Issued: August 30, 2007

Southwest Climate Outlook

The University of Arizona

Source: Steve Novy, Institute for the Study of Planet Earth

Photo Description: A storm moving across the city of Tucson on July 23, 2007. This photo was taken on the top of 'A' Mountain, which is just to the west of downtown.

Would you like to have your favorite photograph featured on the cover of the *Southwest Climate Outlook*? For consideration send a photo representing Southwest climate and a detailed caption to: knelson7@email.arizona.edu

In this issue...

August Climate Summary

Drought – Drought conditions remain at moderate to severe levels across Arizona again this month while most of New Mexico remains drought free. Summer rainfall has improved conditions in eastern Arizona, while below-average precipitation across eastern New Mexico raises the threat of drought conditions potentially developing over coming months.

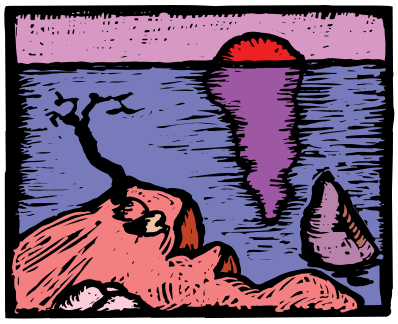
Temperature – Temperatures were generally near average across Arizona while much of New Mexico was 2–4 degrees above average.

Precipitation – Much of Arizona has seen average to above-average precipitation over the past thirty days, while New Mexico generally saw below-average rainfall. Many upper elevation stations in Arizona have recorded 150–200 percent of average precipitation for the period.

Climate Forecasts – Temperature forecasts remain confident that much of Arizona and southwestern New Mexico will see above-average temperatures through the remainder of the summer into the fall. Seasonal precipitation forecasts are calling for below-average precipitation for both Arizona and New Mexico through the fall into next winter due to stronger confidence in the development of La Niña conditions.

The Bottom Line – Summer monsoon rainfall has been widespread across Arizona and has helped improve short-term drought conditions. Below-average rainfall has started to impact portions of central and eastern New Mexico, raising the threat of drought conditions potentially developing over coming months in these areas. Stronger signals of a developing La Niña event are emerging in the equatorial Pacific Ocean, leading to forecasts for below-average precipitation across the Southwest through the upcoming fall and winter seasons.

La Niña on the horizon?



Chances are good that La Niña, the tropical Pacific's winter drought generator for the southwestern United States, will develop this fall, as recent tropical Pacific Ocean temperatures, winds, and cloud cover indicate La Niña-like characteristics. The International Research Institute for Climate and Society predicts a 60 percent chance that La Niña will develop between August and October. The normal probability of occurrence is 25 percent.

For more information on La Niña and its effects in the Southwest, visit the Western Regional Climate Center at http://www.wrcc.dri.edu/enso/enso.html, and the NOAA CPC at http://www.cpc.ncep.noaa.gov/products/precip/CWlink/ENSO/enso.anal.shtml. More climate-savvy readers can check NOAA's weekly ENSO assessment at http://www.cpc.ncep.noaa.gov/products/expert_assessment.

For more info see Figure 14a-b, El Niño Status and Forecast...

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This work is published by the Climate Assessment for the Southwest (CLIMAS) project and the University of Arizona Cooperative Extension; and is funded by CLIMAS, Institute for the Study of Planet Earth, and the Technology and Research Initiative Fund of the University of Arizona Water Sustainability Program through the SAHRA NSF Science and Technology Center at the University of Arizona.

Fall conference roundup

By Gregg Garfin

Ever wonder where you might find a gathering of climate, weather, water, or fire-related professionals bent on discussing cutting-edge science and policy issues? CLIMAS has compiled the following small collection of conferences, workshops, talks, and symposia that touch on issues of key importance to readership in the Southwest. For other related conference listings, please visit The University of Arizona's Institute for the Study of Planet Earth's weekly bulletin at http://www.ispe.arizona.edu/news/bulletin/current.html, Arizona State University's Global Institute of Sustainability Digest at http://sustainability.asu.edu/gios/news/index.htm, and Southwest Hydrology magazine's events calendar at http://www.swhydro.arizona.edu/calendar.html.

Public Lecture on Water Sustainability by Dr. Peter Gleick
Date: August 30, 2007, 7:30 p.m.
Audience: General public
Location: Temple Emanu-El, 225 N. Country Club, Tucson, AZ
Website: http://www.sustainabletucson.org/
Description: Peter Gleick, a 2003 MacArthur Fellow and president of the Pacific Institute for Studies in Development, Environment, and Security, will discuss water policy, environmental change, and innovative strategies for achieving sustainable water use. Gleick is an internationally renowned water expert. His research addresses connections between water, human health, climate change, sustainability, globalization, and conflicts over water resources. Sponsors of the event include Sustainable Tucson, Pima County, Arizona Hydrological Society, Southwest Hydrology, Southern Arizona Leadership Council, Temple Emanu-El, The University of Arizona Water Resources Research Center, and the Institute for the Study of Planet Earth.

The Fourth Symposium on Southwest Hydrometeorology
Date: September 20–21, 2007
Audience: Public and private-sector meteorologists, hydrologists, and climatologists
Location: Tucson Hilton East Hotel, 7600 E. Broadway, Tucson, AZ
Website: http://www.atmo.arizona.edu/swhs
Description: This symposium will provide a forum to discuss and present research associated with weather systems that affect the Southwest, and to discuss the impact of these systems on regional hydrology. The symposium features technical talks and poster presentations. Symposium sessions will examine hydrometeorology, climate science and annual prediction, monsoon forecasting, extreme events, probabilistic forecasting, and quantitative precipitation estimation. Nationally recognized experts from the National Oceanic and Atmospheric Administration, the National Center for Atmospheric Research, State University of New York, and Penn State University will give plenary presentations.

Water Conservation Alliance of Southern Arizona (Water CASA) 10th Anniversary Conference—*Conservation Unplugged*
Date: September 21, 2007
Audience: Water professionals, policy and decision makers, planners, conservationists, and interested members of the general public
Location: Arizona-Sonora Desert Museum, 2021 N Kinney Rd, Tucson, AZ
Website: http://www.watercasa.org/
Description: This event seeks to raise awareness among a broad range of audiences with a vested interest in sound water management. The conference aims to promote consistency in water management programs and policy and to foster collaborative work in water conservation in order to maximize water resources. The conference program features invited presentations from water and energy managers, landscape architects, developers, county and state administrators, and water conservation experts; the presenters are chiefly from Arizona.

2007 Southern Regional Water Program Conference
Date: October 15–19, 2007
Audience: Cooperative Extension and other resource and water professionals
Location: Cosmopolitan Hotel, 70 North East Avenue, Fayetteville, AR
Website: http://www.arnatural.org/water/
Description: This conference will be of interest to cooperative extension, natural resource, and water professionals in the Río Grande River basin. The overall goal of this conference is to strengthen the capacity for natural resource professionals to develop and deliver successful water quality programs by providing an opportunity to share successful education strategies and programs, addressing current and potential water quality and other environmental issues, and by providing a forum for an exchange of ideas and information. Sessions will focus on agricultural pollution control, watershed management, and rural environmental management. The conference is hosted by the University of Arkansas Division of Agriculture, with sponsorship by Cooperative Extension Service Water Quality programs of the 13 land-

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Roundup, continued

grant universities comprising the USDA's Southern Region Water Quality Program.

Ninth Biennial Conference of Research on the Colorado Plateau—Shifting Landscapes on the Colorado Plateau: *the influence of climate change on natural and cultural resources*
Date: October 29–November 1, 2007
Audience: Researchers, resource managers, and environmental professionals
Location: DuBois Conference Center, Northern Arizona University, Flagstaff, AZ
Website: http://sbsc.wr.usgs.gov/cprs/news_info/meetings/biennial/2007/index.asp
Description: This conference focuses on research and resource management efforts related to the physical, cultural, and biological resources of the southwestern United States, with a special emphasis on the Colorado Plateau. The conference will feature technical talks, sessions on special scientific and management issues, and poster presentations. Presenters include academic researchers, agency scientists, and resource managers. The conference also features a special clients day of meetings by and for conference attendees. Thematic sessions will focus on climate and ecosystem change, tribal lands, and many other topics.

American Water Resources Association 2007 Annual Conference
Date: November 12–15, 2007
Audience: Water resources professionals and researchers; some plenary talks, sessions, and discussions may be of interest to policy and decision makers
Location: Embassy Suites Hotel, 1000 Woodward Place NE, Albuquerque, NM
Website: http://www.awra.org/meetings/New_Mexico2007/index.html
Description: This conference will address an extraordinary variety of water-related topics. Conference session topics include water and energy policy, artificial recharge, storm water management, transboundary water resource

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Ensuring Arizona counties are drought ready

By Susan Craig, Arizona Department of Water Resources; and Gregg Garfin, Institute for the Study of Planet Earth

Despite spectacular summer monsoon downpours, drought continues to loom over Arizona and the Southwest. This is the case especially where water year precipitation has been below average (see page 7–current precipitation), such as the western half of Arizona, or parts of northeastern New Mexico. And, as mentioned on page 11 (AZ Reservoirs), Colorado River Basin storage is still well below average. Your input is needed to monitor and help determine how your county will prepare for and lessen the impacts of drought.

"Providing local input on drought conditions is important so that state-level drought monitoring and reporting activities can be verified against actual on-the-ground observations," said Herb Guenther, Director of the Arizona Department of Water Resources. Remarkably, garnering drought impact information from newspaper reports is the national method for reporting drought impacts, aside from a few well-observed parameters, such as streamflow and reservoir level.

The Arizona Department of Water Resources' Statewide Drought Program, in conjunction with Arizona Cooperative Extension and county emergency management, is convening Local Drought Impact Groups (LDIGs) in all counties across Arizona. Coordinated by local representatives, LDIGs are voluntary groups created to raise drought public awareness, provide impact information to local and state leaders, and initiate local mitigation and response measures.

As residents of the Southwest and northern Mexico have seen during the last ten years, drought can affect farms and ranches, forests and other vegetation, aquatic life and wildlife, and hydrology and water resources. Local monitoring of these types of impacts will be used for the LDIGs' drought planning and preparedness efforts. Moreover, local drought impact reports, provided to Arizona's Drought Monitoring Technical Committee (MTC), are used to improve the depiction of state and national drought status and verify drought monitoring and drought predictions. A brief summary of LDIG impact reports can be found in the monthly MTC drought status reports on the Statewide Drought Program website (http://www.azwater.gov/dwr/drought/MTC.html).

Professionals and ordinary citizens alike can support the LDIGs' efforts by providing monthly feedback on drought conditions throughout their county. The LDIGs and MTC seek regular observations (e.g., monthly or quarterly) of qualitative, information on:

- Agricultural conditions (such as crop damage or the need to develop supplemental water sources);
- Livestock production (such as the need to haul water, or increased mortality);
- Aquatic impacts (such as loss of fish due to decreased flows);
- Wildlife (such as drought-related habitat degredation or lack of food and drinking water);

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Roundup, continued

and management issues, impacts of urbanization, water markets, climate change, floodplain management, water quality and pollution, and many other issues. Nationally and internationally recognized experts will give plenary presentations. Technical talks and moderated discussions will feature academic researchers, business and industry experts, and agency scientists.

Fifty-second Annual New Mexico Water Conference—*Beyond the Year of Water: Living Within Our Water Limitations*
Date: November 29–30, 2007
Audience: Water resources and environmental professionals, researchers, and policy and decision makers
Location: La Fonda Hotel, 100 E. San Francisco Street, Santa Fe, NM
Website: http://wrri.nmsu.edu/conf/conf07/conf.html
Description: This conference features invited talks by state and federal government representatives, agency scientists, academic researchers, environmentalists, and others. The conference will cover a wide variety of timely topics, including Indian water rights settlements, demographic change and water demand, water resource economics, climate change, and legislative water issues. The conference is hosted by the Water Resources Research Institute of New Mexico State University.

Fire in the Southwest: Integrating Fire into Management of Changing Ecosystems
Date: January 28–31, 2008
Audience: Researchers; some sessions may be of interest to forest and land managers
Location: Holiday Inn Tucson Airport-North, 4550 South Palo Verde Boulevard, Tucson, AZ
Website: http://www.humboldt.edu/swfire/index.html
Description: This conference will provide a forum for the exchange of science information on the ecology and management of fire and adapted and affected ecosystems in the southwestern United States and northern Mexico. The opening plenary session will address "Southwest Ecosystems and Fire," and the closing plenary session will address "Implications of Climate Change for Future Fire Management." Other sessions will touch on fire and ecological restoration, fuel management and landscape decision processes, invasive plants and fire, fire behavior, societal issues and fire management implications, and lessons learned from large Southwest fires. The conference is hosted by the Association for Fire Ecology, in association with Humboldt State University.

National Association of Environmental Professionals 2008 Conference — *Changing Climates*
Date: March 25–28, 2008
Audience: Environmental professionals, resource managers and planners, and researchers; some sessions may be of interest to educators and policy and decision makers
Location: OMNI San Diego Hotel, 675 L Street, San Diego, CA
Website: http://www.naep.org/cde.cfm?event=158854.
Description: This conference features talks and discussions on a variety of environmental issues related to advancement of the environmental professions, environmental planning, research, and management. Presenters include professionals from industry, government, academia, and the private sector. Sessions will feature topics such as agriculture and the environment, environmental policy, land management, the National Environmental Policy Act (NEPA) and environmental regulations, energy, environmental education, health risk assessment, and water resources.

Gregg Garfin is the Deputy Director of Science Translation and Outreach at the Institute for the Study of Planet Earth at The University of Arizona.

AZ counties, continued

- Plants and vegetation (such as tree mortality, poor leaf condition, stress); and
- Water resources (such as deepening of wells or reduced flow from springs).

Submitting feedback online takes just a couple of minutes a month, and observations can be made while on the job or on a hike.

Arizona's online drought impacts reporting system (DIRS) can be accessed through the Arizona Flood Warning and Drought Monitoring website (http://data.afws.org/sui/DroughtImpacts.aspx). The DIRS is being revised to make it easier to use; the improved DIRS, expected to be completed by January 2008, will link Arizona information with the U.S. Drought Impact Reporter (http://droughtreporter.unl.edu/), which was developed by the National Drought Mitigation Center to collect, quantify, and map reported drought impacts nationally.

In addition to monitoring local impacts, LDIGs provide other opportunities for citizen participation, assist with education and outreach efforts, and recommend actions for drought mitigation and response. Arizona's LDIGs are a unique innovation in improving drought preparedness and monitoring, and they provide a great opportunity for citizens to participate in directing drought preparedness and education in their region.

For more information on LDIGs, please visit http://www.azwater.gov/dwr/drought/LDIG.html. To sign up for an LDIG, please contact your local Arizona Cooperative Extension agent (http://cals.arizona.edu/extension/directory/index.html).

Temperature (through 8/15/07)

Source: High Plains Regional Climate Center

For the water year that began October 1, 2006, temperatures in northwestern New Mexico are finally beginning to approach the thirty-year average (Figures 1a–b). Most of the state remains 1–3 degrees Fahrenheit below the average, as monsoon activity has held the temperatures down in the southern half of the state. In Arizona, the temperature pattern for the water year is unchanged from last month as the numerous cloudy days of the monsoon have kept the nighttime temperatures high and the daytime temperatures lower than average. Even with relatively high humidity, temperatures statewide were well above 100 degrees F and soared above 110 degrees F at many desert locations. The highest temperature—118 degrees—was recorded in Bullhead City.

Temperature patterns for the past thirty days were very different than they were for previous months (Figures 1c–d). Arizona has had temperatures ranging from 0–2 degrees above average in the north and along the western border, to 0–4 degrees below average in the southern half of the state. New Mexico has shown a similar warm north and cool south pattern. The north-south temperature gradient is likely due to the monsoonal moisture moving up from Mexico. The northern half of the state saw temperatures 0–6 degrees F above average; the southern half was 0–6 degrees F below average. A strong high pressure ridge hovered over the Arkansas-Mississippi border for an extended period, bringing hot, dry conditions to the Southeast, the Great Plains, and northern Arizona and New Mexico.

Notes:

The water year begins on October 1 and ends on September 30 of the following year. Water year is more commonly used in association with precipitation; water year temperature can be used to measure the temperatures associated with the hydrological activity during the water year.

Average refers to the arithmetic mean of annual data from 1971–2000. Departure from average temperature is calculated by subtracting current data from the average. The result can be positive or negative.

The continuous color maps (Figures 1a, 1b, 1c) are derived by taking measurements at individual meteorological stations and mathematically interpolating (estimating) values between known data points. The dots in Figure 1d show data values for individual stations. Interpolation procedures can cause aberrant values in data-sparse regions.

These are experimental products from the High Plains Regional Climate Center.

On the Web:

For these and other temperature maps, visit:
http://www.hprcc.unl.edu/maps/current/

For information on temperature and precipitation trends, visit:
http://www.cpc.ncep.noaa.gov/trndtext.shtml

Figure 1a. Water year '06–'07 (through August 15, 2007) average temperature.

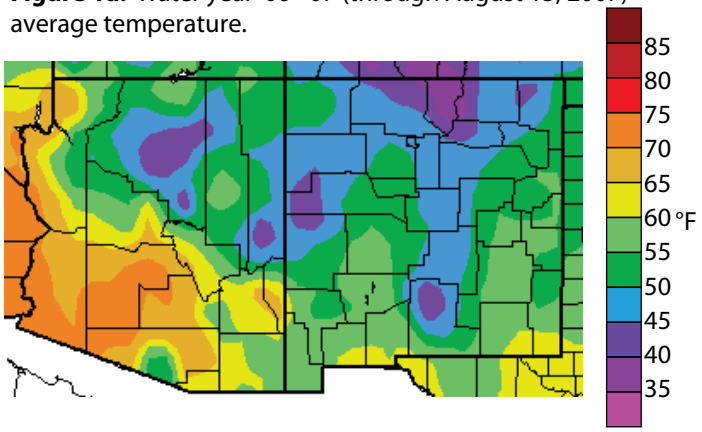


Figure 1b. Water year '06–'07 (through August 15, 2007) departure from average temperature.

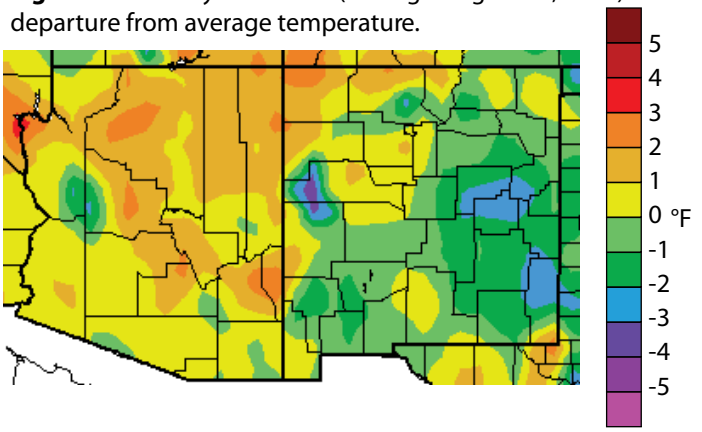


Figure 1c. Previous 30 days (July 17–August 15, 2007) departure from average temperature (interpolated).

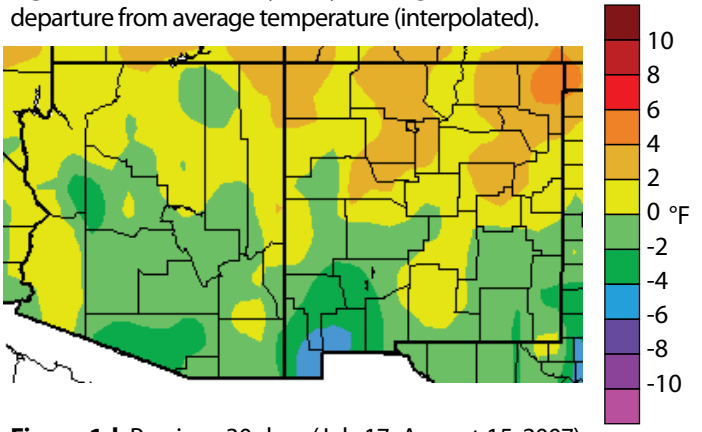
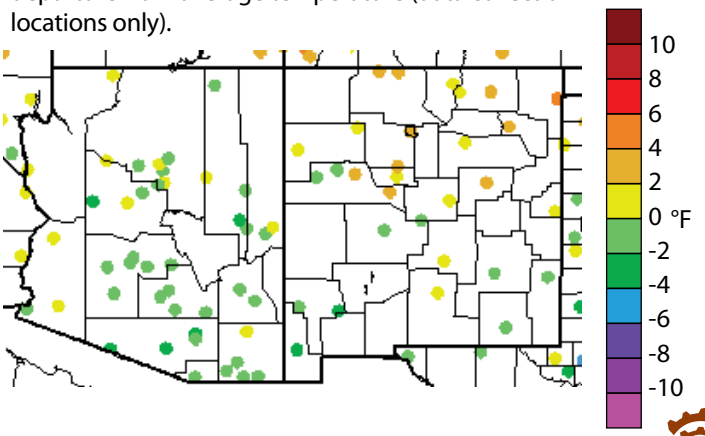


Figure 1d. Previous 30 days (July 17–August 15, 2007) departure from average temperature (data collection locations only).



Precipitation (through 8/15/07)

Source: High Plains Regional Climate Center

New Mexico's water year precipitation is still much above average for most of the state, but is only 70 percent of average in parts of the northeast, where summer rainfall has been 25 percent of average (Figures 2a–b). June was a wet month for most of New Mexico, but July and early August have been dry in the northern part of the state. In contrast, Arizona had a very dry June and early July, but is recovering somewhat along the eastern mountains. Unfortunately, even with water year precipitation moving up to 150 percent of average in the White Mountains, summer rainfall is not likely to increase reservoir levels, as the equivalent winter snowpack would do. Nevertheless, the past thirty days have brought nearly 400 percent of average summer rainfall to the higher elevations in Arizona (Figures 2c–d), and most of the state is near average for the monsoon (see Figures 9a–c). Rain has fallen somewhere in Arizona every day for the past thirty days, in many cases bringing more than 2 inches of rain per storm. The dry exception has been the lower Colorado River, which has had only one rain day in the past thirty days. Yuma has received only a trace of rain this summer. New Mexico has also seen rainfall every day, but the amounts are generally low, measuring 0.25 inches or less.

Figure 2a. Water year '06–'07 (through August 15, 2007) percent of average precipitation (interpolated).

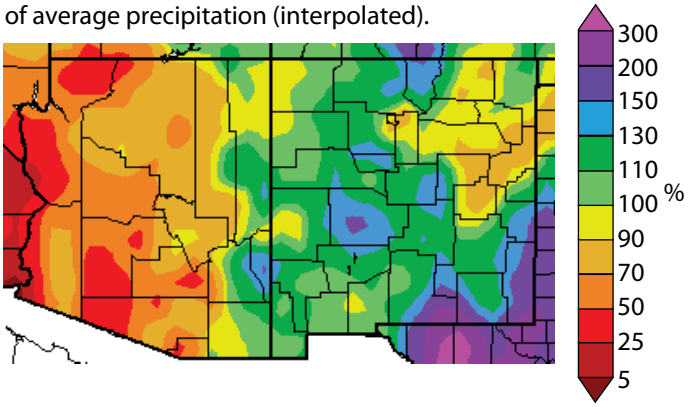


Figure 2b. Water year '06–'07 (through August 15, 2007) percent of average precipitation (data collection locations only).

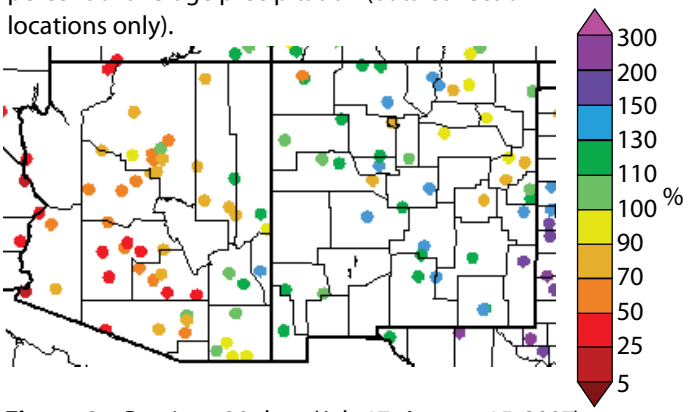


Figure 2c. Previous 30 days (July 17–August 15, 2007) percent of average precipitation (interpolated).

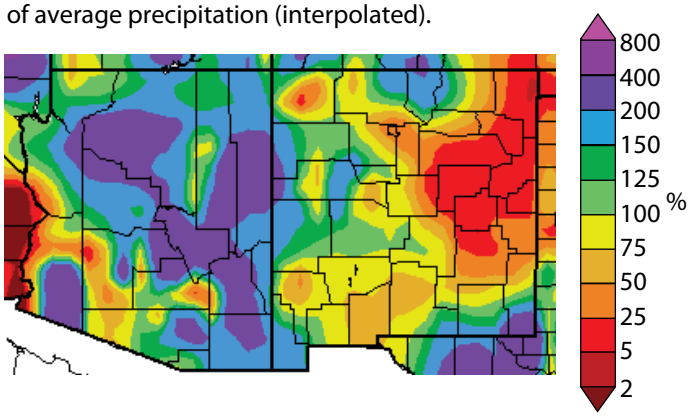
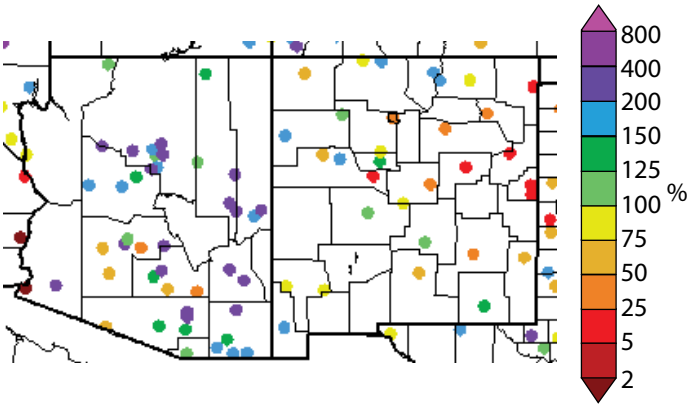


Figure 2d. Previous 30 days (July 17–August 15, 2007) percent of average precipitation (data collection locations only).



Notes:

The water year begins on October 1 and ends on September 30 of the following year. As of October 1, 2006, we are in the 2007 water year. The water year is a more hydrologically sound measure of climate and hydrological activity than is the standard calendar year.

Average refers to the arithmetic mean of annual data from 1971–2000. Percent of average precipitation is calculated by taking the ratio of current to average precipitation and multiplying by 100.

The continuous color maps (Figures 2a, 2c) are derived by taking measurements at individual meteorological stations and mathematically interpolating (estimating) values between known data points. Interpolation procedures can cause aberrant values in data-sparse regions.

The dots in Figures 2b and 2d show data values for individual meteorological stations.

On the Web:

For these and other precipitation maps, visit:
http://www.hprcc.unl.edu/maps/current/

For National Climatic Data Center monthly precipitation and drought reports for Arizona, New Mexico, and the Southwest region, visit: http://lwf.ncdc.noaa.gov/oa/climate/research/2003/perspectives.html#monthly

U.S. Drought Monitor
(released 8/16/07)

Sources: U.S. Department of Agriculture, National Drought Mitigation Center, National Oceanic and Atmospheric Administration

Only minor changes have been made to the current National Drought Monitor since last month (Figure 3). Summer rainfall has brought some improvements in drought conditions to parts of Arizona, while much of New Mexico remains drought free again this month. Drought conditions were downgraded one category from severe to moderate across a large portion of north-central Arizona. Southeast Arizona is now drought free with the removal of the abnormally dry designation. Even with short-term improvements, more than 96 percent of Arizona is still categorized under some level of drought. Much of western Arizona is still experiencing severe to extreme drought, representing more than 50 percent of the area of the state.

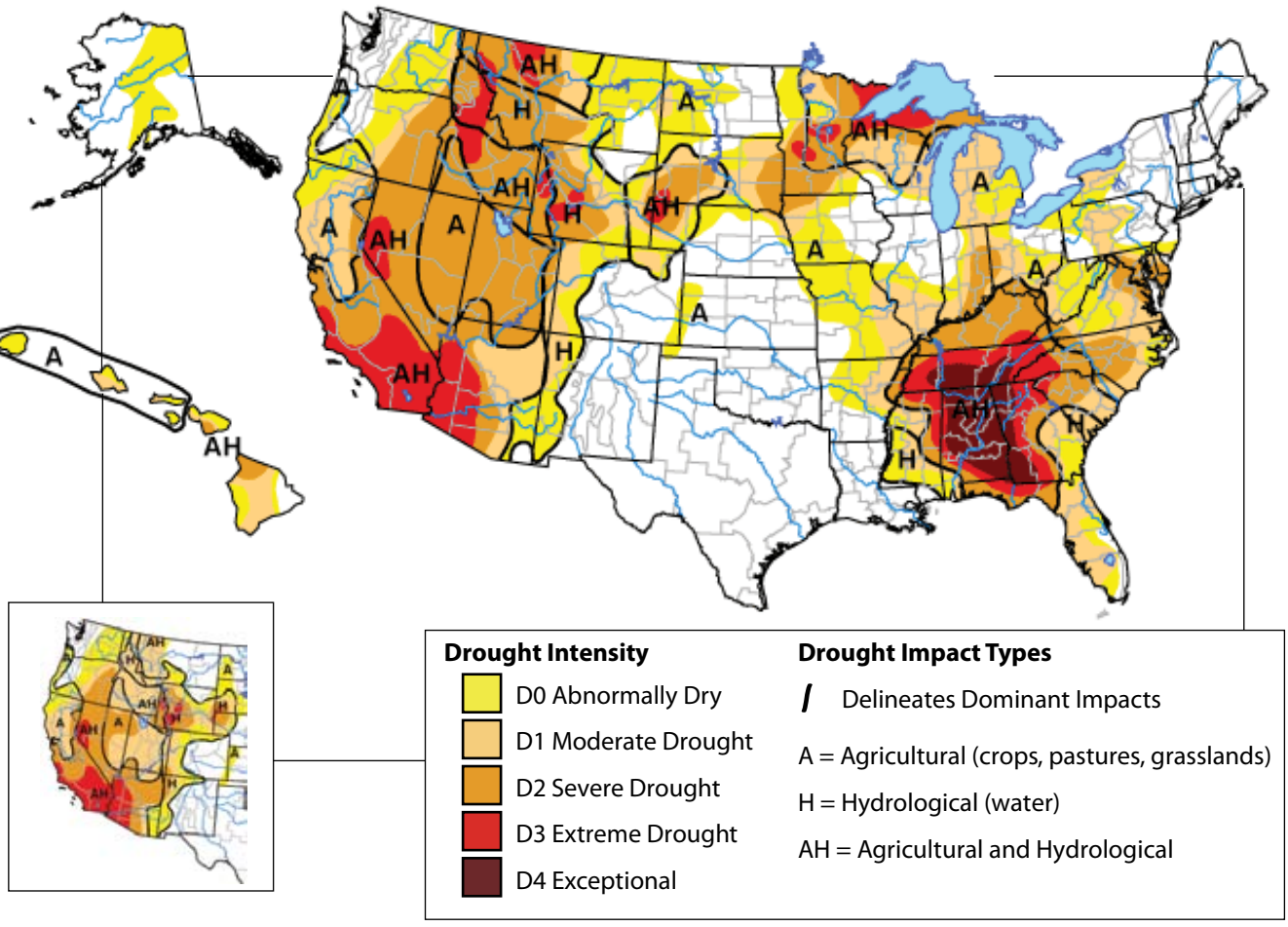
In New Mexico, only extreme western portions of the state are experiencing drought conditions. Abnormally dry conditions are present across 16 percent of the state; moderate drought conditions are present across 6 percent.

Notes:

The U.S. Drought Monitor is released weekly (every Thursday) and represents data collected through the previous Tuesday. The inset (lower left) shows the western United States from the previous month's map.

The U.S. Drought Monitor maps are based on expert assessment of variables including (but not limited to) the Palmer Drought Severity Index, soil moisture, streamflow, precipitation, and measures of vegetation stress, as well as reports of drought impacts. It is a joint effort of the several agencies; the author of this monitor is Brad Rippey, U. S. Department of Agriculture.

Figure 3. Drought Monitor released August 16, 2007 (full size) and July 19, 2007 (inset, lower left).



On the Web:

The best way to monitor drought trends is to pay a weekly visit to the U.S. Drought Monitor website: http://www.drought.unl.edu/dm/monitor.html

Arizona Drought Status
(through 6/30/07)

Source: Arizona Department of Water Resources

Arizona is still experiencing moderate to severe drought conditions across most of the state at short and long timescales (Figures 4a–b). There were no changes from June to July in the 2- to 4-year (long-term drought) window across Arizona (Figure 4b). Several watersheds in north and south central Arizona continue under the severe drought designation while the lower Colorado River and upper Gila watersheds show only abnormally dry conditions. Nevertheless, every watershed in Arizona is classified under some level of long-term drought. Short-term drought conditions have changed slightly from June to July in central portions of the state (Figure 4a). Below-average precipitation during last winter season, hot and dry spring conditions, and a sluggish start to the summer rainy season pulled the Bill Williams and Agua Fria watersheds down one category each, from severe to extreme and moderate to severe, respectively.

Figure 4a. Arizona short-term drought status for July 2007.

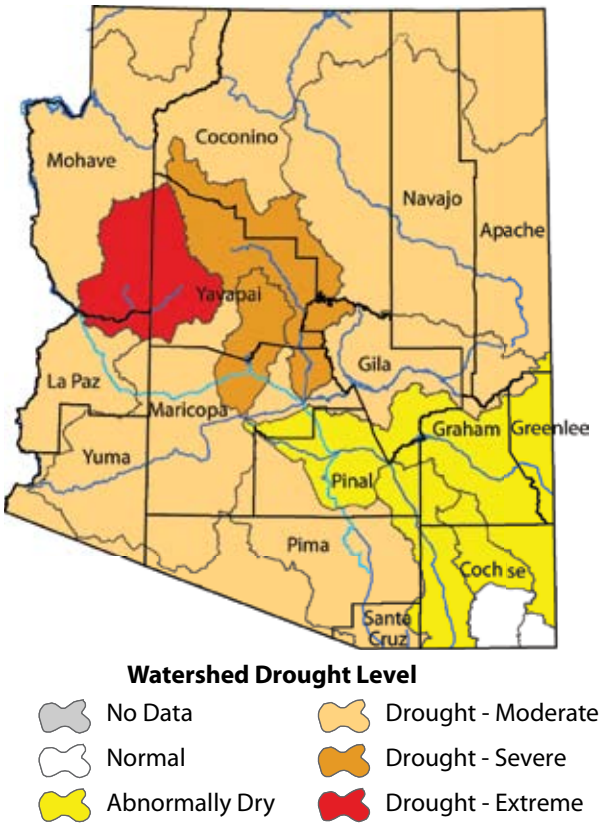
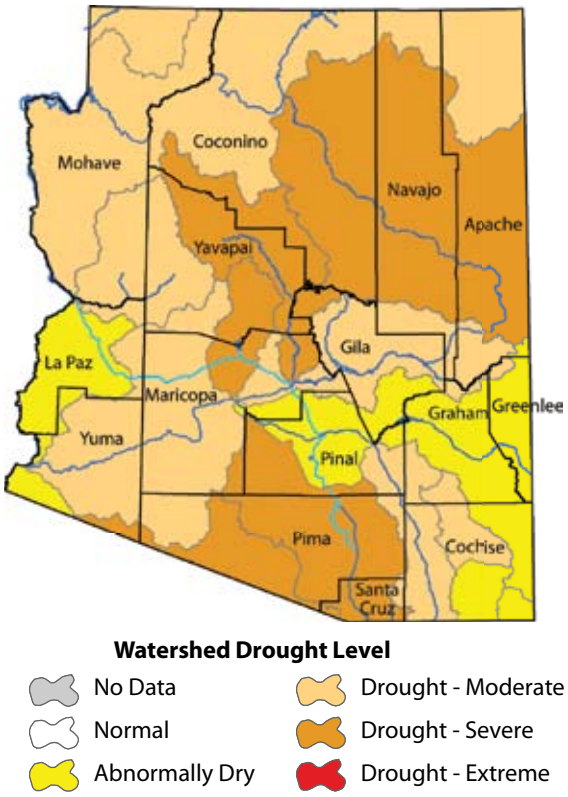


Figure 4b. Arizona long-term drought status for July 2007.



Notes:

The Arizona drought status maps are produced monthly by the Arizona Drought Preparedness Plan Monitoring Technical Committee. The maps are based on expert assessment of variables including, but not limited to, precipitation, drought indices, reservoir levels, and streamflow.

Figure 4a shows short-term or meteorological drought conditions. Meteorological drought is defined usually on the basis of the degree of dryness (in comparison to some "normal" or average amount) over a relatively short duration (e.g., months). Figure 4b refers to long-term drought, sometimes known as hydrological drought. Hydrological drought is associated with the effects of relatively long periods of precipitation shortfall (e.g., many months to years) on water supplies (i.e., streamflow, reservoir and lake levels, and groundwater). These maps are delineated by river basins (wavy gray lines) and counties (straight black lines).

On the Web:

For the most current Arizona drought status maps, visit: http://www.azwater.gov/dwr/Content/Hot_Topics/Agency-Wide/Drought_Planning/

New Mexico Drought Status

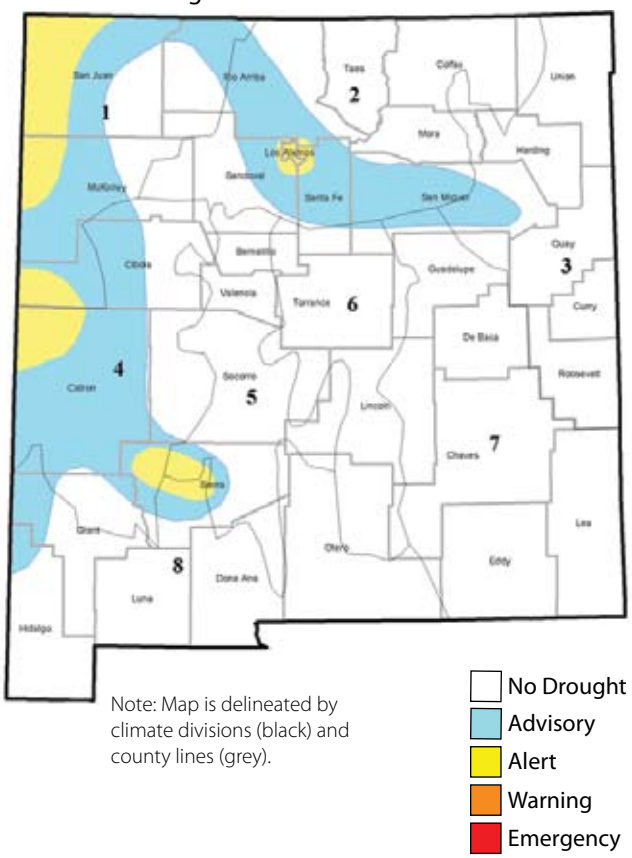
(through 8/31/07)

Source: New Mexico Natural Resources Conservation Service

The August 2007 update of the New Mexico drought status map shows some subtle changes from the last update in June 2007. The drought warning conditions present in June have eased to advisory and alert conditions in far western Cibola and McKinley counties in the northwestern part of the state (Figure 5). Overall, the same pattern of advisory and alert conditions continues across the extreme western counties and north central parts of the state and centered on the city of Los Alamos. Reports from the National Weather Service in Albuquerque indicate that rainfall has been near to above normal across western parts of the state, which has helped ease drought conditions slightly. Northeast and central counties have not been so lucky with summer rainfall. Reports of only 25–50 percent of average for the past sixty days are common through these areas. The northeast portion of the state is being monitored for the possible introduction of a drought advisory in coming months, according to the August drought status report.

A recent study by the New Mexico Department of Game and Fish found that populations of New Mexican meadow jumping mice have been falling—by up to two-thirds in some cases. Recent drought conditions may be a major factor in the rodents' decline (*The Washington Post*, July 25). The native mice are looked at as an important indicator of the health of riparian ecosystems across the state. Declining habitat in concert with lower streamflows appears to have stressed the meadow jumping mice population.

Figure 5. Short-term drought map based on meteorological conditions for August 2007.



Note: Map is delineated by climate divisions (black) and county lines (grey).

Notes:

The New Mexico drought status map is produced monthly by the New Mexico State Drought Monitoring Committee. When near-normal conditions exist, they are updated quarterly. The map is based on expert assessment of variables including, but not limited to, precipitation, drought indices, reservoir levels, and streamflow.

Figure 5 shows short-term or *meteorological* drought conditions. Meteorological drought is defined usually on the basis of the degree of dryness (in comparison to some "normal" or average amount) over a relatively short duration (e.g., months).

On the Web:

For the most current meteorological drought status map, visit:
http://www.srh.noaa.gov/abq/feature/droughtinfo.htm

For the most current hydrological drought status map, visit:
http://www.nm.nrcs.usda.gov/snow/drought/drought.html

Arizona Reservoir Levels

(through 7/31/07)

Source: National Water and Climate Center

Reservoir levels have changed slightly since June with half of the systems reporting losses (Figure 6). Lake Mead is at 48 percent of capacity, down slightly from 49 percent in June. Lake Powell showed a similar decline, falling from 53 percent in June to 51 percent in July. Reports from the Bureau of Reclamation note that inflow to Lake Powell was down to 5,000 cubic feet per second (cfs) in mid-July, but has recently jumped to 9,000 cfs due to monsoon thunderstorm activity in the watershed. The inflow to Lake Powell is only expected to be 51 percent of average for the water year, which ends September 30, and levels are expected to continue to decline through March 2008. Reservoirs across the rest of the state similarly show declines in levels from June to July. Percent of capacity on the Salt River System fell from 62 to 58 percent, and the San Carlos Reservoir saw a decline from 21 to 17 percent. The Verde River System stayed constant, with levels remaining at 26 percent of capacity.

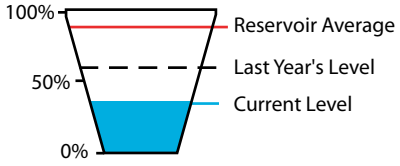
Notes:

The map gives a representation of current storage levels for reservoirs in Arizona. Reservoir locations are numbered within the blue circles on the map, corresponding to the reservoirs listed in the table. The cup next to each reservoir shows the current storage level (blue fill) as a percent of total capacity. Note that while the size of each cup varies with the size of the reservoir, these are representational and not to scale. Each cup also represents last year's storage level (dotted line) and the 1971–2000 reservoir average (red line).

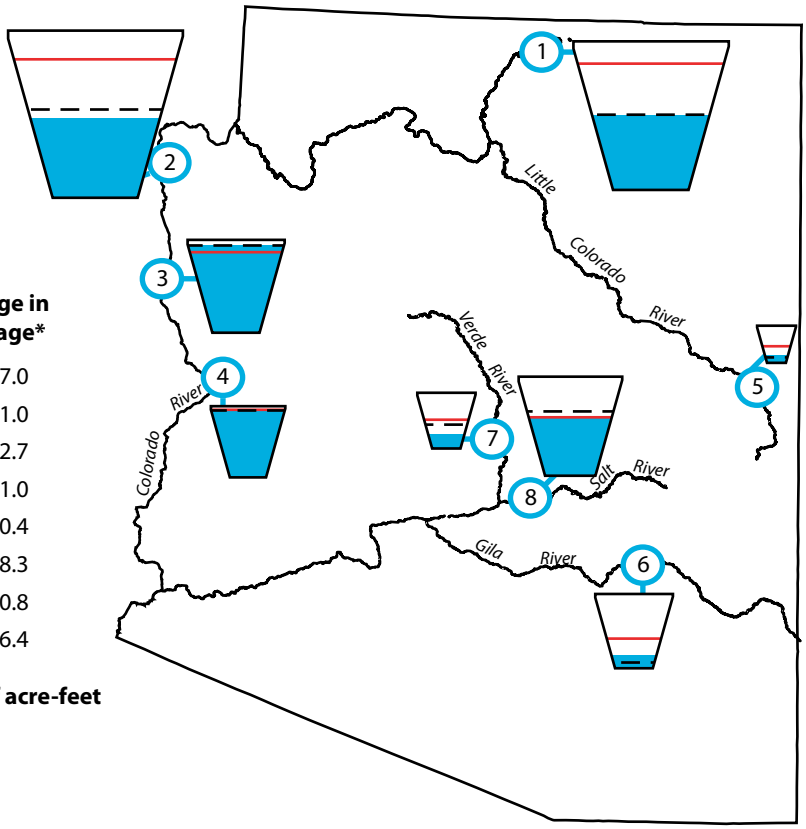
The table details more exactly the current capacity level (listed as a percent of maximum storage). Current and maximum storage levels are given in thousands of acre-feet for each reservoir. The last column of the table list an increase or decrease in storage since last month. A line indicates no change.

These data are based on reservoir reports updated monthly by the National Water and Climate Center of the U.S. Department of Agriculture's Natural Resource Conservation Service. For additional information, contact Tom Pagano at the National Water Climate Center (tom.pagano@por.usda.gov; 503-414-3010) or Larry Martinez, Natural Resource Conservation Service, 3003 N. Central Ave, Suite 800, Phoenix, Arizona 85012-2945; 602-280-8841; Larry.Martinez@az.usda.gov).

Figure 6. Arizona reservoir levels for July 2007 as a percent of capacity. The map also depicts the average level and last year's storage for each reservoir. The table also lists current and maximum storage levels, and change in storage since last month.



size of cups is representational of reservoir size, but not to scale



Reservoir Name	Capacity Level	Current Storage*	Max Storage*	Change in Storage*
1. Lake Powell	51%	12,465.0	24,322.0	-417.0
2. Lake Mead	48%	12,554.0	26,159.0	-181.0
3. Lake Mohave	94%	1,695.7	1,810.0	2.7
4. Lake Havasu	95%	586.8	619.0	1.0
5. Lyman Reservoir	21%	6.2	30.0	0.4
6. San Carlos	17%	144.8	875.0	-38.3
7. Verde River System	26%	75.9	287.4	0.8
8. Salt River System	58%	1,181.1	2,025.8	-76.4

*** thousands of acre-feet**

On the Web:

Portions of the information provided in this figure can be accessed at the NRCS website:
http://www.wcc.nrcs.usda.gov/wsf/reservoir/resv_rpt.html

New Mexico Reservoir Levels

(through 7/31/07)

Source: National Water and Climate Center

Reservoir levels across New Mexico have generally fallen slightly from June to July (Figure 7). Summer rainfall hasn't appeared to be doing much to slow the decline in reservoir levels in many watersheds. Overall storage in the Rio Grande Basin has fallen from 31 to 28 percent of total capacity. The largest decline in the Rio Grande Basin was at the Costilla Reservoir, which fell from 99 percent in June to 78 percent total capacity in July. Total storage on the Pecos River Basin also fell from 19 percent to 17 percent between June and July. The biggest loser in that basin was the Santa Rosa Reservoir, which fell from 20 percent in June to 15 percent in July. The Sumner Reservoir in the Pecos basin actually made a slight gain, from 21 percent to 25 percent.

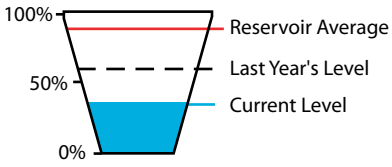
Notes:

The map gives a representation of current storage levels for reservoirs in New Mexico. Reservoir locations are numbered within the blue circles on the map, corresponding to the reservoirs listed in the table. The cup next to each reservoir shows the current storage level (blue fill) as a percent of total capacity. Note that while the size of each cup varies with the size of the reservoir, these are representational and not to scale. Each cup also represents last year's storage level (dotted line) and the 1971–2000 reservoir average (red line).

The table details more exactly the current capacity level (listed as a percent of maximum storage). Current and maximum storage levels are given in thousands of acre-feet for each reservoir. The last column of the table list an increase or decrease in storage since last month. A line indicates no change.

These data are based on reservoir reports updated monthly by the National Water and Climate Center of the U.S. Department of Agriculture's Natural Resource Conservation Service. For additional information, contact Tom Pagano at the National Water Climate Center (tom.pagano@por.usda.gov; 503-414-3010) or Dan Murray, NRCS, USDA, 6200 Jefferson NE, Albuquerque, NM 87109; 505-761-4436; Dan.Murray@nm.usda.gov).

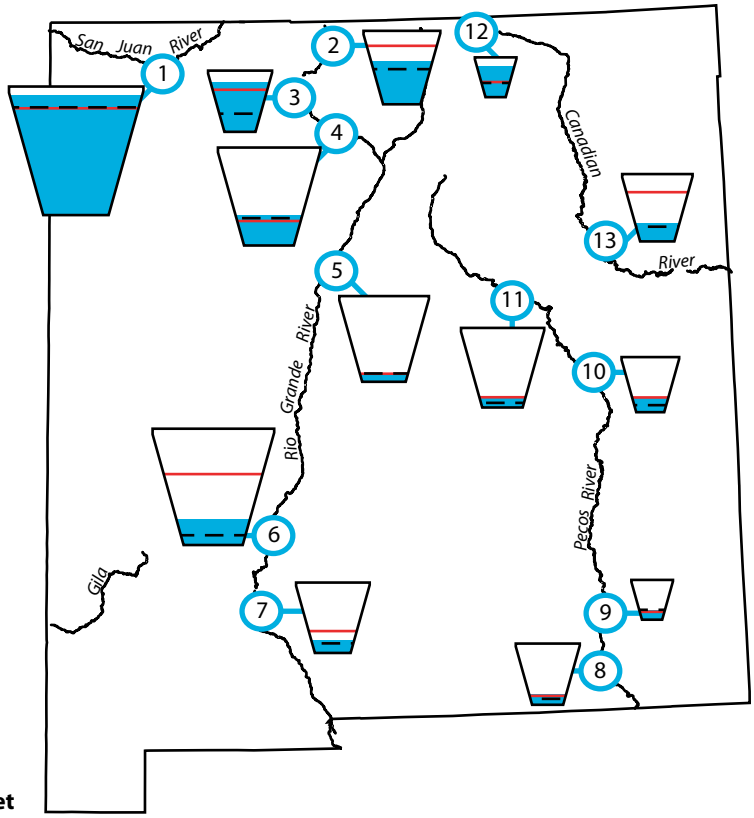
Figure 7. New Mexico reservoir levels for July 2007 as a percent of capacity. The map also depicts the average level and last year's storage for each reservoir. The table also lists current and maximum storage levels, and change in storage since last month.



size of cups is representational of reservoir size, but not to scale

Reservoir Name	Capacity Level	Current Storage*	Max Storage*	Change in Storage*
1. Navajo	93%	1,577.0	1,696.0	-2.0
2. Heron	59%	236.1	400.0	22.2
3. El Vado	81%	150.5	186.3	-29.1
4. Abiquiu	31%	173.8	554.5	-8.3
5. Cochiti	10%	50.9	502.3	-8.3
6. Elephant Butte	22%	464.0	2,065.0	-132.8
7. Caballo	18%	58.3	331.5	-17.6
8. Brantley	17%	24.7	147.5	-7.0
9. Lake Avalon	23%	1.4	6.0	0.4
10. Sumner	25%	25.2	102.0	0.6
11. Santa Rosa	15%	69.1	447.0	-21.2
12. Costilla	78%	12.5	16.0	-1.9
13. Conchas	28%	71.8	254.0	-15.7

*** thousands of acre-feet**



On the Web:

Portions of the information provided in this figure can be accessed at the NRCS website:
http://www.wcc.nrcs.usda.gov/wsf/reservoir/resv_rpt.html

Southwest Fire Summary
(updated 8/9/07)

Source: Southwest Coordination Center

There has been little fire activity in the Southwest since the mid-July onset of the summer monsoon. The number of fires and acres burned is well below average for the 2007 season (Figure 8a). Through August 9, year-to-date acres burned totalled 63,638 for Arizona and 36,727 for New Mexico. Large fuel moisture levels are well within the regional average, although national fire danger ratings are still considered high along the extreme southwest and northwest Arizona-California border and in the far northeast corner of New Mexico.

A combination of exceedingly high fire potential prior to the monsoon, combined with substantial monsoon moisture, has diminished conditions for prescribed fire; thus, prescribed fire acres burned are well below average for both New Mexico and Arizona.

The Southwest Geographic Area (Arizona, New Mexico, and west Texas) is at preparedness level 2 because other parts of the country are drawing upon resources from the Southwest during this lull in fire activity in the region. For a description of preparedness level 2, visit http://gacc.nifc.gov/swcc/predictive/intelligence/situation/preparedness/swa-pl2.html.

Figure 8a. Year-to-date fire information for Arizona and New Mexico as of August 9, 2007.

State	Human Caused Fires	Human caused acres	Lightning caused fires	Lightning caused acres	Total Fires	Total Acres
AZ	1,021	22,802	737	40,836	1,758	63,638
NM	442	25,205	505	11,522	947	36,727
Total	1,463	48,007	1,242	52,358	2,705	100,365

Figure 8b. Arizona large fire incidents as of August 1, 2007.

Figure 8c. New Mexico large fire incidents as of July 31, 2007.

Notes:

The fires discussed here have been reported by federal, state, or tribal agencies during 2007. The figures include information both for current fires and for fires that have been suppressed. Figure 8a shows a table of year-to-date fire information for Arizona and New Mexico. Prescribed burns are not included in these numbers. Figures 8b and 8c indicate the approximate locations of past and present "large" wildland fires and prescribed burns in Arizona and in New Mexico. A "large" fire is defined as a blaze covering 100 acres or more in timber or 300 acres or more in grass or brush. The name of each fire is provided next to the symbol.

On the Web:

These data are obtained from the Southwest Coordination Center website:

http://gacc.nifc.gov/swcc/predictive/intelligence/situation/swa_fire.htm
http://gacc.nifc.gov/swcc/predictive/intelligence/daily/ytd_large.htm

Monsoon Summary
(through 8/14/2007)

Source: Western Regional Climate Center

The 2007 monsoon season has brought copious rainfall to eastern and north-central Arizona, but surprisingly little rainfall to New Mexico (Figures 9a–b). Through August 14, monsoon precipitation totals were above average at most long-term National Weather Service Cooperative Observer sites in southeastern Arizona. Elsewhere in Arizona, many stations have logged 125 to more than 200 percent of average monsoon precipitation (Figure 9c). According to the National Climatic Data Center (NCDC), July was the twelfth wettest month in Arizona long-term climate records. New Mexico, in contrast, has received scant summer precipitation, except along its western and southern borders, and along its north central border. NCDC ranks July 2007 as the fiftieth driest July in New Mexico in the last 113 years.

In late July, powerful monsoon season thunderstorms, accompanied by strong winds, downed trees and power utility poles across Tucson, according to the National Weather Service. Rainfall on successive late July days saturated soils, and subsequent heavy downpours caused flooding that led to swift water rescues in several locations and two deaths at Sabino Canyon in Tucson. These floods sent water rushing down washes and tributaries into the Santa Cruz River. Scientists speculate that relatively little water from these spectacular summer downpours actually recharges the regional groundwater aquifer. Don Pool, a hydrologist with the U.S. Geological Survey, estimated that only 2 to 3 percent reaches the water table, 10 to 15 percent runs off, and the vast majority evaporates directly or through plants (*Tucson Citizen*, August 15).

Figure 9a. Total precipitation in inches July 1–August 14, 2007.

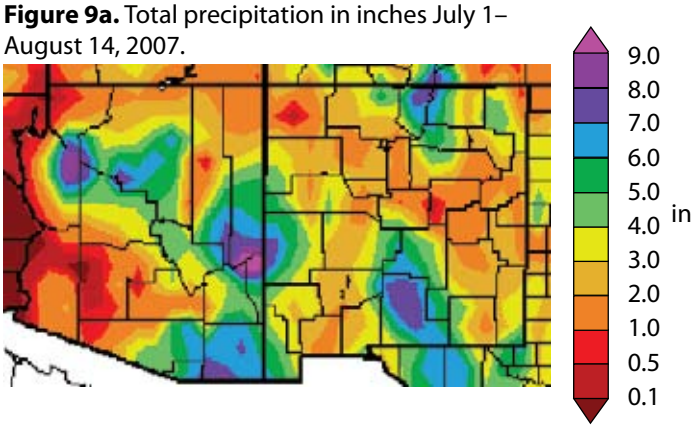


Figure 9b. Departure from average precipitation in inches July 1–August 14, 2007.

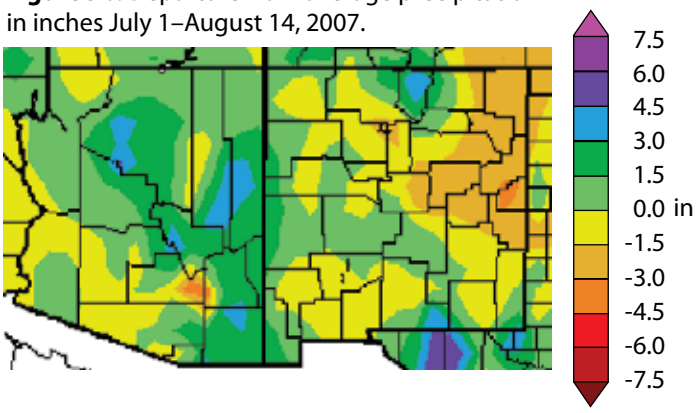
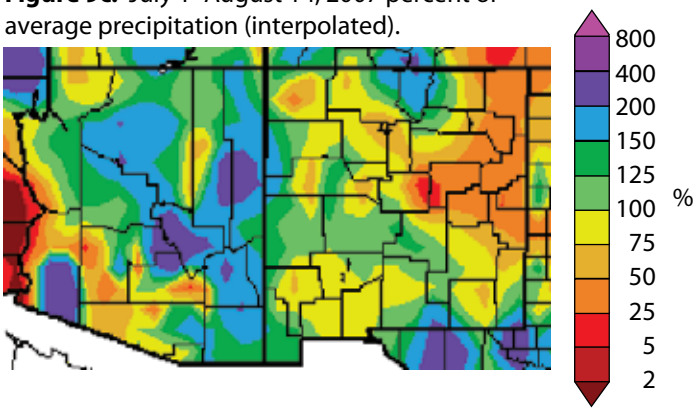


Figure 9c. July 1–August 14, 2007 percent of average precipitation (interpolated).



Notes:

Average refers to the arithmetic mean of annual data from 1971–2000. Percent of average precipitation is calculated by taking the ratio of current to average precipitation and multiplying by 100. Departure from average precipitation is calculated by subtracting the average from the current precipitation.

The continuous color maps (Figures 9a–c) are derived by taking measurements at individual meteorological stations and mathematically interpolating (estimating) values between known data points. Interpolation procedures can cause aberrant values in data-sparse regions. The data used to create these maps is provisional and have not yet been subjected to rigorous quality control.

On the Web:

These data are obtained from the Western Regional Climate Center: http://www.wrcc.dri.edu

Temperature Outlook
(September 2007–February 2008)

Source: NOAA Climate Prediction Center (CPC)

This month's NOAA-CPC long-lead temperature forecasts predict an increased likelihood of above-average temperatures across much of the country between September 2007 and February 2008 (Figures 10a–d). Only the West Coast and Pacific Northwest have equal chances of below-average, average, and above-average temperatures throughout this period. A heightened probability of unusually high temperatures is particularly apparent in the southwestern states. For all but the October–December forecast, a greater than 50 percent chance of above-average temperatures is forecast for most of Arizona and portions of New Mexico. According to Klaus Wolter, a climatologist at the NOAA-CIRES Climate Diagnostics Center, continued above-average temperatures in this region would be consistent with a long-term warming trend.

Notes:

These outlooks predict the likelihood (chance) of above-average, average, and below-average temperature, but not the magnitude of such variation. The numbers on the maps do not refer to degrees of temperature.

The NOAA-CPC outlooks are a 3-category forecast. As a starting point, the 1971–2000 climate record is divided into 3 categories, each with a 33.3 percent chance of occurring (i.e., equal chances, EC). The forecast indicates the likelihood of one of the extremes—above-average (A) or below-average (B)—with a corresponding adjustment to the other extreme category; the "average" category is preserved at 33.3 likelihood, unless the forecast is very strong.

Thus, using the NOAA-CPC temperature outlook, areas with light brown shading display a 33.3–39.9 percent chance of above-average, a 33.3 percent chance of average, and a 26.7–33.3 percent chance of below-average temperature. A shade darker brown indicates a 40.0–50.0 percent chance of above-average, a 33.3 percent chance of average, and a 16.7–26.6 percent chance of below-average temperature, and so on.

Equal Chances (EC) indicates areas where the reliability (i.e., 'skill') of the forecast is poor; areas labeled EC suggest an equal likelihood of above-average, average, and below-average conditions, as a "default option" when forecast skill is poor.

Figure 10a. Long-lead national temperature forecast for September–November 2007.

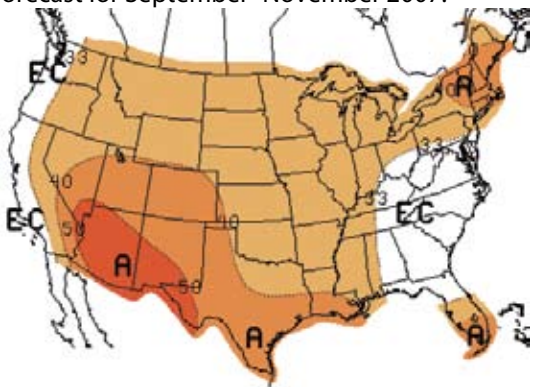


Figure 10b. Long-lead national temperature forecast for October–December 2007.

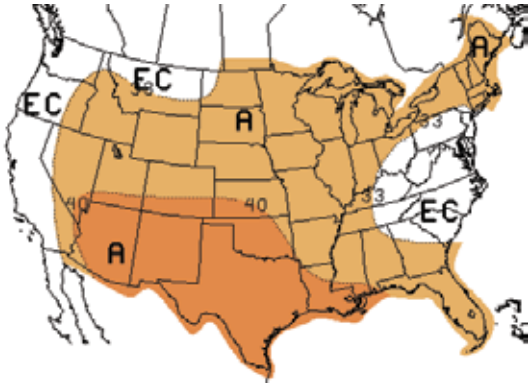


Figure 10c. Long-lead national temperature forecast for November 2007–January 2008.

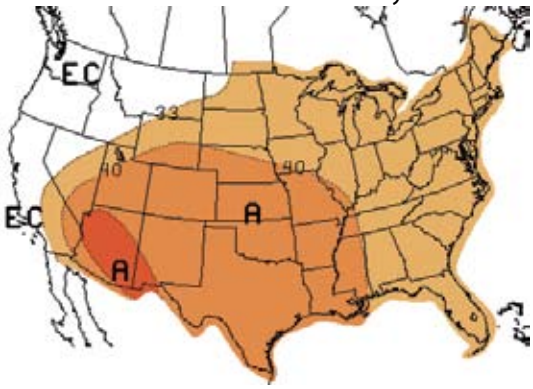
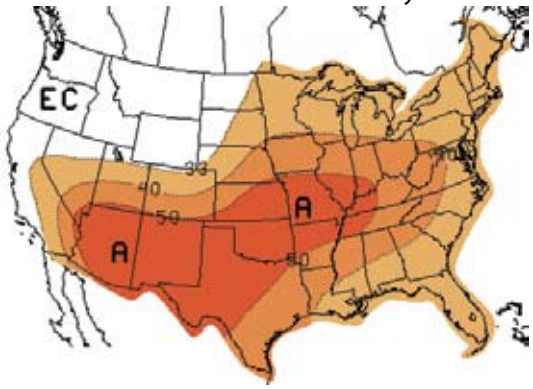


Figure 10d. Long-lead national temperature forecast for December 2007–February 2008.



A= Above
- 50.0–59.9%
- 40.0–49.9%
- 33.3–39.9%

EC= Equal chances. No forecasted anomalies.

On the Web:

For more information on CPC forecasts, visit:
http://www.cpc.ncep.noaa.gov/products/predictions/multi_season/13_seasonal_outlooks/color/churchill.html
(note that this website has many graphics and may load slowly on your computer)

For IRI forecasts, visit:
http://iri.columbia.edu/climate/forecast/net_asmt/

Precipitation Outlook
(September 2007–February 2008)

Source: NOAA Climate Prediction Center (CPC)

The NOAA-CPC forecasts for September 2007 through February 2008 generally predict an increased likelihood of below-average precipitation in the Southwest and above-average precipitation in the Pacific Northwest (Figures 11a–d). A dry winter in the southwestern states would be consistent with some recent predictions that ENSO conditions may shift from neutral to mild La Niña conditions later in the year (see Figure 14b), although the NOAA-CPC forecast also reflects long-term precipitation trends. The southeastern quarter of the country, which typically dries out during La Niña episodes, is also expected to have a greater probability of below-average rainfall through the November–February time period.

Notes:

These outlooks predict the likelihood (chance) of above-average, average, and below-average precipitation, but not the magnitude of such variation. The numbers on the maps do not refer to inches of precipitation.

The NOAA-CPC outlooks are a 3-category forecast. As a starting point, the 1971–2000 climate record is divided into 3 categories, each with a 33.3 percent chance of occurring (i.e., equal chances, EC). The forecast indicates the likelihood of one of the extremes—above-average (A) or below-average (B)—with a corresponding adjustment to the other extreme category; the "average" category is preserved at 33.3 likelihood, unless the forecast is very strong.

Thus, using the NOAA-CPC precipitation outlook, areas with light green shading display a 33.3–39.9 percent chance of above-average, a 33.3 percent chance of average, and a 26.7–33.3 percent chance of below-average precipitation. A shade darker green indicates a 40.0–50.0 percent chance of above-average, a 33.3 percent chance of average, and a 16.7–26.6 percent chance of below-average precipitation, and so on.

Equal Chances (EC) indicates areas where the reliability (i.e., 'skill') of the forecast is poor; areas labeled EC suggest an equal likelihood of above-average, average, and below-average conditions, as a "default option" when forecast skill is poor.

Figure 11a. Long-lead national precipitation forecast for September–November 2007.

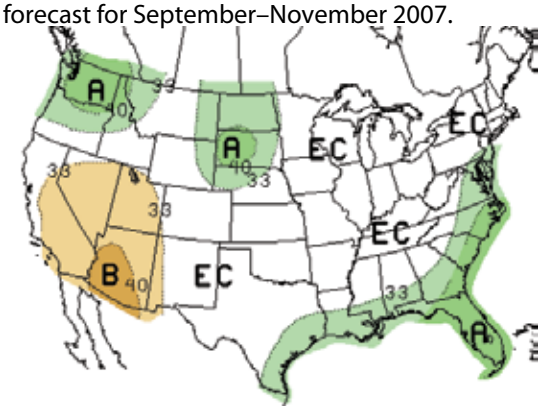


Figure 11b. Long-lead national precipitation forecast for October–December 2007.

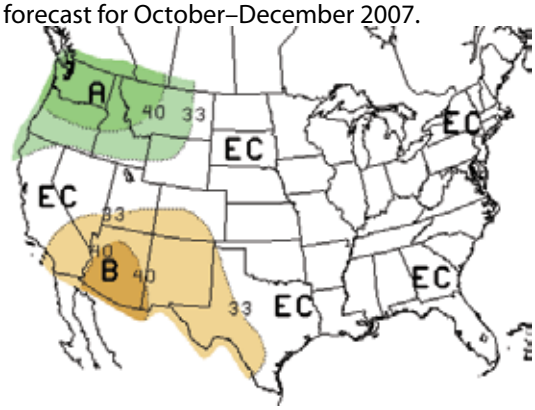


Figure 11c. Long-lead national precipitation forecast for November 2007–January 2008.

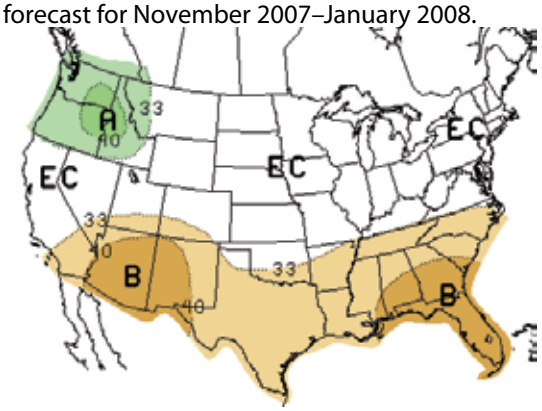
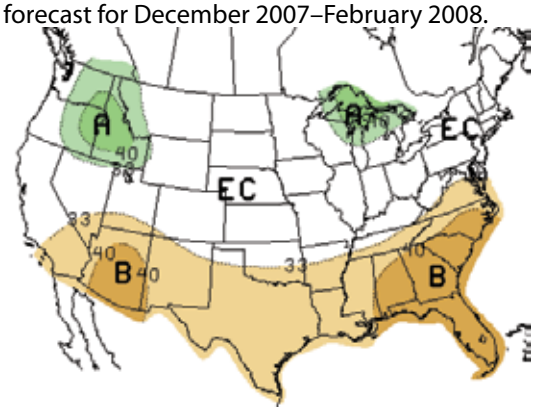


Figure 11d. Long-lead national precipitation forecast for December 2007–February 2008.



A= Above
- 40.0–49.9%
- 33.3–39.9%

B= Below
- 33.3–39.9%
- 40.0–49.9%

EC= Equal chances. No forecasted anomalies.

On the Web:

For more information on CPC forecasts, visit:
http://www.cpc.ncep.noaa.gov/products/predictions/multi_season/13_seasonal_outlooks/color/churchill.html
(note that this website has many graphics and may load slowly on your computer)

For IRI forecasts, visit:
http://iri.columbia.edu/climate/forecast/net_asmt/

Seasonal Drought Outlook
(through November 2007)

Source: NOAA Climate Prediction Center (CPC)

The NOAA-CPC U.S. Seasonal Drought Outlook projects decreased drought conditions throughout much of Arizona (Figure 12). Lack of drought characterizes most of New Mexico, thus the drought outlook only covers the northwestern corner of New Mexico, where drought conditions are expected to ameliorate. Persistent or intensifying drought conditions are expected along Arizona's western third (chiefly, Yuma, La Paz, and Mohave counties) into the western Great Basin and California.

Warmer-than-average temperatures and low winter precipitation totals have kept drought potential high for western Arizona. Forecasts show increased chances of above-average temperatures (see Figures 11a–d) and above-average precipitation (see Figures 12a–d) in this region through the fall and into the winter. Nevertheless, the Southwest Coordination Center does not expect significant fire concerns for western Arizona.

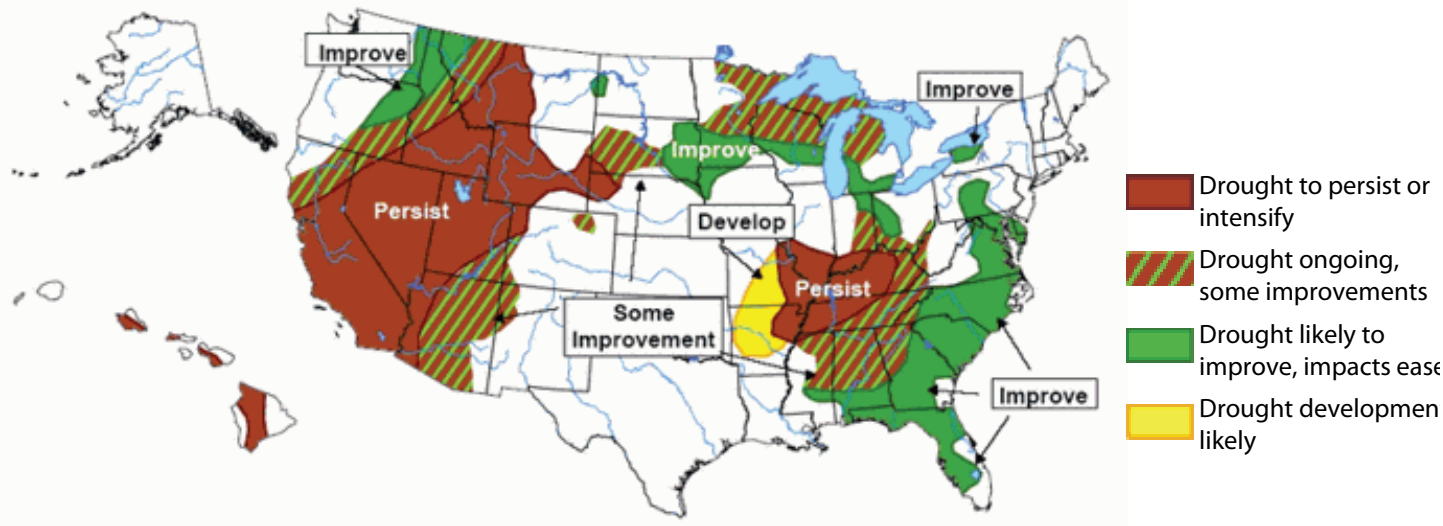
In drought-related news, the United States and Mexico have called for further discussions on drought, climate change, and Colorado River streamflows (*The Arizona Republic*, August 15). Discussions are expected to include the U.S. Bureau of Reclamation and the International Boundary and Water Commission, which administers treaties regarding the river. These talks are especially important to Arizona, which would lose the most water in the event that a sustained severe drought affects Colorado River streamflow. Representatives to the talks are also expected to discuss possibilities for augmenting water supplies through desalinating ocean water from the Gulf of California. These topics are high on the list of priorities for the Arizona-Mexico Commission's (AMC) new water committee. For more information about the AMC see http://www.azmc.org/.

On August 17, officials dedicated the new Brackish Groundwater National Desalination Research Facility in Alamogordo, New Mexico (*Alamogordo Daily News*, August 15). The facility, which will bring together researchers from federal agencies, universities, the private sector, and state and local agencies, is the only inland research facility of its kind.

Notes:

The delineated areas in the Seasonal Drought Outlook (Figure 12) are defined subjectively and are based on expert assessment of numerous indicators, including outputs of short- and long-term forecasting models.

Figure 12. Seasonal drought outlook through November 2007 (released August 16, 2007).



On the Web:

For more information, visit:
http://www.drought.noaa.gov/

Wildland Fire Outlook

Sources: National Interagency Coordination Center, Southwest Coordination Center

The monthly fire potential outlook from the National Interagency Coordination Center shows normal fire potential for Arizona and New Mexico during August (Figure 13a) and into the fall (not shown). The Southwest Coordination Center (SWCC) in Albuquerque does not anticipate any significant fire concerns, even during warm and dry periods, for the rest of the summer. The outlook is based on fuel conditions, which are moister than last month and within regional averages for this time of year (Figure 13b), as well as substantial recent precipitation in the western half of the area and no expectation of below-average precipitation during August.

According to the SWCC's latest monthly outlook, August 2007 will require relatively few firefighting resources, which is usually the case during the month. Arizona, New Mexico, and west Texas average 10 fires greater than 100 acres in August.

Most of the nation's large fire activity moved to the northern Great Basin and northern Rocky Mountains during July and early August. As of August 16, dozens of fires greater than 10,000 acres were burning in northern Utah, throughout Idaho and Montana, and in eastern Oregon and eastern Washington.

Figure 13a. National wildland fire potential for fires greater than 100 acres (valid August 1–31, 2007).

Figure 13b. Current fine fuel condition and live fuel moisture status in the Southwest.

Current Fine Fuels						
Grass Stage	Green	X	Cured			
New Growth	Sparse		Normal	X	Above Normal	X

Live Fuel Moisture	
	Percent of Average
Arizona	
Douglas Fir	114
Juniper	n/a
Piñon	n/a
Ponderosa Pine	103
Sagebrush	n/a
New Mexico	
Douglas Fir	114
Juniper	89
Piñon	123
Ponderosa Pine	114
Sagebrush	117
1,000-hour dead fuel moisture — AZ	**8.5**
1,000-hour dead fuel moisture — NM	**11.5**
Average 1000-hour fuel moisture for this time of year	**10–15**

Notes:

The National Interagency Coordination Center at the National Interagency Fire Center produces monthly wildland fire outlooks. The forecasts (Figure 13a) consider climate forecasts and surface-fuels conditions in order to assess fire potential for fires greater than 100 acres. They are subjective assessments, based on synthesis of regional fire danger outlooks.

The Southwest Area Wildland Fire Operations produces monthly fuel conditions and outlooks. Fuels are any live or dead vegetation that are capable of burning during a fire. Fuels are assigned rates for the length of time necessary to dry. Small, thin vegetation, such as grasses and weeds, are 1-hour and 10-hour fuels , while 1000-hour fuels are large-diameter trees. The top portion of Figure 13b indicates the current condition and amount of growth of fine (small) fuels. The lower section of the figure shows the moisture level of various live fuels as percent of average conditions.

On the Web:

National Wildland Fire Outlook web page:
http://www.nifc.gov/news/nicc.html

Southwest Coordination Center web page:
http://gacc.nifc.gov/swcc/predictive/outlooks/monthly/swa_monthly.htm

El Niño Status and Forecast

Sources: NOAA Climate Prediction Center (CPC), International Research Institute for Climate and Society (IRI)

Sea surface temperatures (SSTs) fell slightly across the eastern equatorial Pacific Ocean from July to August, signifying a continued march towards La Niña conditions (Figure 14a). The rapid shift from weak El Niño to neutral conditions last winter prompted forecasters to watch for a further quick transition to La Niña conditions this past spring. That transition has dragged on for several months, however, as SSTs and atmospheric circulation patterns sent mixed signals as to whether cold event (La Niña) conditions would fully evolve. The signals from the Pacific are much clearer this month and models are picking up on this clarity. The NOAA Climate Prediction Center (CPC) reports that upper ocean heat content has decreased, limited thunderstorm activity has occurred over the east Pacific, and the easterly winds at the equator have strengthened over the past several weeks. All of these signs point to an environment favoring the development of La Niña conditions. The International Research Institute for Climate and Society (IRI) notes that current eastern Pacific SSTs (-0.5 to -0.6) are very close to qualifying as official La Niña conditions.

Notes:

Figure 14a shows the standardized three month running average values of the Southern Oscillation Index (SOI) from January 1980 through July 2007. The SOI measures the atmospheric response to SST changes across the Pacific Ocean Basin. The SOI is strongly associated with climate effects in the Southwest. Values greater than 0.5 represent La Niña conditions, which are frequently associated with dry winters and sometimes with wet summers. Values less than -0.5 represent El Niño conditions, which are often associated with wet winters.

Figure 14b shows the International Research Institute for Climate Prediction (IRI) probabilistic El Niño-Southern Oscillation (ENSO) forecast for overlapping three month seasons. The forecast expresses the probabilities (chances) of the occurrence of three ocean conditions in the ENSO-sensitive Niño 3.4 region, as follows: El Niño, defined as the warmest 25 percent of Niño 3.4 sea-surface temperatures (SSTs) during the three month period in question; La Niña conditions, the coolest 25 percent of Niño 3.4 SSTs; and neutral conditions where SSTs fall within the remaining 50 percent of observations. The IRI probabilistic ENSO forecast is a subjective assessment of current model forecasts of Niño 3.4 SSTs that are made monthly. The forecast takes into account the indications of the individual forecast models (including expert knowledge of model skill), an average of the models, and other factors.

On the Web:

For a technical discussion of current El Niño conditions, visit: http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/

For more information about El Niño and to access graphics similar to the figures on this page, visit: http://iri.columbia.edu/climate/ENSO/

Both statistical and dynamical models are starting to reach consensus in pointing towards the development of a weak La Niña event through this fall (Figure 14b). Model analyses from the IRI predict a 50 to 60 percent chance of La Niña conditions developing through November in contrast to a 40 percent chance of conditions remaining neutral. Both IRI and CPC note that the chances of an El Niño event developing are remote, at less than 3 percent. Fall and winter precipitation forecasts for the Southwest by both CPC and IRI reflect the predicted shift towards cool eastern Pacific Ocean temperatures. In Arizona and New Mexico, La Niña typically brings below-average winter precipitation, which is forecasted for the region this fall and through the winter (see Figures 11a–d).

Figure 14a. The standardized values of the Southern Oscillation Index from January 1980–July 2007. La Niña/El Niño occurs when values are greater than 0.5 (blue) or less than -0.5 (red) respectively. Values between these thresholds are relatively neutral (green).

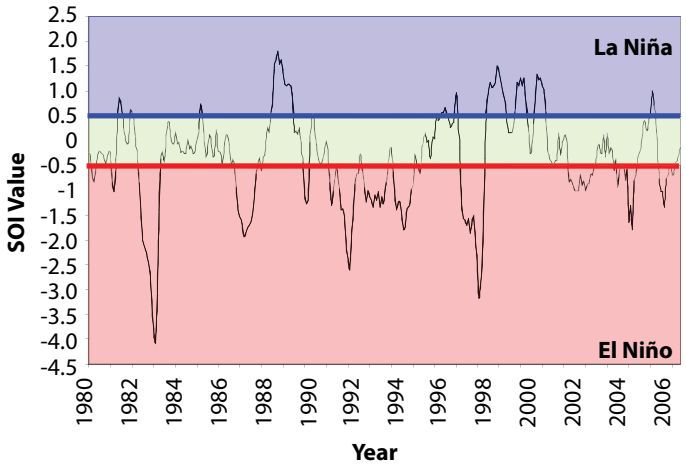
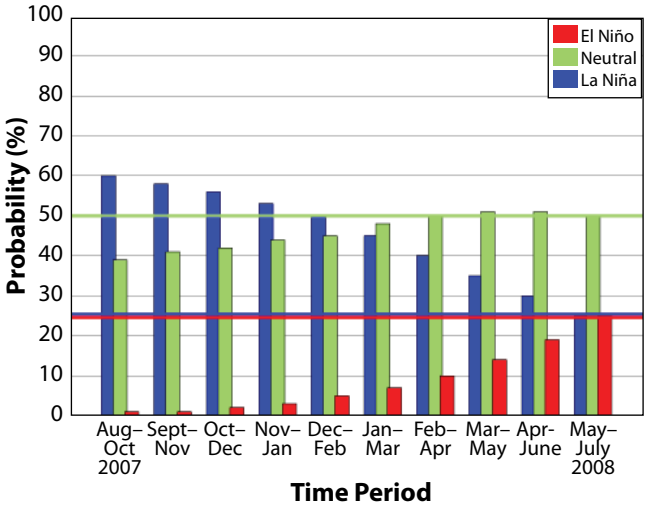


Figure 14b. IRI probabilistic ENSO forecast for El Niño 3.4 monitoring region (released August 16, 2007). Colored lines represent average historical probability of El Niño, La Niña, and neutral.

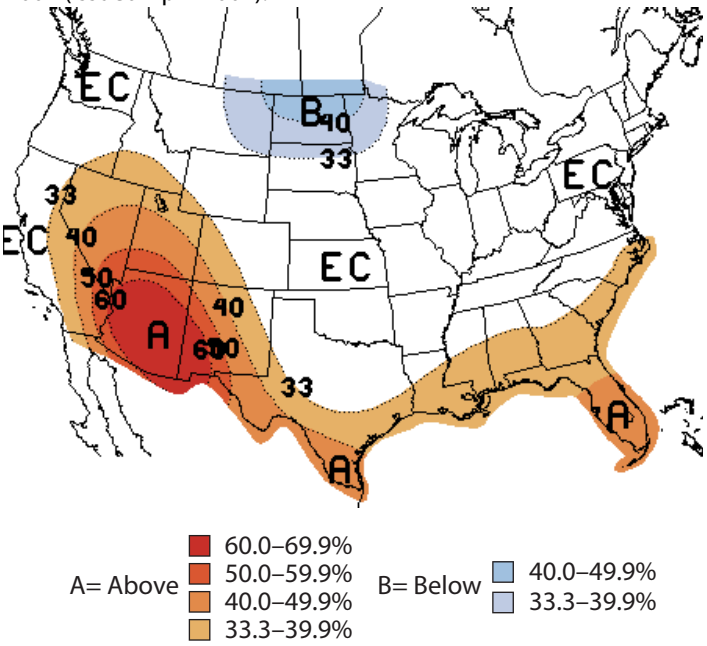


Temperature Verification
(May–July 2007)

Source: NOAA Climate Prediction Center (CPC)

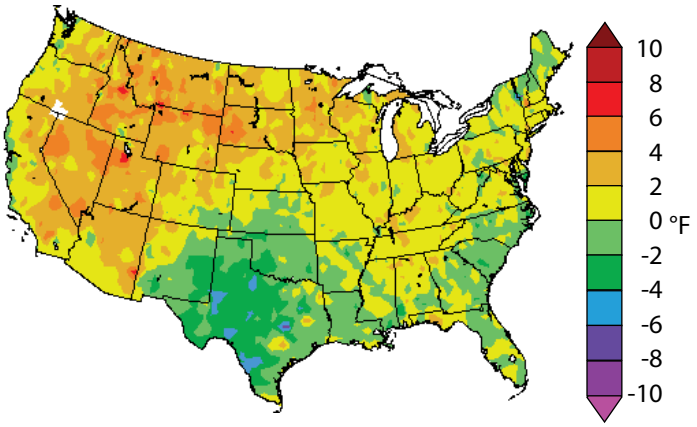
The NOAA-CPC seasonal temperature outlook for May–July predicted an increased likelihood of above-average temperatures throughout the southwestern states and the Gulf Coast and equal chances of below-average, average, or above-average temperatures across most of the rest of the nation (Figure 15a). Observed conditions were not markedly different than forecast conditions in the Southwest, where temperatures were at or slightly above normal (generally by 0 to 4 degrees F) in Arizona and the western part of New Mexico and across most of the northern and western third of the country (Figure 15b). Texas was unexpectedly cooler than normal; most of the state experienced temperatures that were 0–6 degrees F below the long-term average. Low temperatures accompanied extremely high precipitation during the same period (see Figure 16b). Central and eastern New Mexico also continued a long trend of slightly below-average temperatures.

Figure 15a. Long-lead U.S. temperature forecast for May–July 2007 (issued April 2007).



EC= Equal chances. No forecasted anomalies.

Figure 15b. Average temperature departure (in degrees F) for May–July 2007.



Notes:

Figure 15a shows the NOAA Climate Prediction Center (CPC) temperature outlook for the months May–July 2007. This forecast was made in April 2007.

The outlook predicts the likelihood (chance) of above-average, average, and below-average temperature, but not the magnitude of such variation. The numbers on the maps do not refer to degrees of temperature.

Using past climate as a guide to average conditions and dividing the past record into 3 categories, there is a 33.3 percent chance of above-average, a 33.3 percent chance of average, and a 33.3 percent chance of below-average temperature. Thus, using the NOAA CPC likelihood forecast, in areas with light brown shading there is a 33.3–39.9 percent chance of above-average, a 33.3 percent chance of average, and a 26.7–33.3 percent chance of below-average precipitation. Equal Chances (EC) indicates areas where reliability (i.e., the skill) of the forecast is poor and no prediction is offered.

Figure 15b shows the observed departure of temperature (degrees F) from the average for the May–July 2007 period. Care should be exercised when comparing the forecast (probability) map with the observed temperature maps. The temperature departures do not represent probability classes as in the forecast maps, so they are not strictly comparable. They do provide us with some idea of how well the forecast performed. In all of the figures on this page, the term average refers to the 1971–2000 average. This practice is standard in the field of climatology.

On the Web:

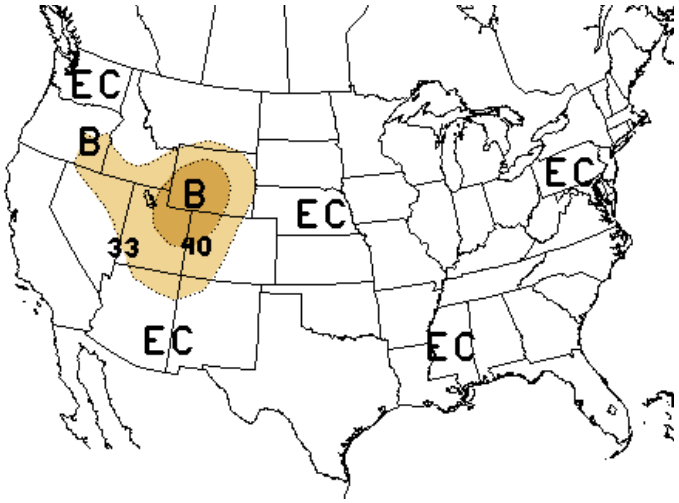
For more information on CPC forecasts, visit:
http://www.cpc.ncep.noaa.gov/products/predictions/multi_season/13_seasonal_outlooks/color/churchill.html

Precipitation Verification
(May–July 2007)

Source: NOAA Climate Prediction Center (CPC)

The NOAA-CPC seasonal precipitation outlook for May–July indicated an increased probability of below-average precipitation in the Great Basin region and equal chances of below-average, average, and above-average precipitation for the rest of the country (Figure 16a). In Arizona and New Mexico, the story was somewhat mixed. Most areas experienced near-normal precipitation, but some localized areas saw less than 50 percent of normal precipitation while others received more than 300 percent. Observed precipitation was in fact well below average throughout most of the Great Basin (from less than 5 percent of normal in some areas to near normal in others), but the most extreme precipitation shortages were in central and southern California, extending into western Nevada. In the southern two-thirds of California, most areas saw less than 5 percent of normal precipitation and nearly all received less than 25 percent of normal (Figure 16b). Conversely, precipitation for this period was well above normal for the central and southern Plains, and Texas storms led to severe flooding.

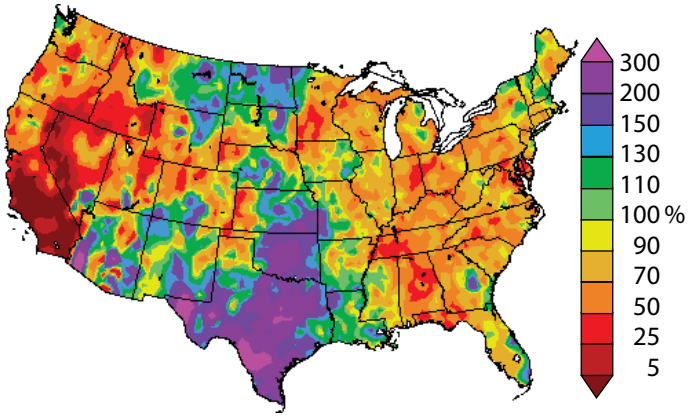
Figure 16a. Long-lead U.S. precipitation forecast for May–July 2007 (issued April 2007).



B= Below 40.0–49.9%
33.3–39.9%

EC= Equal chances. No forecasted anomalies.

Figure 16b. Percent of average precipitation observed from May–July 2007.



Notes:

Figure 16a shows the NOAA Climate Prediction Center (CPC) precipitation outlook for the months May–July 2007. This forecast was made in April 2007.

The outlook predicts the likelihood (chance) of above-average, average, and below-average precipitation, but not the magnitude of such variation. The numbers on the maps do not refer to inches of precipitation. Using past climate as a guide to average conditions and dividing the past record into 3 categories, there is a 33.3 percent chance of above-average, a 33.3 percent chance of average, and a 33.3 percent chance of below-average precipitation. Thus, using the NOAA CPC likelihood forecast, in areas with light brown shading there is a 33.3–39.9 percent chance of above-average, a 33.3 percent chance of average, and a 26.7–33.3 percent chance of below-average precipitation. Equal Chances (EC) indicates areas where reliability (i.e., the skill) of the forecast is poor and no prediction is offered.

Figure 16b shows the observed percent of average precipitation for May–July 2007. Care should be exercised when comparing the forecast (probability) map with the observed precipitation maps. The observed precipitation amounts do not represent probability classes as in the forecast maps, so they are not strictly comparable, but they do provide us with some idea of how well the forecast performed.

In all of the figures on this page, the term average refers to the 1971–2000 average. This practice is standard in the field of climatology.

On the Web:

For more information on CPC forecasts, visit:
http://www.cpc.ncep.noaa.gov/products/predictions/multi_season/13_seasonal_outlooks/color/churchill.html