

#### Articles in this Edition:

Farewell Message 1

CoCoRaHS March Madness 2020 1

Water Spouts 101 2

Record Dry February for Much of NorCal 3

2020 Summer Climate Outlook 4

# California Cumulonimbus

Spring 2020

## Farewell Message

by Jimmy Taeger



A picture of me while hiking to the peak of Mt. San Geronio in 2019.

It is with great excitement to share that I'll be heading to Raleigh, NC, for a promotion to Lead Forecaster in April. Serving as a state and regional co-coordinator in California for CoCoRaHS has been an honor, and I hope you all enjoyed the newsletters that came out over the years.

Luckily, a meteorologist at the NWS San Diego office, Bruno Rodriguez, has volunteered to continue the biannual newsletter after my departure. If you have any questions about joining CoCoRaHS or ideas for the newsletter, feel free to email him at [Bruno.Rodriguez@noaa.gov](mailto:Bruno.Rodriguez@noaa.gov).

Thank you all so much for your reports and dedication to CoCoRaHS. They are of high value to many people, and I hope you know how much they are appreciated. Please continue to report daily, help recruit new observers, and never stop enjoying doing what you do for our network.

Thanks again!!



## CoCoRaHS March Madness 2020

by Stefanie Sullivan

It's that time of the year again – March Madness! The annual CoCoRaHS recruiting contest runs every year from March 1<sup>st</sup> to March 31<sup>st</sup>, and each state competes to see who can recruit the most new volunteer observers. There are two categories in the contest – the Traditional Count, which is for the greatest number of new observers in the state, and the Per Capita Count, which is for the greatest number of new observers per one million people in the state's population. The prize is the coveted CoCoRaHS Cup – a trophy the winning states get to keep and display for the year.

California, being the big, beautiful, and climatically diverse state that it is, needs more observers. This is especially true in rural areas where we may have little or no observers! Observation sites don't have to be limited to your backyard. Schools,

gardens, nurseries, residential communities, or even your own office could participate. Talk to your friends, family, co-workers, and neighbors about joining! Overhear someone at the water cooler

talking about the rain (or lack thereof)? Talk to them about CoCoRaHS. Who wouldn't want to know how much rain fell at their house? Remember – all you need to participate is a four inch rain gauge and the internet! Not only will you be able to earn bragging rights amongst friends when you get most rain out of a storm, you'll be helping with weather and climate research and operations by providing your valuable data. Let's join recruiting forces and lead CA to a CoCoRaHS cup victory!



CoCoRaHS National Director, Nolan Doesken, holding the CoCoRaHS Cup. (Source: CoCoRaHS)

## Waterspouts 101

by Casey Oswant

A waterspout is defined as a whirling column of air and mist. Waterspouts can occur over any body of water and are considered a marine weather hazard due to their potential to be as strong and destructive as a tornado. There are two categories of waterspouts: tornadic waterspouts and fair weather waterspouts. Tornadic waterspouts are tornadoes that form over water or tornadoes that start out on land and move onto the water. Tornadic waterspouts form in environments capable of producing severe weather and can often occur with other weather hazards such as thunderstorms, high seas, hail, and frequent lightning. Tornadic waterspouts form from the top down, descending from cumulus clouds to the surface of the water. Fair weather waterspouts form in the opposite direction, from the water up. As their name suggests, they form in fair weather conditions. These waterspouts are not viewed as dangerous because they form in conditions with light winds and therefore are stationary or move very little.

In order for waterspouts to form, there needs to be high levels of humidity and relatively high water temperatures compared to the surrounding air. The life cycle of a waterspout can be explained in five stages:

1. A dark spot forms over the water where the vortex is touching the water's surface,
2. Light and dark bands spiral out from the dark spot,
3. A swirling ring of sea spray forms around the dark spot,
4. A hollow funnel surrounded by water vapor becomes visible, signaling that the waterspout is at its most mature stage,
5. The waterspout will begin to decay and eventually collapse when warm air begins to flow into the vortex.

Like any other weather hazard, the National Weather Service has special warnings to inform mariners and the public when a waterspout is expected or has formed. When waterspouts develop, a Marine Weather Statement is issued. If a waterspout moves from the water onto land, a Tornado Warning is issued.

Some waterspout safety tips:

- Listen for special marine warnings about waterspout sightings that are broadcast on NOAA Weather Radio.
- Watch the sky for certain types of clouds. In the summer, with light winds, look for a possible waterspout underneath a line of cumulus clouds with dark, flat bases. Anytime of the year, a thunderstorm or line of thunderstorms, can produce very intense waterspouts.
- If a waterspout is sighted, immediately head at a 90 degree angle from the apparent motion of the waterspout.
- Never try to navigate through a waterspout. Although waterspouts are usually weaker than tornadoes, they can still produce significant damage to you and your boat.

Sources:

Weather.gov: <https://www.weather.gov/mfl/waterspouts>

National Geographic: <https://www.nationalgeographic.org/encyclopedia/waterspout/>

NOAA National Ocean Service: <https://oceanservice.noaa.gov/facts/waterspout.html>



FIGURE 1) Multiple waterspouts from a storm. (Source: NOAA)



## California Cumulonimbus

## Record Dry February for Much of NorCal

by Bruno Rodriguez

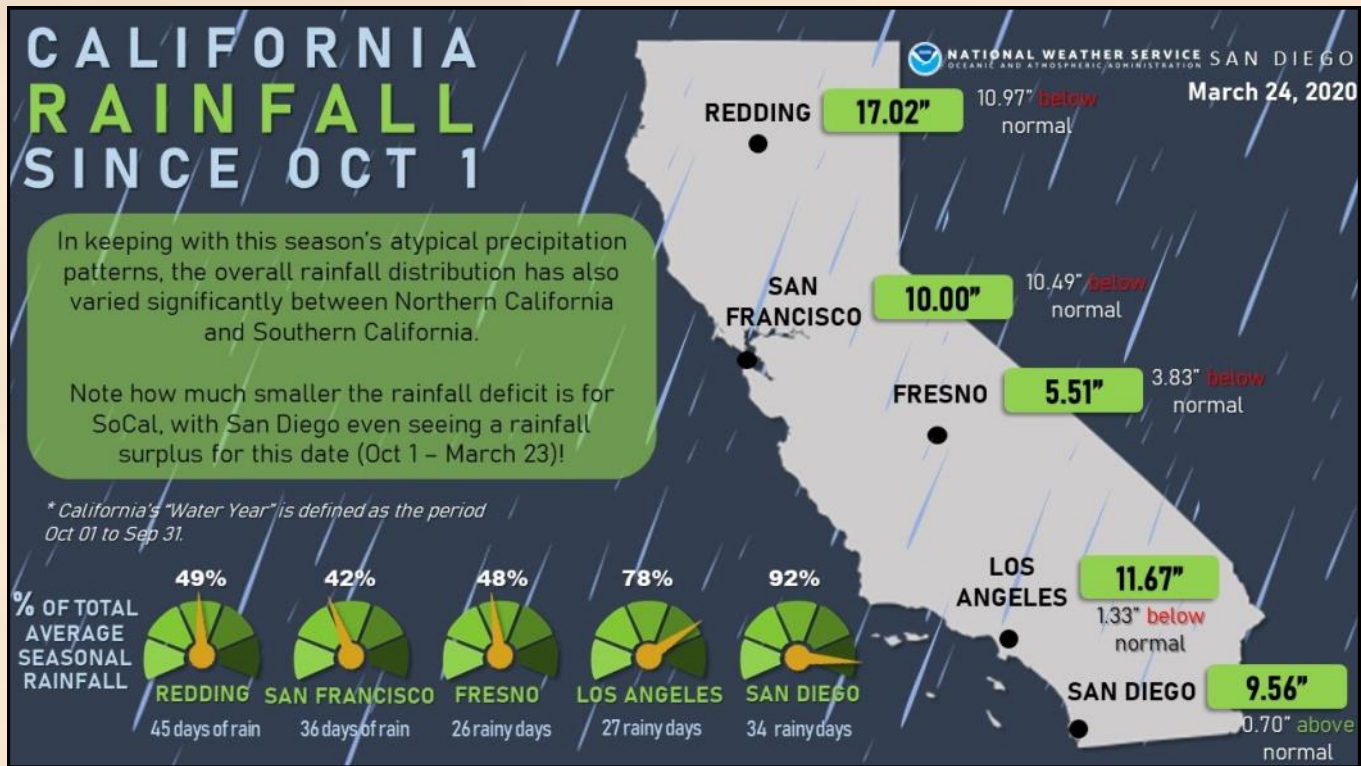


FIGURE 1) Observed precipitation across portions of CA from October 1, 2019 to March 23, 2020. (Source: NWS San Diego)

Despite the active start to the rainy season in late Fall 2019, hopes of an above-average rainfall season began to fade in January across much of the state, with the first month of 2020 seeing significantly below-normal precipitation.

February consolidated this drying trend in remarkable fashion. For a majority of the state, this was the driest February *on record*. Even more astounding and despite the additional leap year day, several cities including San Francisco and Sacramento recorded no measurable precipitation at all through the entire month! For context, their average precipitation for the month of February is 4.06" and 3.47" respectively. The extraordinary rainfall deficit was most pronounced across Northern California and the Central Valley, however monthly precipitation remained below normal for essentially the entire state.

It's a stark contrast to the wet start in November and December, and also a relatively active month of March thus far, making this a rather atypical rainy season when it comes to how precipitation has been distributed throughout the season. Moreover, the differences between southern and northern portions of the state are especially intriguing. In fact, some parts of extreme Southern California, including San Diego, are actually *above* normal in terms of precipitation for this time of year. Overall though, the so-called "March Miracle" didn't quite materialize, with Northern California continuing to run well below normal (between 10-11" less in Redding and San Francisco) for this date as we near the beginning of the state's dry season.

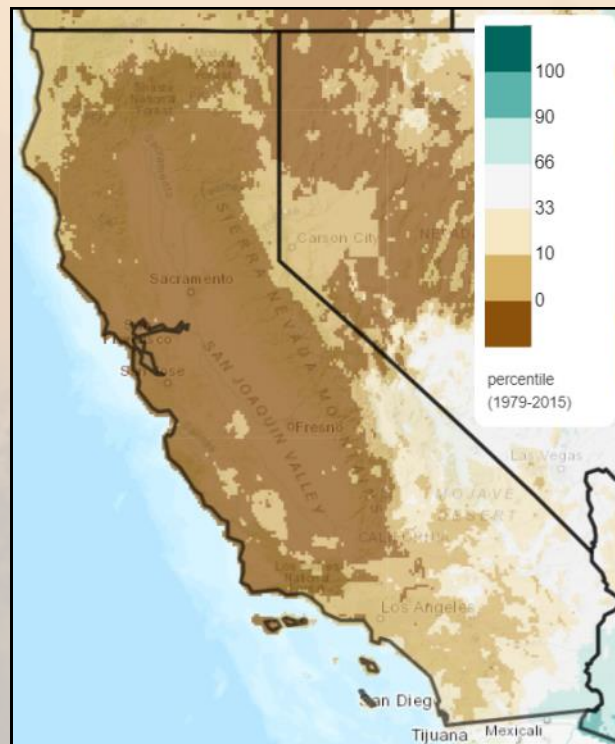


FIGURE 2) February 2020 precipitation percentile (percent of normal). (Source: climatetoolbox.org)



## 2020 Summer Climate Outlook

from Jimmy Taeger

Will this summer be unseasonably warm? Are we going to have an active monsoon thunderstorm season? The Climate Prediction Center's summer outlook is our first hint of what may be to come! The graphics below show an outlook of temperature and precipitation over meteorological summer (June, July and August). In regards to temperature, the whole state of California has an above normal chance of a warm summer. This means there's a greater chance of warmer days than cooler days or even days near seasonal normals. The precipitation outlook is more in the middle, with no clear signal of what's to come. Therefore, equal chances (EC) has been assigned to all of California,

meaning there's an equal chance of above normal, near normal or below normal precipitation.

Although this may sound like a broken record over the past few years with the temperature outlook almost always being above normal, the outlooks may change for next summer when new climate normals are released. Deviations from "normal" are currently based on a 30 year average from 1981-2010, and the new data set of data from 1991-2020 will likely skew future outlooks. These 30-year datasets are updated every 10 years. It's something to keep in mind when outlooks next year come out.

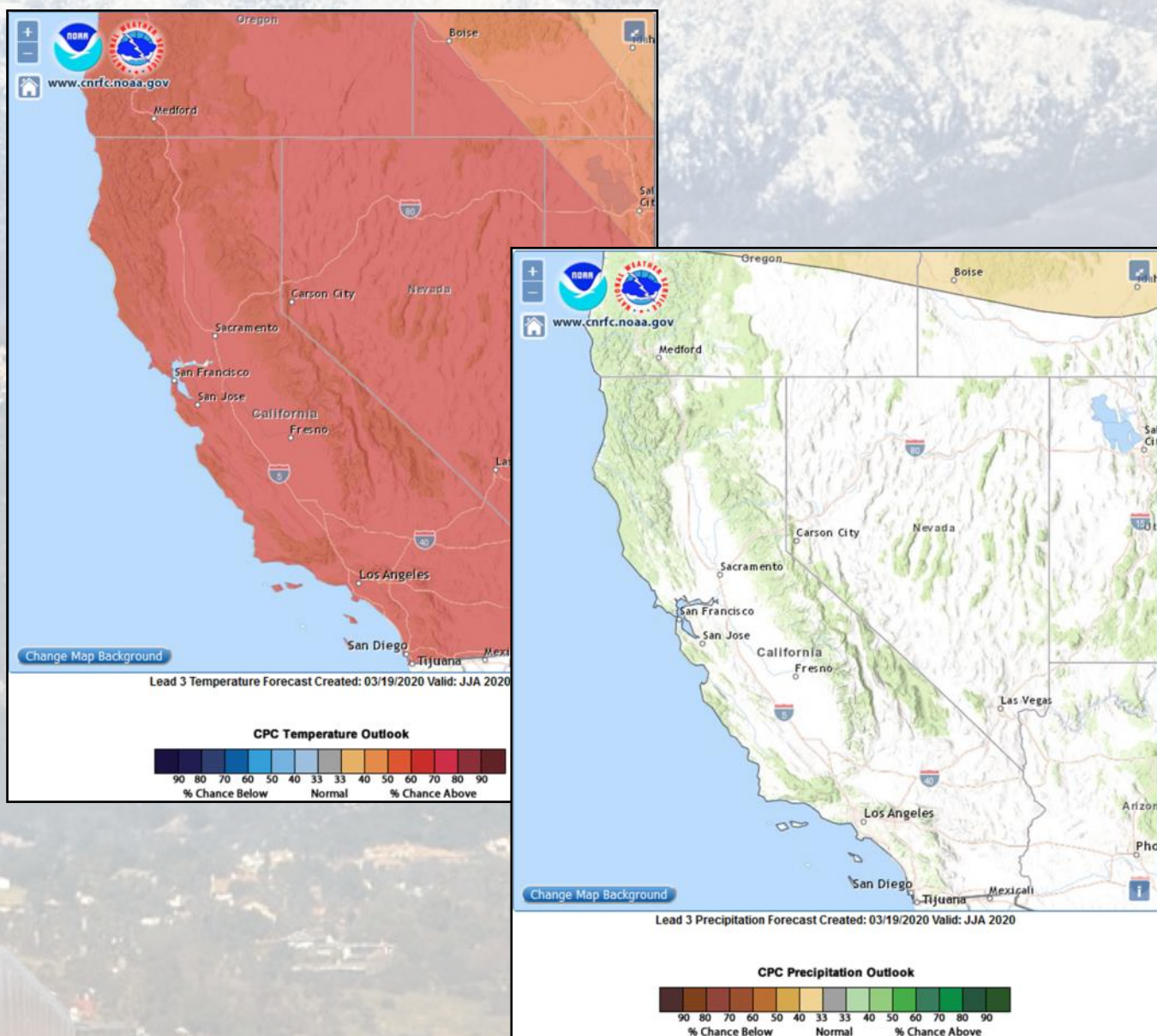


FIGURE 1) Climate Prediction Center's Summer (June, July, August) outlook for temperature and precipitation. (Source: cnrhc.gov)





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California Travel Guide



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## California Cumulonimbus

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### What is CoCoRaHS?

CoCoRaHS, which stands for Community Collaborative Rain Hail and Snow Network, is a non-profit group of volunteer precipitation observers. Anyone can join, and it's easy to report the information. All you need is a 4 inch rain gauge, the internet, and a few minutes each day. The website is easy to navigate and has different instructional materials for anyone to learn how to record an observation.

The site also has daily maps of observer's reports showing where precipitation fell the day before. It's fun to compare the different amounts of precipitation that can fall in an area from just one storm. Not only is the information interesting to look at, it is very valuable for organizations such as the National Weather Service, hydrologists, farmers and many others.

Visit [cocoahs.org](http://cocoahs.org) to sign up. Join CoCoRaHS, today!



Rain gauge required for the program.



[cocoahs.org](http://cocoahs.org)



[California CoCoRaHS State Webpage](http://California CoCoRaHS State Webpage)



[California CoCoRaHS](http://California CoCoRaHS)



[weather.gov](http://weather.gov)