new **geostationary operational environmental satellites** (GOES) was successfully launched on March 1st, 2018. As the on-orbit checkout procedures advanced, an issue with the onboard cooling system was uncovered which degrades 13 of the 16 channels from properly observing during the satellite's warm period. Despite this degradation in data quality, the satellite performs better than GOES-15 (the current GOES-West satellite) both with respect to the number of channels and temporal resolution of that data.

GOES-17 began drifting from its on-orbit checkout location at 89.5°W on October 24, 2018. It came to its final operational location of 137.2°W on November 13, 2018 and began a three week testing phase. Once this testing phase concludes, GOES-17 will become GOES-West (now scheduled for January 2019). GOES-15 will continue to operate in a modified position (128°W) until at least May 2019 when a decision will be made if GOES-15 can be placed into storage. NWS forecast offices in Alaska, Hawaii, Guam, and along the U.S. West Coast are extremely excited to utilize this new satellite as regular 5 minute updates and much finer resolution will now be possible. One of the products our office is most looking forward to is the **enhanced nighttime microphysics product**, which will help us better locate where fog and coastal stratus is located. This satellite will also greatly improve our ability to detect area wildfires and smoke plumes that may have gone undetected with the old satellite.

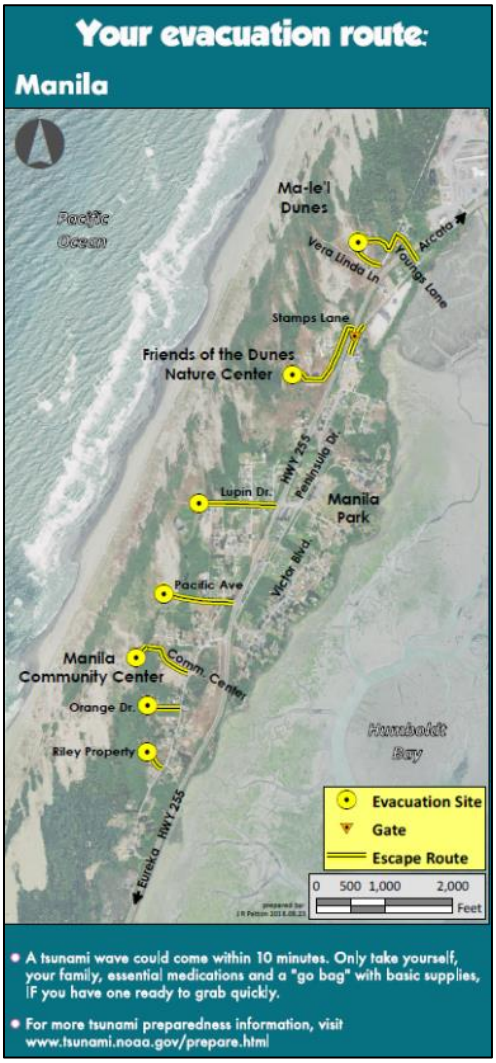


The GOES fog product helps forecasters better detect where low clouds are developing and how far inland they extend. This product can also highlight large wildfires that develop. In this case, the Delta Fire is circled.

Community of Manila Now Tsunami Ready

by Ryan Aylward

We would like to congratulate the community of Manila for becoming Tsunami Ready! This multi-year effort required, Manila to establish evacuation routes, evacuation sites, and effective means of communicating a threat to the community in the event of a local or distant source tsunami. Manila completed the required steps to becoming tsunami ready leading up to a capstone event: the Tsunami Preparedness and Health Fair held in September at the Manila Community Center. The Samoa Peninsula Community Collaborative distributed tsunami information, evacuation maps, and magnets to every household on the Samoa Peninsula to advertise for the event. Then, on Saturday September 22nd, **Troy Nicolini** (NWS Eureka Meteorologist-in-Charge) and **Lori Dengler** (Humboldt State University professor emeritus) gave a presentation on how to be Tsunami Ready in Northwest California and Manila specifically. There was great attendance and participation by community members and many organizations. ***Congratulations Manila!***



Climate Page
by Matthew Kidwell & Scott Carroll

Fall Weather Summary

September

A mix of upper level ridges and troughs brought a roller coaster of temperatures to the inland areas through the month. However, the overall temperatures were within a couple degrees of the seasonal normal. Late in the month along the coast, several days of very dense fog were reported. The upper level troughs remained dry until the last few days of the month when some light rain fell across much of the area. Despite this, rainfall amounts remained well below normal for the month.

October

A high pressure ridge over the west coast brought below normal rainfall and above normal inland temperatures. A few systems made it through the ridge and brought periods of light rain. At the coast, the temperatures were close to normal with some days of thick fog lingering through the day. This kept high temperatures in the lower 50s for a couple of days.

November

This month was a tale of two extremes. The first half of the month saw warm afternoons and chilly nights with high pressure in place over the area. Most areas were completely dry for this period. High temperatures across the area were above normal during this period, especially across the interior. This was in contrast to the low temperatures which were well below normal during this time frame. Ukiah and Eureka both set low temperature records. The rains returned on the 21st of the month. Significant rainfall fell through the end of the month across the area as a series of weather systems moved through. This rainfall didn't quite bring the monthly totals up to normal, but, many areas came close. These weather systems kept both high and low temperatures much closer to normal for the final week of the month.

Fall Record Events

Date	Location	Record	Value	Previous Record
Oct 14	Crescent City	Max Temp	79	77 in 2004
Oct 15	Eureka	Min Temp	38	39 in 1930
Nov 9	Eureka	Min Temp	33	36 in 1982
Nov 11	Ukiah	Min Temp	23	25 jin 1978

Climate Page *(continued)*
by Matthew Kidwell & Scott Carroll

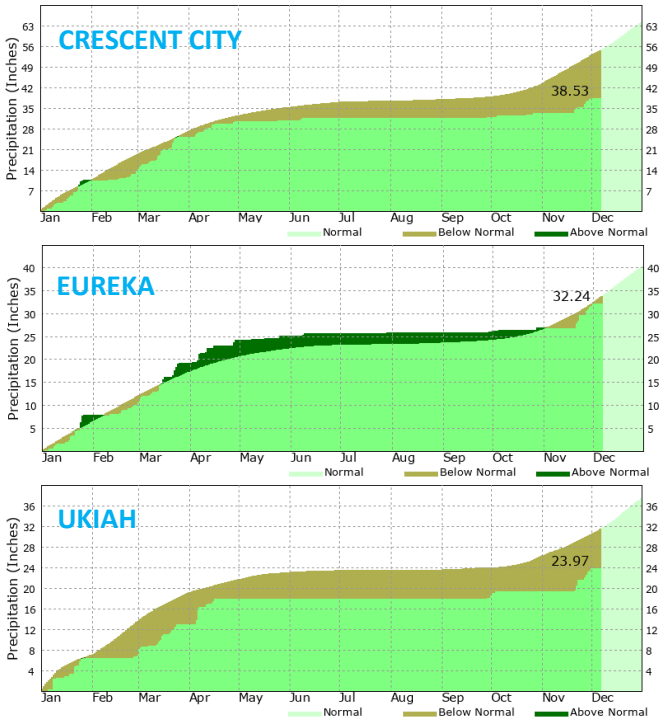
Fall 2018 Monthly Climate Comparison

	Crescent City			Eureka			Ukiah		
	Ave Hi	Ave Lo	Total Rain	Ave Hi	Ave Lo	Total Rain	Ave Hi	Ave Lo	Total Rain
Sep	62.0	47.4	0.20	63.4	49.9	0.19	88.3	49.8	0.03
Oct	61.8	47.7	1.58	61.1	46.8	0.85	79.5	45.7	1.33
Nov	59.2	44.0	4.57	59.1	42.1	4.94	66.8	37.6	4.01

temperatures in °F, rainfall in inches

Calendar Year-to-Date Precipitation Comparison

click images for links



data through December 5th

Winter Outlook (December-February)

click images for links

The Climate Prediction Center's winter outlook for NW California is calling for better than even chances of above normal temperatures *(figure 1 below)* with slightly better than even chances of above normal precipitation *(figure 2 below)*.

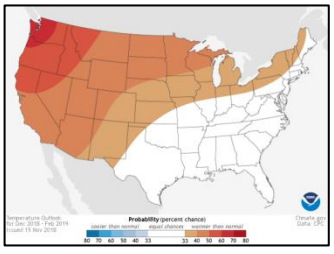


Figure 1 – Temperature Outlook

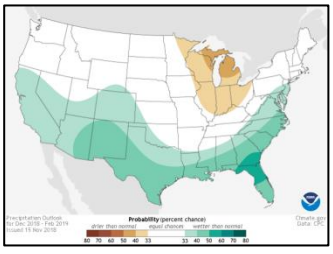
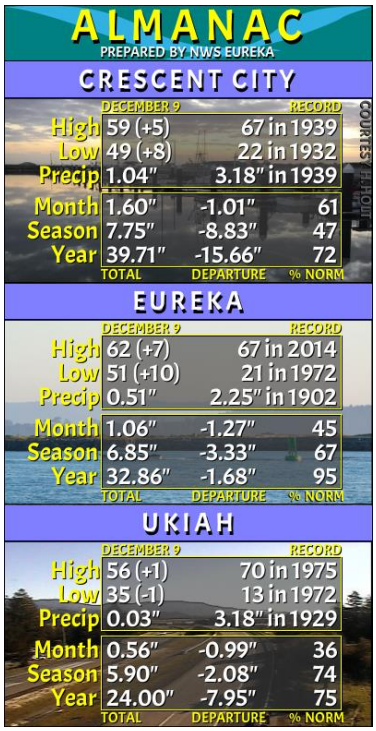


Figure 2 – Precipitation Outlook

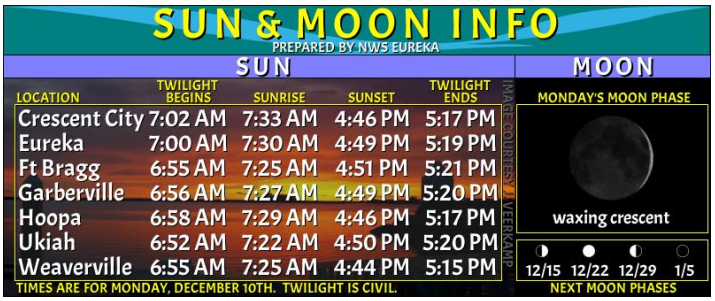
Better Know a Product: Social Media Graphics

by Scott Carroll

Occasionally, NWS Eureka will post almanac and sun/moon graphics to Twitter and/or Facebook. The **almanac graphic** *(right)* contains daily climatological statistics for the 3 main climate sites in our area- Crescent City, Eureka, and Ukiah. This information is always included in the daily Climate Report products issued by our office, but the graphics allow for incorporation into our social media presence online. High and low temperatures are listed, along with the departure from normal for each value. In addition, the record high and low temperatures are given. Daily rainfall and the record daily rainfall for the date are then included. Finally, a tally of the rainfall totals for the month, season, and calendar year are displayed, including their departures from normal and percentages of normal.



The **sun and moon info graphic** *(below)* lists sunrise and sunset times, along with twilight beginning and ending times, for several cities in northwest California. In addition, the current moon phase, along with the next four moon phases, are indicated.

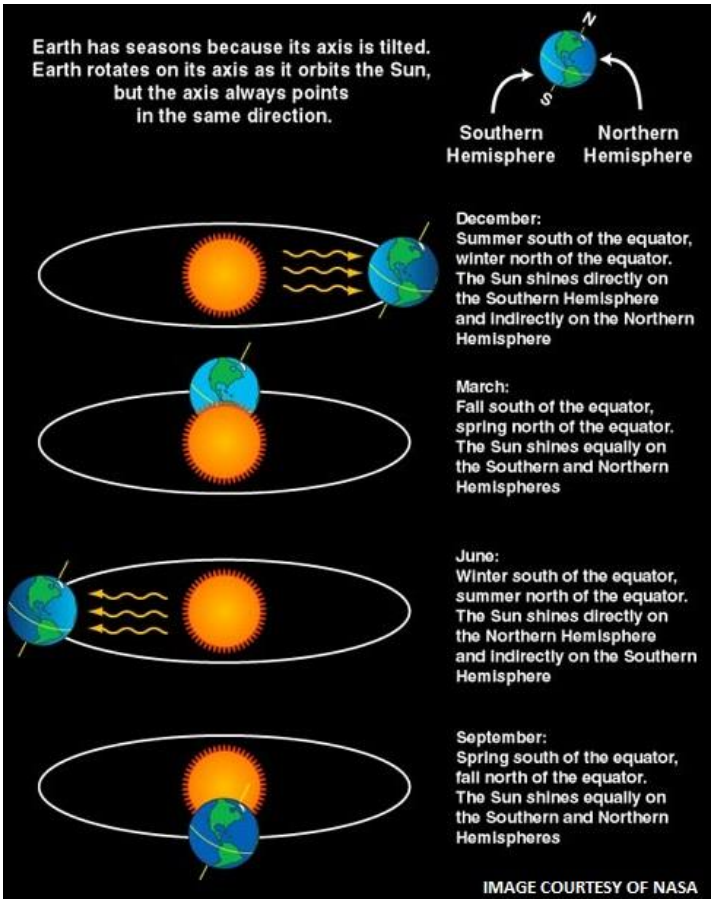


Follow us on Facebook at facebook.com/nwseureka and on Twitter at (twitter.com/nwseureka). In addition to these graphics, we frequently post graphical weather stories and photos. Time permitting, we'll also answer your weather-related questions!

The Importance of Earth's Tilt

by Scott Carroll

Both the **northern solstice** (also known as the **winter solstice** north of the equator) and **perihelion** occur during the northern hemisphere winter. The northern solstice is when the north pole reaches its maximum tilt away from the pole and the Sun's path in the sky reaches its farthest point south in relation to the equator (directly over the **Tropic of Capricorn**). Perihelion is the point at which the Earth is at the closest point to the Sun in Earth's orbit. This is about 91,402,500 miles (147,098,070 kilometers) or about 3.3% closer than when Earth is at its farthest point from the sun (**aphelion**). The fact that perihelion occurs during the middle of winter in the northern hemisphere points to the importance of Earth's tilt to seasonal changes in temperature!



Did You Know?

The tilt of Earth's axis is 23 ½ degrees relative to the orbital plane. This tilt is responsible for the changes in seasons.

Astronomy Corner
by Scott Carroll

Quite a few astronomical events take place during the winter months this year. Several meteor showers reach their maxima during this time every year, including the Geminids, Ursids, and Quadrantids. In addition, a total lunar eclipse will occur on January 20th of 2019. This eclipse will be visible in its entirety across northwest California (unless Mother Nature doesn't cooperate). Make sure to check the forecast before heading out at weather.gov/eureka, and bundle up!

Total Lunar Eclipse – January 20, 2019	
Penumbral eclipse begins	6:36 PM
Partial eclipse begins	7:33 PM
Total eclipse begins	8:41 PM
Maximum eclipse	9:12 PM
Total eclipse ends	9:43 PM
Partial eclipse ends	10:50 PM
Penumbral eclipse ends	11:48 PM
Penumbral duration	5h 12m
Umbral duration	3h 17m
Totality duration	1h 2m

Winter Moon Phases					
December		January		February	
●	6th	●	5th	●	4th
☽	15th	☽	13th	☽	12th
○	22nd	○	20th	○	19th
☾	29th	☾	27th	☾	26th

Winter Night Sky Calendar	
Date	**Event**
Dec 3	Moon-Venus conjunction
Dec 8	Moon-Saturn conjunction
Dec 14	Geminid meteor shower maximum
	Moon-Mars conjunction
Dec 21	Mercury-Jupiter conjunction
	Winter solstice at 2:22 PM
Dec 22	Ursid meteor shower maximum
Jan 1	Moon-Venus conjunction
Jan 2	Moon-Jupiter conjunction
Jan 3	Perihelion *(Earth closest to Sun)*
	Quadrantid meteor shower maximum
Jan 20	Total lunar eclipse *(totality at 9:12 PM)*
Jan 22	Venus-Jupiter conjunction
Jan 30	Moon-Jupiter conjunction
Jan 31	Moon-Venus conjunction
Feb 1	Moon-Saturn conjunction
Feb 18	Venus-Saturn conjunction
Feb 27	Moon-Jupiter conjunction

moon phase and event information courtesy of NASA

Bay Area Yellow Command Exercise
by William Iwasko

Our office participated in the **2018 Yellow Command Exercise** hosted in the Bay Area. This exercise provided emergency managers across the San Francisco Bay Area an opportunity to prepare, test, and improve their response capabilities in a no-fault learning environment. The scenario was a hypothetical earthquake event that occurred just outside of the San Francisco area which prompted the activation of 10 county and city Emergency Operations Centers (EOCs). The Monterey National Weather Service office participated by deploying most of their staff to area EOCs for onsite support. This required our office, as well as the forecast office in Oxnard, to provide forecast backup services for the Monterey area. In addition to forecasting for the Monterey Area from our office, we were able to deploy three staff members to the Bay area to participate in the event. Meteorologist **Karleisa Rogacheski** was deployed to the Napa County EOC, Meteorologist **Brad Charboneau** to the Marin County EOC, and Meteorologist **William Iwasko** visited the Alameda, Contra Costa, and city of Oakland EOCs. Fortunately, quiet weather allowed numerous agencies to participate in this exercise. Great strides were made in developing stronger relationships with area disaster responders.

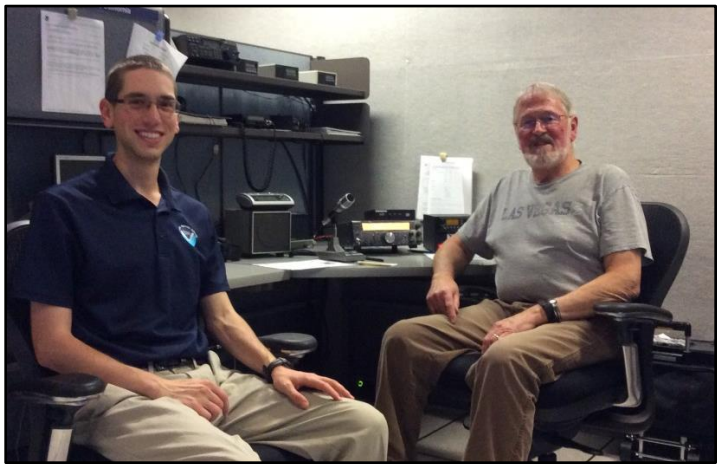
The NWS has an ongoing mission to strengthen relationships with area emergency managers and to showcase the abilities that we could provide to their disaster and recovery operations which many emergency partners may be unaware of. The exercise also provided the on-site meteorologists with a better understanding of what information is required by emergency managers and how we can improve our forecasts to better meet their needs in the future.

SKYWARN Recognition Day 2018

by William Iwasko

This year brought the 19th annual SKYWARN Recognition Day which was held November 30th through December 1st. SKYWARN recognition day recognizes the contributions that all amateur radio operators make to the mission of the NWS to protect life and property. Amateur radio operators comprise a large percentage of SKYWARN volunteers across the country who relay weather information from the field back to their local NWS office. Amateur radio operators also provide vital communication capabilities between NWS offices and local emergency management agencies when normal communications are compromised. During this special event, operators came to our office and attempted to make radio contact with other radio operators across the country and around the world.

This year, we had 3 local amateur radio operators stop by the office to participate from the **Humboldt Amateur Radio Club**. These operators spent 13 hours making radio contacts via the various amateur radio frequencies in addition to utilizing computer and other digital technology. They contacted 17 different NWS offices across the country, making contacts in 17 different states. We want to thank all of the operators who came by the office for their hard work and dedication in protecting life and property within our area. We look forward to working more closely with them in the future!



NWS Eureka meteorologist William Iwasko (left) and ham radio operator Don Campbell participating in Skywarn Recognition Day 2018.

NWS Participates in 2018 TREX

From Brad Charboneau

In early October, as yet another destructive and nearly unprecedented wildfire season neared its end in northwest California, a coalition of organizations sought to demonstrate how a "good" fire can be used as part of the solution to a seemingly worsening problem. Hosted in Orleans, California by the **Karuk Tribe**, **Mid Klamath Watershed Council**, the **Nature Conservancy**, and other partners, the fifth iteration of the **Klamath Prescribed Burning Training Exchange** (TREX) took place between October 2nd and 13th, bringing multiple organizations together with the common goal of learning effective techniques for applying prescribed fire. More importantly, the event aimed to illustrate the benefits of properly applied fire on the landscape and to teach others about the rich history of its use by indigenous peoples throughout the region.

Nearly 80 participants arrived from all over the country for this year's event, including several meteorologists from NWS Eureka. As recent events have clearly illustrated, weather plays an extremely critical role in the behavior of fire. As a result, information about upcoming weather conditions is crucial for planning prescribed fire activities, both for the purposes of achieving an efficient and beneficial burn and for keeping crews on the ground safe. For the first four days of the project, as many as four meteorologists from the National Weather Service provided on-site weather forecasting for the project, helping crews make critical decisions about when and where to burn.

While meteorologists from NWS Eureka have participated in past events, this was the first year in which a dedicated meteorologist remained on-site for multiple days. This provided a wonderful training experience for forecasters to learn about the benefits and history of prescribed burning in the region and to build relationships with local agencies involved. This knowledge will help us to better serve our fire partners in the future, and we look forward to growing this partnership and participating in future TREX events!

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