

Drought Update: Where Do We Stand?

This Year vs. Last Year

Drought conditions have improved over most of Arizona and New Mexico—but unfortunately, *improved* is not the same as *ended*. According to the July 16, 2002 Drought Monitor, the entirety of Arizona and New Mexico was experiencing some degree of drought, with most of the northern portions of both states classified as “exceptional” and most of the remainder in extreme drought. Fortunately, conditions in the June 10, 2003 edition of the Monitor show very limited areas of exceptional drought; extreme drought is confined to northern areas of each state; severe to moderate conditions prevail elsewhere.

Despite some improvement, the drought is definitely not over. U.S. Secretary of Agriculture Anne Veneman again declared Arizona a drought disaster area in May of this year, just as she did in May of 2002. The 2003 drought declaration seeks \$232 million in federal aid.

Gov. Bill Richardson recently declared a drought-related state of emergency in New Mexico, which makes New Mexico eligible for federal money to spend on firefighting, water supplies, and other forms of drought relief. Rio Grande streamflow and reservoir storage are expected to be at around half of the long-term average this summer.

Snowpack was again far below average in Arizona and New Mexico, and consequently lower-than-average flow is expected on the Colorado River. Lake Powell inflow was estimated in May 2003 to be 57 percent of average, compared to 38 percent in April 2002. Improvements have been more significant in the Salt and Verde river systems: the Salt River was projected to be at 11 percent of average in April 2002, but 109 percent of average in April 2003, and the Verde has gone from 24 percent of average volume to 103 percent in the space of a year (1). These rivers supply Phoenix with about three-quarters of its drinking

water. More broadly, to meet the demands of Arizona, Nevada, and California, water managers will have to draw further on water stored in Lakes Mead and Powell.

La Niña Looms Large

Although overall drought conditions in Arizona and New Mexico may be marginally better, the likelihood of the drought ending any time soon is considerably lower than it was at this time last year. In July 2002, when the END InSight Initiative began, an El Niño event was building in the Pacific. El Niño conditions often, but not always, bring greater than average precipitation to the Southwest. As 2002 wore on, this particular ENSO event remained in the moderate range and brought below-average to slightly above-average precipitation to the Southwest.

Currently, sea surface temperatures in the equatorial Pacific Ocean are declining, indicating that a La Niña event may be developing. Whether this La Niña will continue to develop and its likely strength will become evident within the next month or so. La Niña is more consistent in bringing drier weather to the Southwest than El Niño is at bringing wetter conditions (Figure 1). This is particularly true when the Pacific Decadal Oscillation (PDO) is in its negative phase, as it is currently believed to be.

Researchers also have discovered that although recent La Niña events have rarely lasted longer than two years, such conditions have persisted during, and apparently been responsible for, some of the most severe and prolonged droughts in U.S. history (2). For example, a La Niña event that lasted from 1855-1863 coincided with drought across the western United

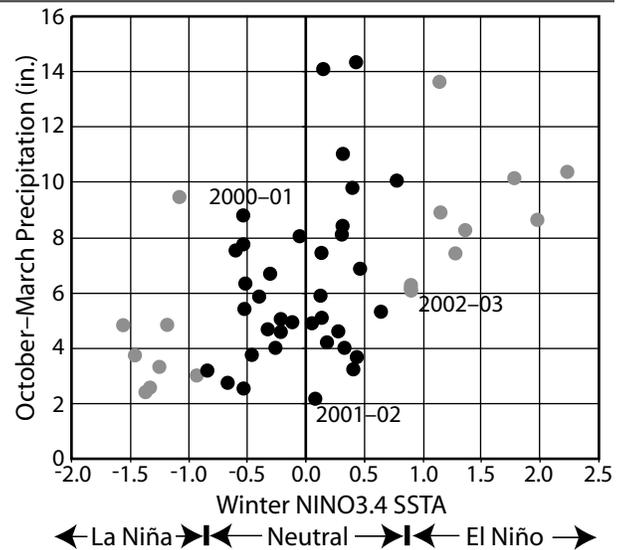


Figure 1. Arizona statewide winter precipitation versus the NINO3.4 sea surface temperature anomaly (SSTA) index for 1951 through 2003. The NINO3.4 SSTA index is a measure of El Niño-Southern Oscillation (ENSO) activity in the equatorial Pacific Ocean. Black dots indicate neutral ENSO conditions and grey dots indicate either El Niño (positive SSTA) or La Niña (negative SSTA) conditions.

States. Researchers have documented La Niña-related mechanisms through which drier land conditions lead to less evapotranspiration and increased surface temperatures, which can prolong drought further.

So while at this time last year there was some hope that El Niño might break the drought that has gripped much of the Southwest for the past four years or so, such optimism has evaporated. Even if the monsoon rains are above average, the chances of a wet winter of the magnitude that would be required to refill reservoirs, improve grazing conditions, dampen wildfire danger, and revive wildlife habitat are slim.

References

- (1) Natural Resource Conservation Service. Streamflow forecast probability charts, selected stations. Accessed at http://www.wcc.nrcs.usda.gov/cgibin/strm_cht.pl on June 17, 2003.
- (2) Cole, J., J. Overpeck and E. Cook. 2001. Multiyear La Niña events and persistent drought in the contiguous United States. *Geophysical Research Letters*, 29:10.1029/2001G013561, 25-1-4.

