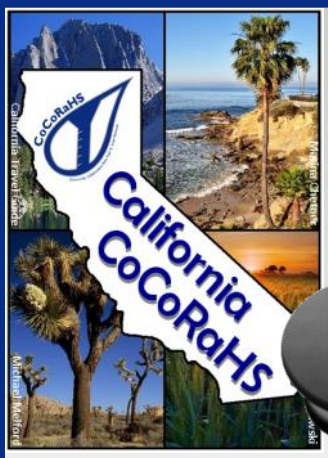


California Cumulonimbus

Fall 2020

Articles in this Edition:

New CoCoRaHS Interactive Map

by Bruno Rodriguez

After several months of development and testing, the new national CoCoRaHS mapping system is now available to the public! This replaces the older mapping version, and leverages GIS technology to provide a more user-friendly experience.

You can view the new mapping system at **maps.cocorahs.org.** The map is interactive, allowing users to zoom to an area of interest and click on individual observations to expand site-specific information.

The GIS-based system incorporates additional functionalities and features. Users can now select a date range such that multi-day accumulations of rain and snow can be displayed. Moreover, there's a larger array of variables available, which now include hail and significant weather reports. Users also have the ability to change the units displayed, toggle several map overlays on or off (e.g. NWS County Warning Areas), and select different color schemes!

Finally, the map layers function at the top right provides a number of map types to choose from, ranging from satellite imagery to topographical maps and even dark mode for improved contrast.

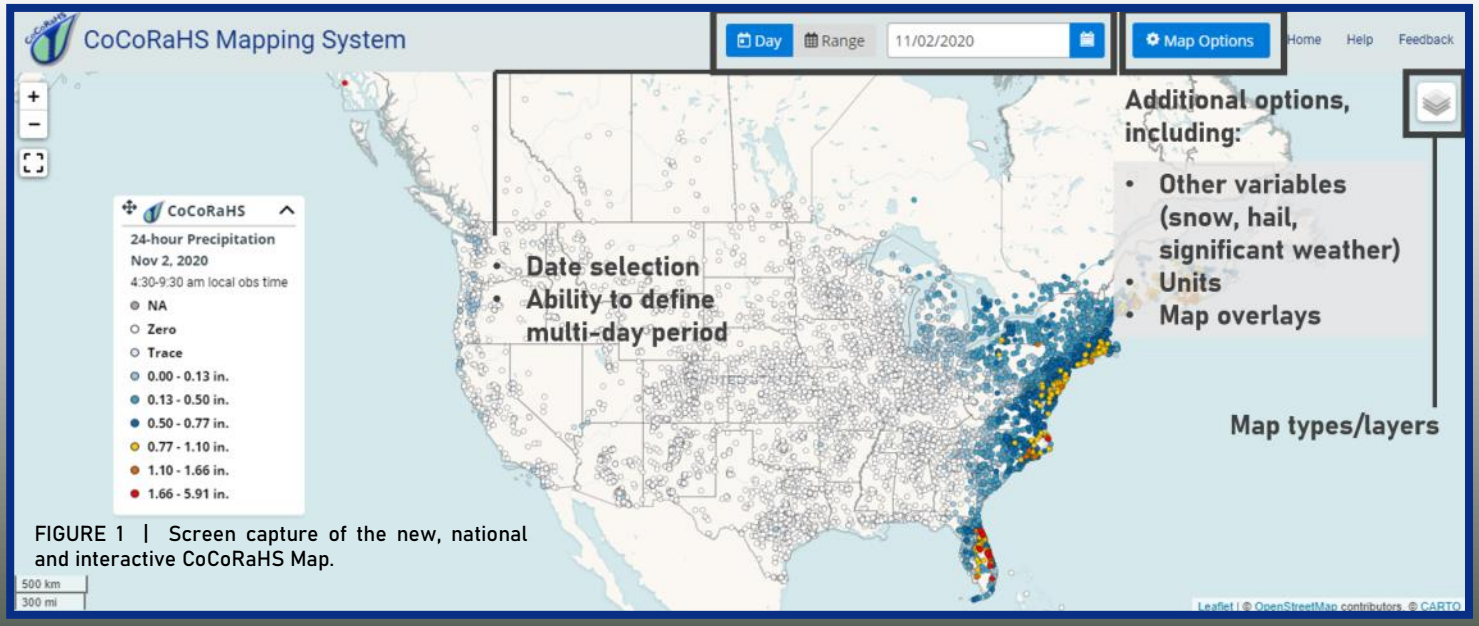


FIGURE 1 | Screen capture of the new, national and interactive CoCoRaHS Map.

Do you have any ideas or suggestions of future topics that you would like to see covered in this newsletter? If so, simply send an email to Bruno at bruno.rodriguez@noaa.gov!

Flood After Fire — Winter Debris Flow Hazards

by Bruno Rodriguez

Extraordinary doesn't even begin to describe the 2020 fire season, one which has been record-setting in numerous ways. More than 4% of California land has been charred so far this year (Figure 2), smashing the previous record for most acres burned in a given year.

The sheer scale of this year's fire season presents a unique and very noteworthy challenge as we head into our wet season—a widespread potential for flooding and debris flows for areas in the vicinity of the dozens of huge burn scars dotted across the state.

Of course, not all burn scars present the same level of risk. A burn scar's individual threat is assessed after-the-fact by specialized federal (BAER) and state-level (WERT) teams. These groups of experts evaluate the damage produced by the fires, the burn severity of soil and vegetation, and other factors such as terrain that can influence the probability of debris flows across a fire's area, as well as potential impacts to communities downstream of a burn scar.

The greatest debris flow threat generally occurs with burn scars where soil burn severity was high (due to intense combustion), terrain is steep, and for communities located in vulnerable locations downstream of high-risk basins.

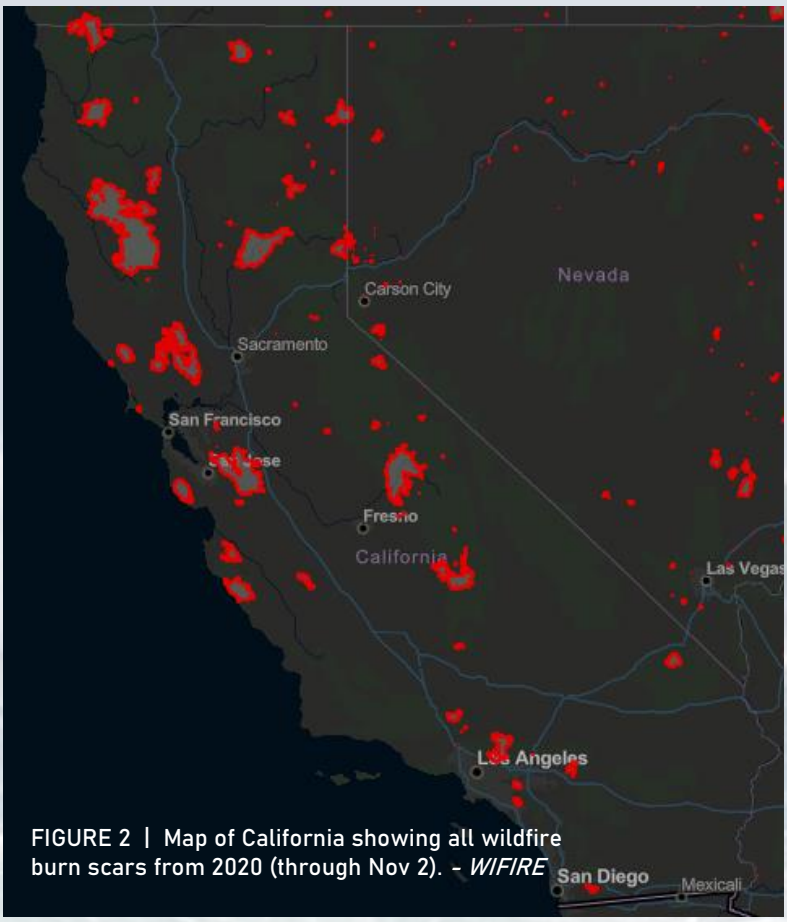


FIGURE 2 | Map of California showing all wildfire burn scars from 2020 (through Nov 2). - *WIFIRE*

California is not unaccustomed to debris flows. A little under 3 years ago, in January 2018, feet of rocks and mud rushed down the slopes of the Santa Ynez Mountains into Montecito, burying homes and resulting in approximately two dozen fatalities. The Thomas Fire, which was not yet 100% contained, experienced exceptionally heavy rainfall courtesy of a potent atmospheric river. Though an extreme event, it shows just how vulnerable some communities may be if the right ingredients align.

This year, emergency officials are rushing to evaluate debris flow risks for local communities from the multitude of California burn scars, and developing plans and protocols to help keep folks safe.

One Southern California burn scar that has officials worried is the El Dorado scar, located in the San Bernardino Mountains near the city of Yucaipa. Much of the steep Yucaipa Ridge, located between the small communities of Oak Glen and Forest Falls, was charred with varying degrees of severity. This ridge is notorious for accumulating some of the highest rainfall totals during atmospheric river events, and the communities nestled within its drainages are prone to flash floods even in the absence of a burn scar. Ultimately though, debris flow risk is inherently tied to rainfall intensity, rather than storm total rainfall The most critical conditions that are conducive to triggering debris flows are bursts of very intense but often short downpours, which can quickly overwhelm the hydrophobic ground producing excessive runoff.

Various agencies including the US Forest Service, National Weather Service, San Bernardino OES, and other local and county-level departments continue to work diligently to prepare potentially vulnerable communities, and develop emergency plans. Community outreach events have been held to help raise awareness of the risks to places such as Oak Glen or Mountain Home Village. These actions are being reflected across communities all around the state, as California nears its wettest season. This year's debris flow challenges are larger than ever, but local, state and federal agencies are rising to the occasion to help keep our communities safe.

La Niña Conditions This Winter

by Samantha Connolly, with contributions by Miguel Miller

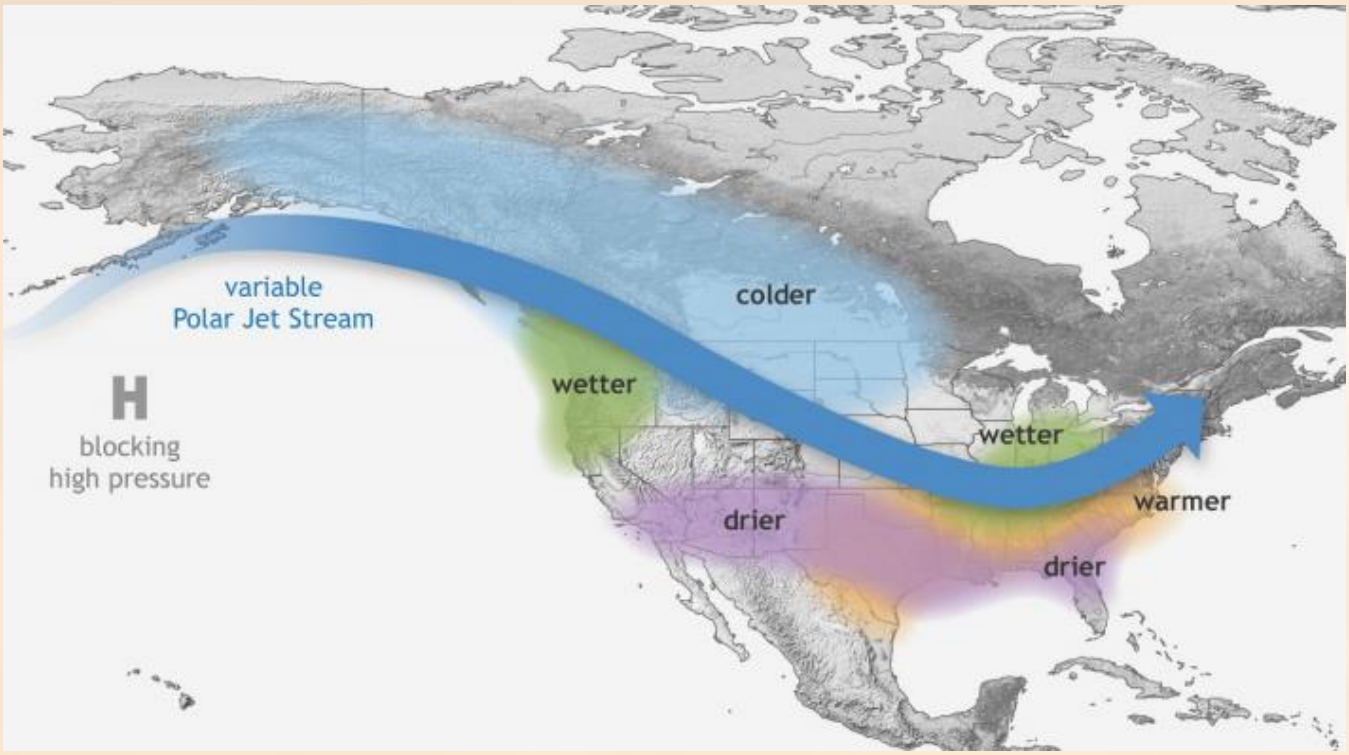


Figure 3 | General patterns typically observed during La Niña

With La Niña conditions present and expected to continue into the winter season, how will winter in California play out? The Climate Prediction Center released its winter outlook on October 15th, which shows greater than normal chances of a warm and dry winter for California. (Figure 4).

La Niña's altered atmospheric circulation over the Pacific Ocean affects global weather and climate. While every ENSO event (and every winter) is different, La Niña can make certain outcomes more likely. In a La Niña pattern, typically the jet stream sets up across the northern Pacific Ocean, and steers winter storms north into the Pacific Northwest and northern California (Figure 3). Since most storms are steered northward, central and southern California tend to be drier during La Niña years.

While La Niña conditions often lead to drier than normal winters for most of California, sometimes there can be surprises. La Niña was present in both the winters of 2016-2017 and 2017-2018. In Southern California, the winter of 2016-2017 was wet while the winter of 2017-2018 was dry. Nevertheless, the state of the El Niño-Southern Oscillation (ENSO) can help inform and add value to long range weather forecasts.

2020-21 Winter Climate Outlook

from Bruno Rodriguez

After what has been the record hottest summer for much of the state, many are wondering what this winter may hold in terms of temperatures and precipitation. On October 15th, the Climate Prediction Center (CPC) released their latest 3-month temperature and precipitation outlooks, covering the winter months of December through February. These seasonal outlooks can help provide some insight into potential departures from normal for the coming months.

In large part, these latest outlooks reflect the type of winter pattern typically associated with a La Niña event. La Niña is currently present, indicating cold water temperature anomalies across the equatorial Pacific. Forecasters expect La Niña conditions to persist through winter, and potentially into spring as well. But, what does that mean for California? (read on)

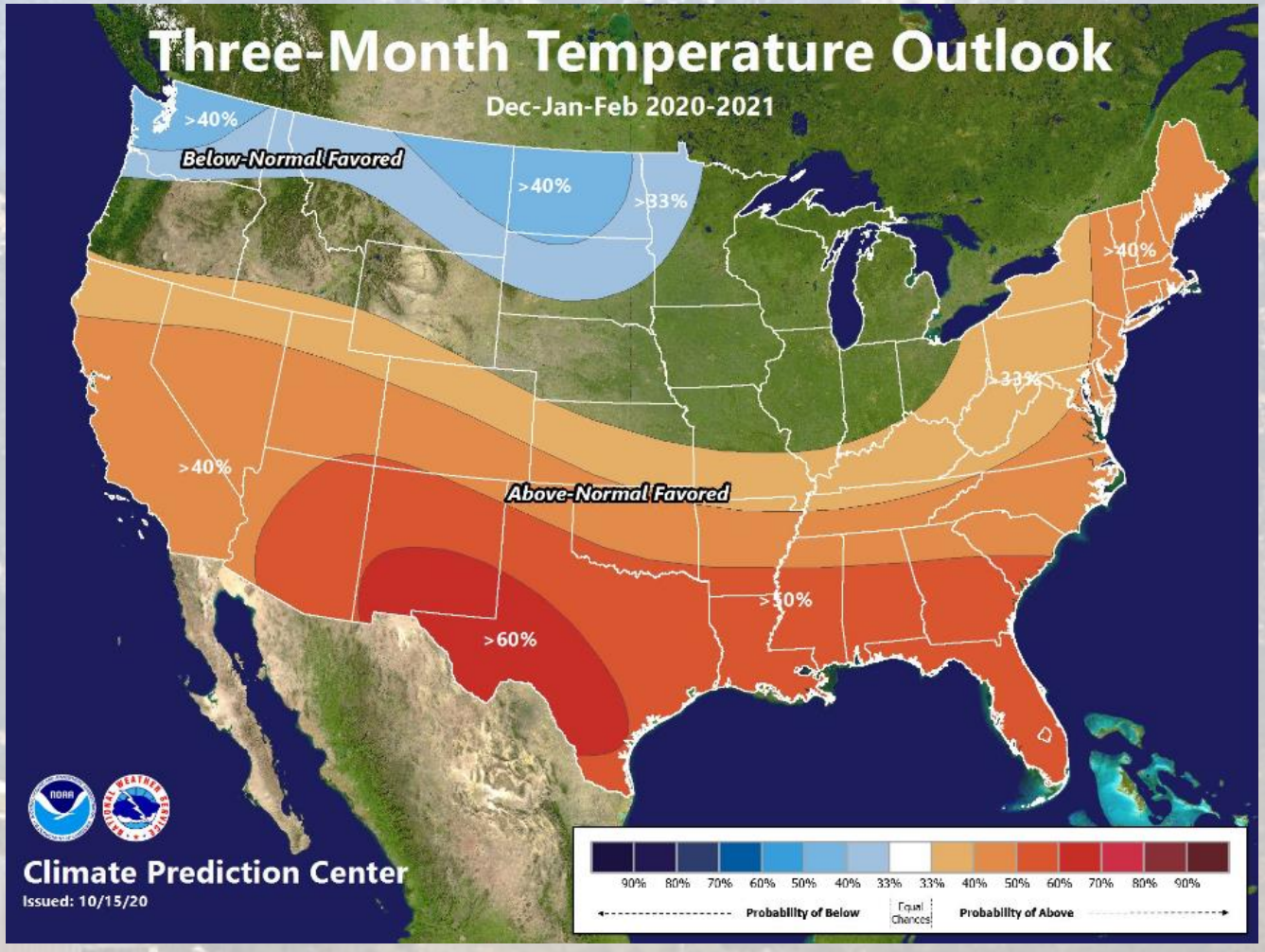


Figure 4 | Climate Prediction Center's Winter (December-January-February) outlook for temperature.

2020-21 Winter Climate Outlook

from Bruno Rodriguez

As depicted by the CPC seasonal outlook, warmer than normal conditions are favored for the entirety of the state (Figure 4, page 4), with the strongest signal of anomalous warmth centered over southeastern California, where there is a 40-50% chance for above-normal temperatures (and, correspondingly, a 17-33% chance of below-normal temperatures). For NorCal, above average temperatures are slightly favored (33-45% chance), with corresponding 21-33% chances of below normal values.

The signal for precipitation is not quite as strong (Figure 5). Drier than normal conditions are slightly favored for most of the state, particularly southern portions, with a 33-40% chance of below-normal precipitation. Of course, despite the minor correlation between La Niña and drier California winters, this does not necessarily imply the state won't see significant storms. However, with drought conditions expanding across the western United States, the overall indication of a drier and warmer than normal winter is not particularly good news for California.

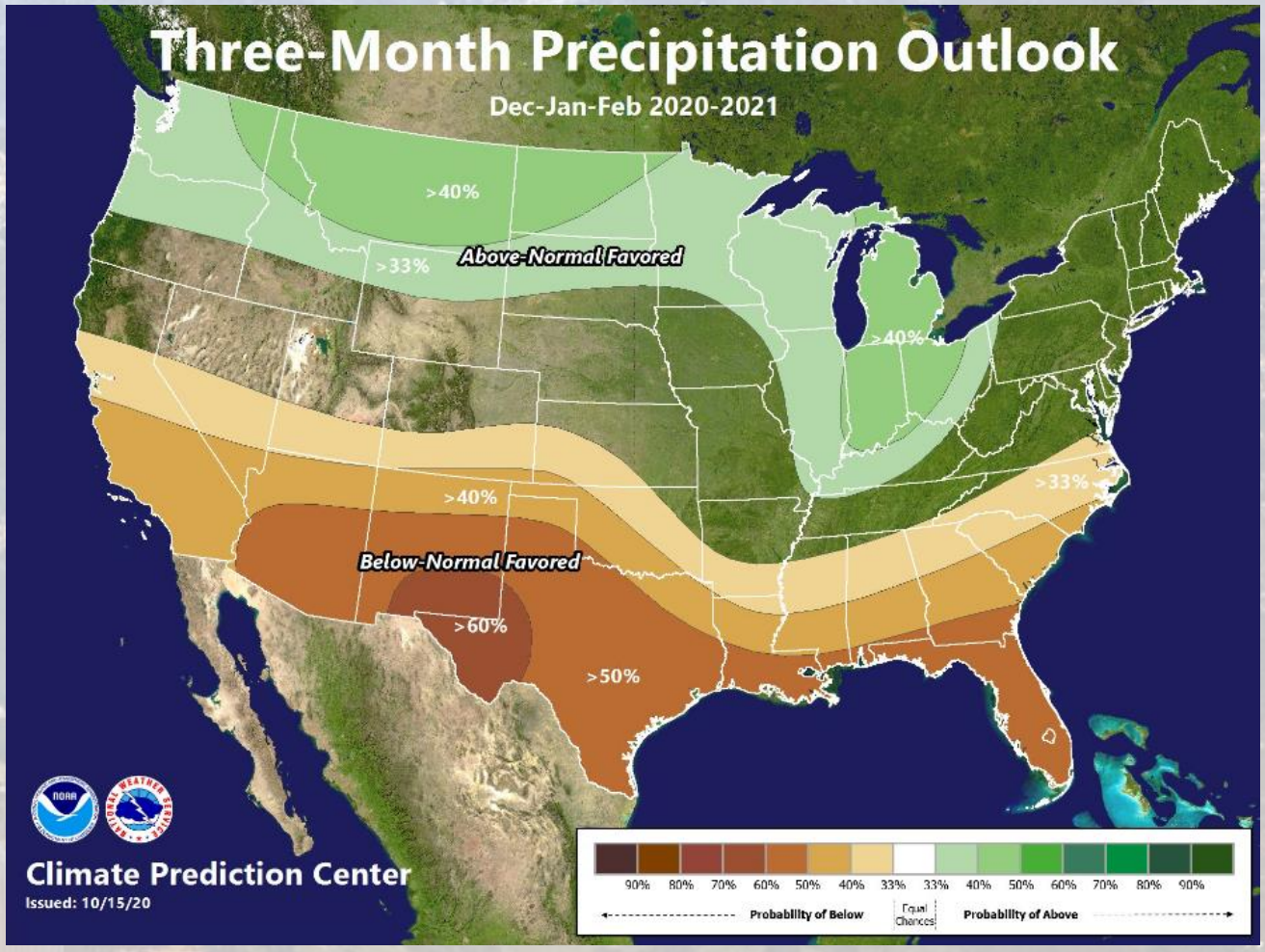
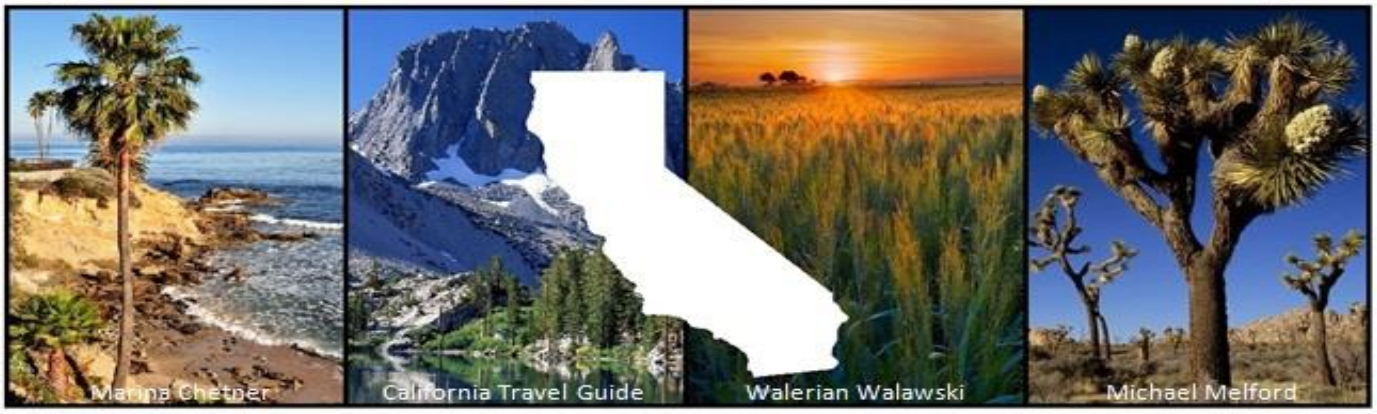


Figure 5 | Climate Prediction Center's Winter (December-January-February) outlook for precipitation.

California CoCoRaHS



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 cocorahs.org to sign up. Join CoCoRaHS, today!

Rain gauge required for the program.

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cocorahs.org | California CoCoRaHS State Webpage | California CoCoRaHS | weather.gov