National Weather Service

California Nevada River Forecast Center

Spring 2008 Newsletter

HIC's Corner

By Rob Hartman
Hydrologist in Charge

Thank you for taking the time to browse through our newsletter. Here at the CNRFC, we're placing more and more emphasis on customer service and meeting customer requirements. One of the things I'm consistently asked is, "How good are your forecasts?" I'm also frequently asked if our forecasts are better today than they were ten or twenty years ago.

The answer to the first question is difficult because there are so many conditional factors. There's even a lot of disagreement over how to verify a hydrologic forecast. If you forecast the peak stage correctly but at the wrong time, is that a hit or a miss? Or is it a double miss because it didn't occur when you said it would and it did occur when you said it wouldn't? Yikes! National and Regional teams are currently working on this and one of our hydrologists, Alan Takamoto, is currently serving on both of these teams. The answers won't come quickly or easily, but we're excited about using this information to direct our development efforts and to provide it to customers who need a basis for trusting (or dis-trusting) the forecasts we issue.

Dramatic improvements in the accuracy of hydrologic forecasts will be very hard to come by. I suspect they've improved slightly over the past ten years and will continue to slowly improve in the future. At the same time, dramatic improvements in the utility of the forecasts can be achieved by understanding and leveraging the associated uncertainty. Probability and statistics scare most folks pretty badly, but this really is the "brass ring" for hydrologic forecasting service in the coming decade.

To achieve this, the National Weather Service Hydrology Program is actively engaged in a project called the eXperimental Ensemble Forecasting System, or XEFS. We've used ensemble methods to generate longer term forecasts (water supply volume) for more than 20 years, but moving into the near-term flood forecasting domain is another kettle of fish. National plans have been developed and our goal is to deliver an operational system to RFCs to support ensemble-based services within three years. We're also engaged with the international community to tackle the difficult science challenges through the Hydrologic Ensemble Prediction Experiment (HEPEX, see http://hydis8.eng.uci.edu/hepex).

Should you be interested? Absolutely. When the CNRFC issues a flood forecast, do you ever wonder what the chances are that the river will actually rise two feet higher than forecast? Wonder no more. Aside from the scientific challenges, we have significant challenges in (1), conveying the uncertainty (risk) information in a fashion that can be understood and used and (2), helping our customers understand and leverage the uncertainty information in their decision making process. As this process moves forward, we're going to need your help. If you're interested in participating, please let me know. For more information and background related to ensemble forecasting, go to our website and click on Publications.

Thanks again for taking the time to read through this newsletter. At the CNRFC, we're always interested in your comments, suggestions, and feedback. Please feel free to drop me a note any time at:

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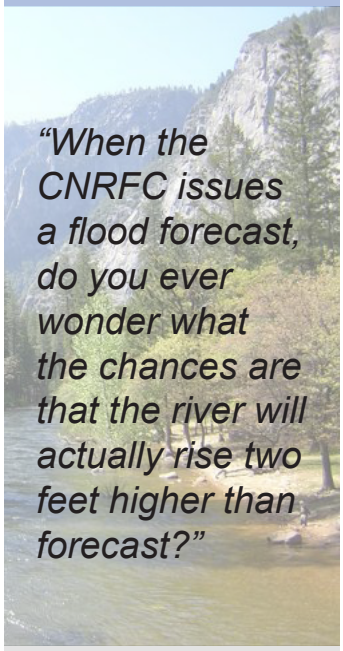

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WY 2008 Climate Update – A Dry La Niña

By Pete Fickenscher

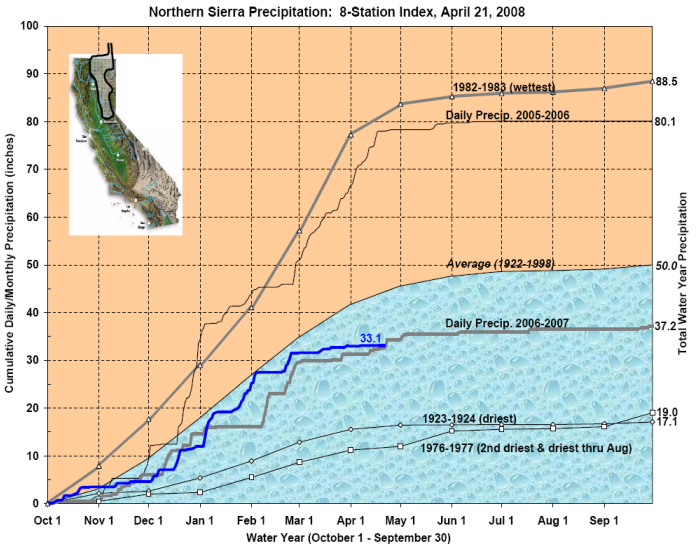
As the end of April nears, we are little over halfway through the first moderate/strong La Niña water year since 2000, arguably the strongest La Niña winter since 1974. Weather patterns generally followed the La Niña norm. For example, the start of the water year was wetter than normal followed by a dry late winter/early spring. Also, the one river which exceeded flood stage this past winter (the Navarro River) was in the northern third of the state (the norm for La Niña winters is for a greater risk of flooding in the north). One welcomed change from the La Niña norm was the rainfall experienced in Southern California, where several stations are currently showing rainfall totals over 100% of average.

As the wet season for Northern California and Nevada nears its close, the overall picture is less than hoped for in terms of water supply. While the April 1st snow pack measurements are encouraging (generally 90 – 115% of normal), these good numbers can be deceiving. With the 8-station index at just over 33 inches, it is currently at just 75% of normal, with virtually no chance of reaching 100% by October. Also, the water year started out dry, especially in the month of November.

Then when wet storms arrived from December to February, many of the storms were much colder than normal with very low snow lines. Snow was a common occurrence in the 3000-4000 foot elevation range, and even lower on several occasions.

So the overall situation we find ourselves this spring is that we have a near average snow pack lying on top of ground that is much drier than normal. As a result, spring runoff is forecast to be below average in many basins. Also, coming after the dry WY 2007, reservoirs are much lower than normal for this time of year. While there is still the chance for a wet end to the water year, our water supply status looks to be even more tenuous than last year.

What can we expect in the future? While La Niña conditions have weakened in March, there is a good chance that La Niña will continue into the coming water year. About 50% of the dynamic models indicate at least a weak La Niña in the fall. Historically, La Niñas tend to last longer than El Niños. Of the top 10 La Niñas, only two lasted less than one year. Additionally, of the six La Niñas that lasted two years or more, four of these were wetter than normal for Northern California. So hope remains, even after two dry years.



California Dept. of Water Resources

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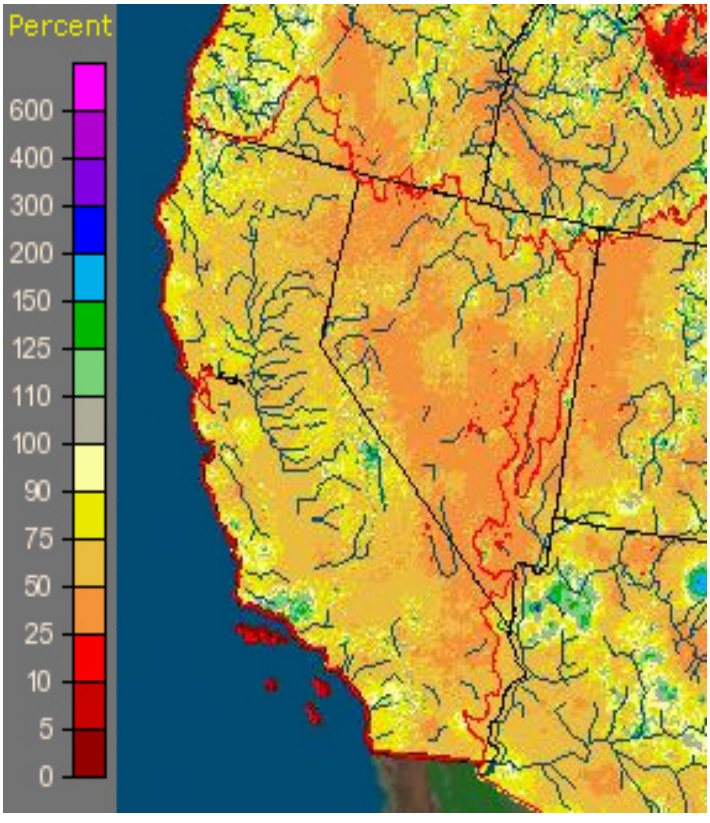

Percent of Normal Precipitation
Oct 1, 2007 - April 24, 2008

NOAA/USGS Debris Flow Early Warning System - A success story from this winter's operations at the Los Angeles/Oxnard Weather Forecast Office

By Jayme Laber
Service Hydrologist
WFO Oxnard/Los Angeles

Once the smoke clears from a wildfire, the danger is not over. Other hazards, such as flash floods and debris flows, now become the focus. Areas recently burned by wildfires are particularly susceptible to flash floods and debris flows during rainstorms.

In 2005, the National Weather Service (NWS) and the United States Geological Survey (USGS) partnered together to establish a flash flood and debris flow early warning system for recently burned areas in Southern California.

Since being established, debris flow outlooks, flash flood watches, and flash flood warnings for flash flooding and debris flows from recently burned areas in Southern California have been disseminated by the Los Angeles/Oxnard and San Diego weather forecast offices to emergency management personnel and the public. An extremely important aspect of the early warning system is the outreach efforts undertaken by both NWS offices with the impacted local emergency managers and residents. The 2007-2008 winter season provided some very good examples of just how powerful and dangerous flash flooding and debris flows from recently burned areas can be, as well as a remarkable example of how well the early warning system worked for a storm event in early January 2008.

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In March 2007, the Barham fire burned 180 acres adjacent to the City of Los Angeles's Griffith Park. Although not that large of a fire, its proximity to Forest Lawn Drive and the fact that all runoff from the burned area was directed towards a debris basin with an outlet onto Forest Lawn Drive, made this a burn area to keep a watchful eye on during subsequent rain events. Just such an event occurred on the afternoon of Sept. 22, 2007, when thunderstorms rolled across the burn area. Between 12:30 and 12:38 PM, the burn area received 0.36 inches of rainfall in just 8 minutes. A few minutes later, the debris basin at the lower end of the burn area and just adjacent to Forest Lawn Drive overflowed onto the road, trapping nearly a dozen cars and drivers. Fortunately, no lives were lost in this incident.

Again on January 4, 2008, moderate to heavy rainfall returned to Southern California and took aim at the Barham burn area. The Los Angeles/Oxnard NWS office issued a flash flood warning for debris flows for the Barham burn area at 6:15 PM in the evening as rainfall exceeding USGS rainfall guidance was approaching the burn area. The Griffith Park rangers, upon receiving the notice of the flash flood warning for debris flows for the Barham burn area, did not waste any time taking action, as the events of September 22 were still fresh in their minds. The park rangers called both the Los Angeles Police and Fire Departments for assistance with road closures on Forest Lawn Drive in the vicinity of the burn area and the removal of parked cars along the roadway. Shortly after closing the roadway and clearing parked cars, the debris basin once again overflowed onto Forest Lawn Drive at 7:00 PM. But this time the outcome was slightly different. Yes, there was debris on the roadway again, but no cars or people were in harms way. The 45 minute lead time given to the Griffith Park rangers and the Los Angeles Police and Fire Departments and the actions taken by all may have saved lives that evening.

September 22, 2007 - Forest Lawn Drive below the 2007 Barham burn area. Photo courtesy of the Los Angeles Daily News

To learn more about the NOAA/USGS debris flow early warning system in Southern California, visit our Debris-Flow Project web page.

Spring Water Supply Outlook 2008

By Scott Staggs

After near normal monthly precipitation in December, January, and February…March precipitation was well below normal in most of the CNRFC forecast area. In contrast, April 1st snow pack measurements remained near to above normal, despite the lack of precipitation in March. However, March runoff was also below normal. The result was an April 1st spring runoff forecast that is below normal in most areas.

Despite a dry March, seasonal averages of precipitation, October 1 through April 1, were 70 to 100 percent for basins on the west slope of the Sierra Nevada. Seasonal precipitation for the eastern Sierra Nevada basins was slightly better, ranging from 75 to 100 percent of normal. The Humboldt and the Upper Klamath basins were much better, averaging about 100 percent of normal seasonal precipitation.

The dry March also led to a 10 to 20 percent drop in snow pack water equivalents since the March 1st measurements. Even with this drop, the April 1st snowpack was 95 percent of average for the Sacramento and San Joaquin basins. The Tulare basins had a snow pack that was around 115 percent of average. Snow pack measurements in the basins of the eastern Sierra Nevada showed a snow pack in 85 to 90 percent range. Again the snow packs in the Humboldt and Upper Klamath basins were the best, at 105 and 130 percent, respectively.

March runoff has been a concern in the water supply forecast. Overall, March runoff was below to much below normal. March runoff ranged from 35 to 60 percent of average in the eastern Sierra Nevada and Humboldt basins. The Sacramento, San Joaquin, Tulare, and Upper Klamath basins averaged 50 to 70 percent of average March runoff. Runoff can be an indicator of soil moisture conditions. Most basins in the CNRFC forecast area received very little precipitation from March through September 2007, creating dry soil moisture conditions by the fall. In addition, this past winter's precipitation primarily fell as snow in most water supply basins, and the dry soil moisture conditions persisted under the snow pack. The concern is that some of the runoff from snow melt may be absorbed into the dry soils, resulting in reduced runoff available for water supply.

The spring water supply forecasts on April 1st ranged from below normal to near normal for the CNRFC forecast area. April through July runoff volume forecasts were 75 to 100 percent of normal for the Sacramento, south to the Kern River basins. The Truckee, Carson, and Walker river basins were forecast to be 70 to 90 percent of normal. The Humboldt and Upper Klamath basins were forecast near 100 percent of normal.

Of further concern, since the April 1st water supply forecast, the dry conditions have persisted throughout the CNRFC forecast area. The result has been up to a 15 percent drop in the spring runoff forecasts in many basins since April 1st. Reservoir storage in the CNRFC forecast area is less than last year at this time, but still remains good. Reservoir storages on the west slope of the Sierra Nevada are around 85 percent of normal. On the east slope of the Sierra Nevada, reservoir storage is not as good, at about 60 percent of normal. Overall, despite the dry conditions, spring runoff and adequate reservoir storage carryover from last year should prevent any major water shortages in the CNRFC forecast area.

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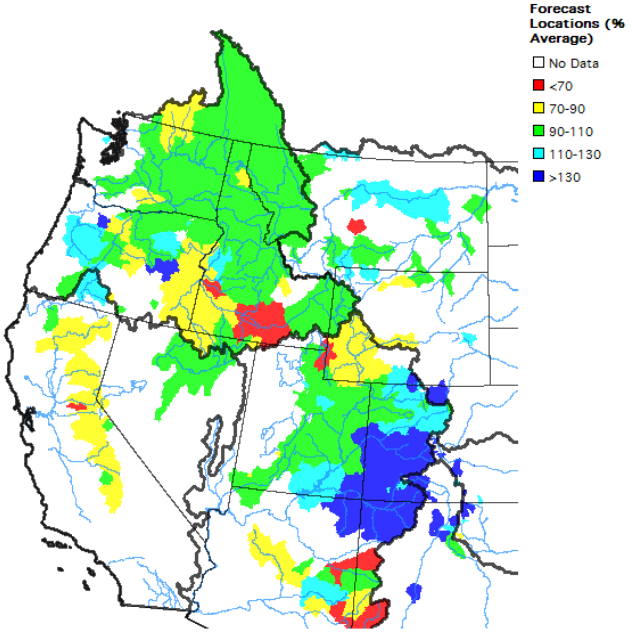

Water Year 2008

http://www.nwrfc.noaa.gov/westernwater/