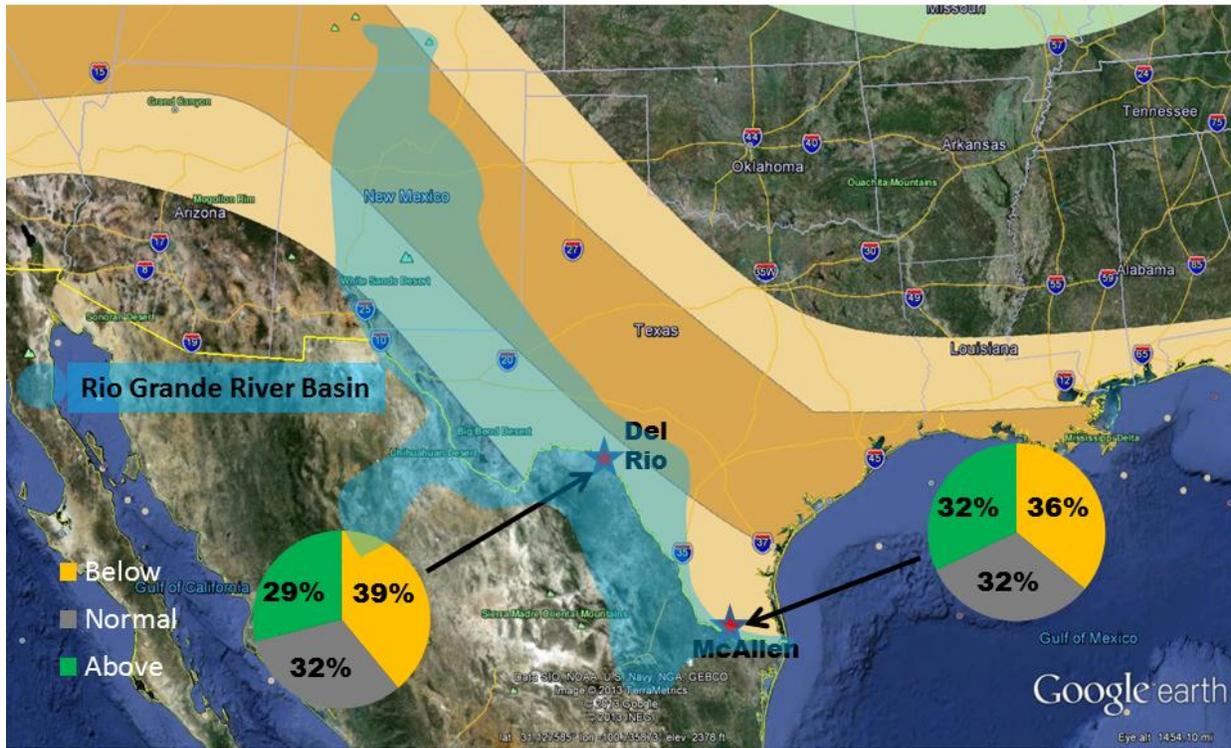


April-June 2013 Rainfall Forecast



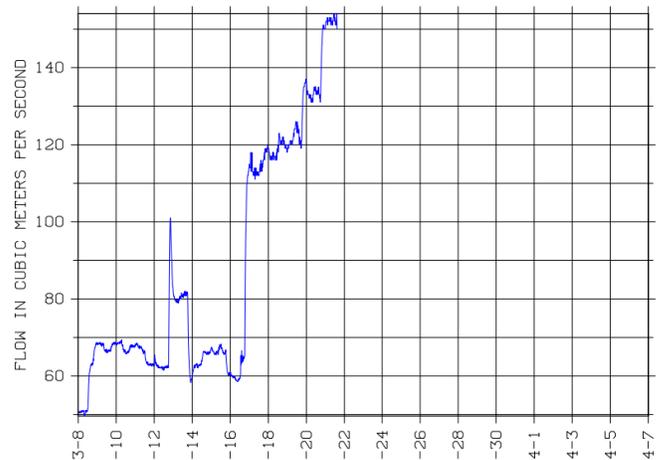
Note: Values described in pie charts above, and for the temperature departure chart on page 2, were estimated from the graphic; actual data points were not available at the time of this writing.

It Just Gets Worse No Rest For Drought-Weary RGV as Spring heads for Summer

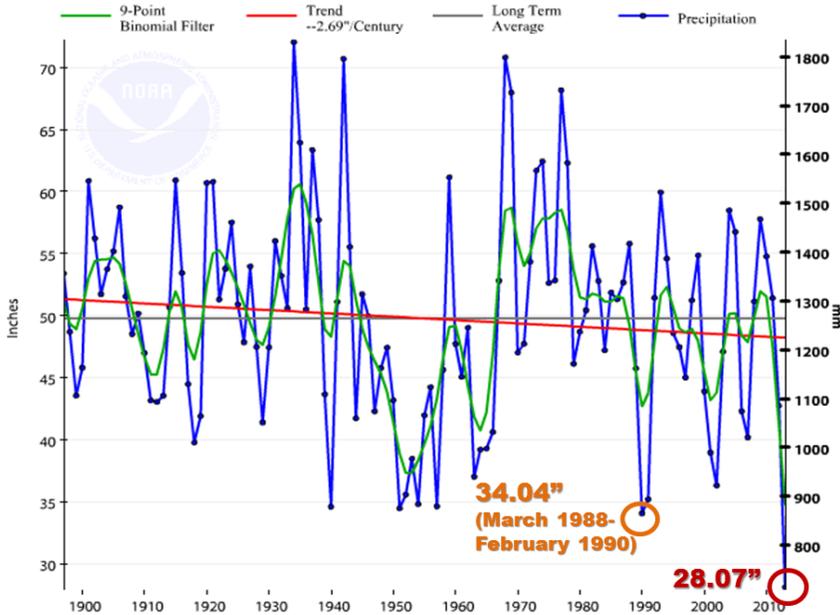
Water Crisis Will Continue to Deepen

In late February, we asked: Can it get any worse? In fact, it had. March is typically a month when drier conditions begin to set in across the Rio Grande Valley and the Rio Grande basin. Through the first full day of spring (21st), paltry rainfall has dominated the Valley, with a sole pocket of 0.10 to 0.39 inch in and around Brownsville. The remainder of the Valley had little more than a few sprinkles, but more importantly, several more long stretches of very low humidity. Temperatures averaged just a hair above normal for the first three weeks of the month, but punctuated by the first day of fairly widespread 100°F readings in 2013 at many inland locations on March 18th. Increasing sun angle and daylight was gradually increasing evaporation rates, and reservoir levels at Amistad and Falcon continued to drop as highly controlled releases began for the spring irrigation season (right).

8-4613.00 Rio Grande Below Falcon Dam Falcon TX
Data are provisional // Latest Data 3/21/2013 15:15 CST



Texas, Climate Division 10, Precipitation, 24-Month Period Ending in February

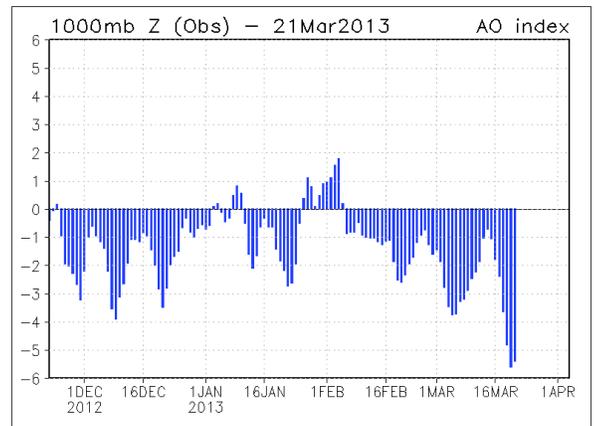


For the 24 months ending in February, rainfall across Texas Climate Division #10 (RGV – Hidalgo, Cameron, Willacy) was only 28.07 inches – another new record (since 1895) and obliterating the 34.04 inches that fell during the 1988-1990 period by nearly six inches! The warm, dry winter (December-February) set the table for what is likely to be a devastating spring for growers unable to irrigate, and worse, for municipalities who rely on water sources beyond irrigation to supply their communities. Conservation plans are being put in place in many areas. A few communities could be on the verge of running out of potable water as spring heads toward summer.

Why No Relief?

A number of factors (puzzle pieces) are contributing to the current drought, and expected worsening:

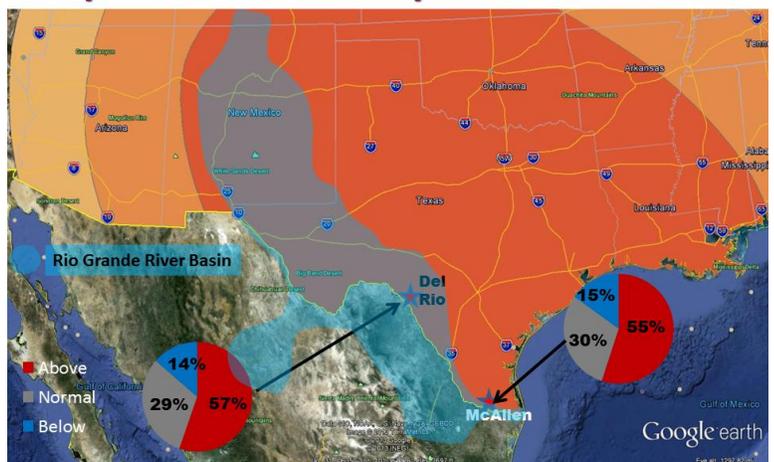
- El Niño/Southern Oscillation (ENSO).** The hopeful late summer 2012 trend toward El Niño, which tends to favor increased winter precipitation, died by October. By January, ENSO trended slightly negative - a “lean” toward the drier La Niña pattern. The six month forecast continues a negative “lean” in neutral phase (**right**), favoring continued dry and warm conditions across the Valley.
- Arctic Oscillation/North Atlantic Oscillation (AO/NAO).** A neutral but negative leaning ENSO signal combined with an expected “lean” toward the negative phase of the AO and NAO favors continued very dry, and generally warm, conditions across the Valley through spring (**right**).
- Pacific Decadal Oscillation (PDO).** Correlation between phases of the PDO and actual weather on the ground across the United States can be indeterminate. However, prolonged negative phase (“cold” phase) has favored drier conditions across the Valley, all other factors being equal.
- Positive Feedback Loops.** High sun angle and dry ground lead to additional heating, higher evaporation rates, more dry ground, more heating, higher evaporation, etc.



The Forecast

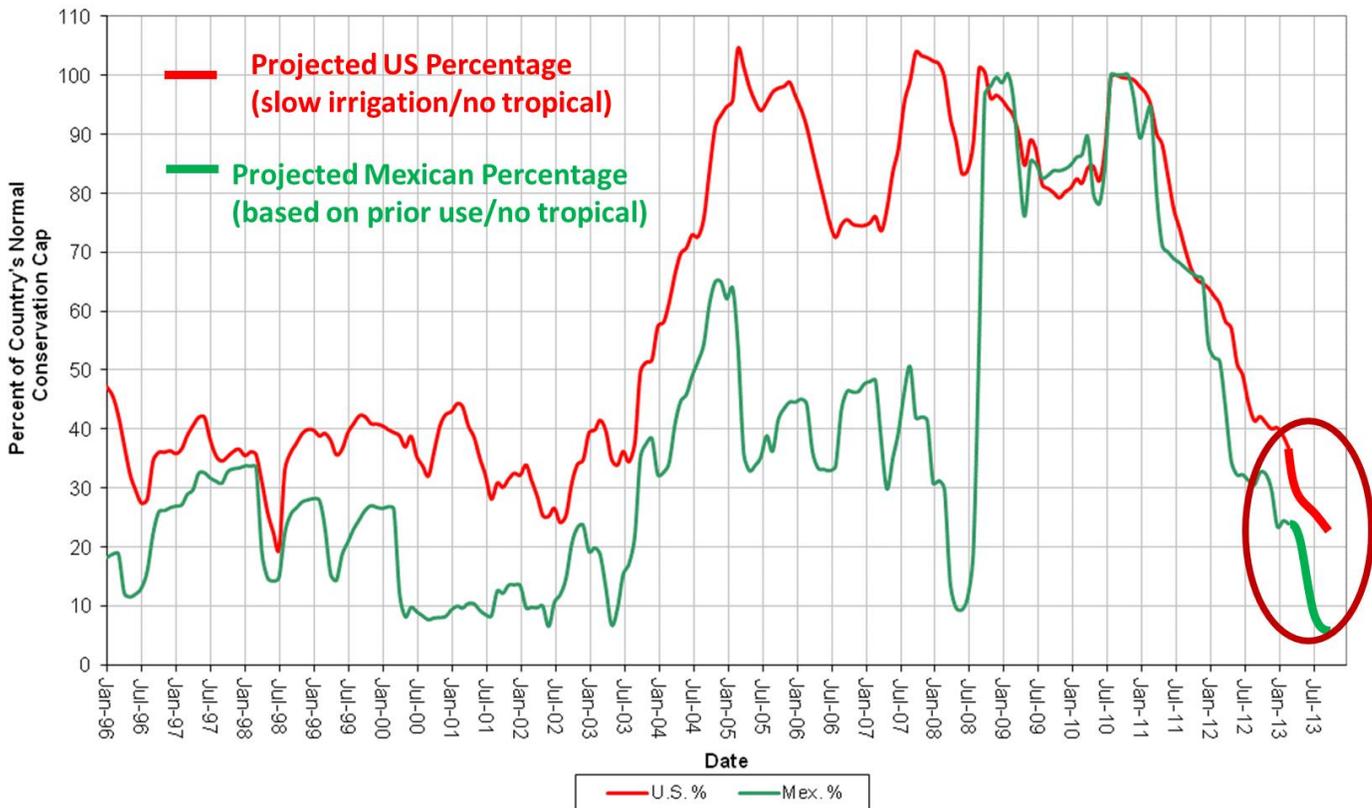
Confidence continues to increase on a continuation of above average temperatures (**right**) and below average rainfall through early summer (April through June). Spring is also the second driest season behind winter (December through February) in the Valley based on more than 100 years of data. The Rio Grande River basin is superimposed on the forecast probabilities; much of the headwaters that feed

April-June 2013 Temperature Forecast



the reservoirs continue to show the highest combined confidence of above average temperature and below average precipitation through the period. For much of the region, dominant daytime temperatures should begin April well into the 80s and soon be in the 90s as the month progresses; then reach the mid to high 90s to around 100 fairly often in May. June could be hotter still, with afternoon temperatures hovering around 100 on many days, especially west of Highway 77. Dry ground will continue to enhance lower humidity, particularly from the Rio Grande Plains/Ranchlands through the Big Bend region and beyond and include each reservoir and the rivers that feed them. Accelerating evaporation rates should bring Falcon Reservoir to or below 20 percent (total U.S. and Mexico pool) in May, with Amistad below 30 percent. Levels could drop lower in June if the dry pattern dominates. This is uncharted territory since the dams were built in the mid-20th century. On March 21st, pool levels at both Amistad and Falcon International Reservoir were similar to those around the turn of the century, when population on both sides of the border was more than 650,000 persons fewer than today, and agricultural market value of crops and livestock was nearly a third of what it is today¹.

Amistad-Falcon Percent of Conservation Capacity

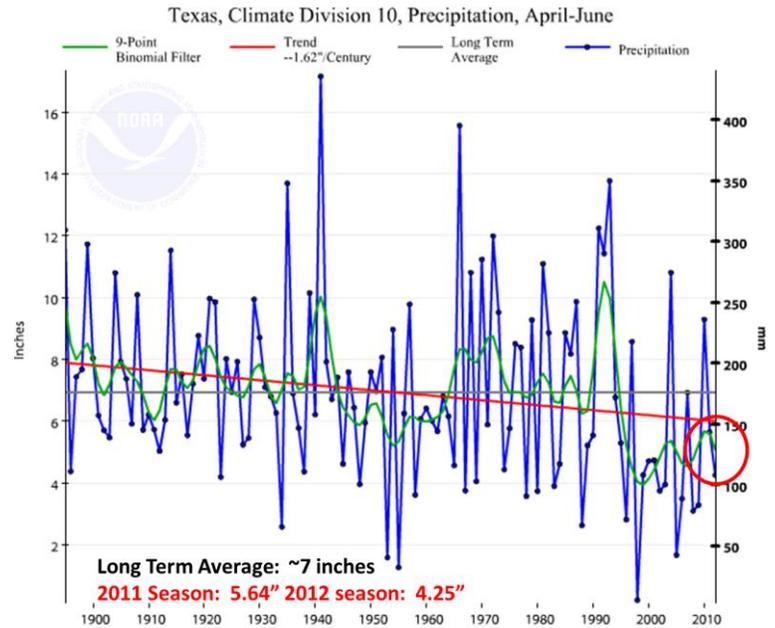


Above: Note the sharp drops in most springs and summers due to a combination of accelerating evaporation rate and spring irrigation use. The slightly slower drop in the U.S. is based on the possibility of a more measured irrigation release.

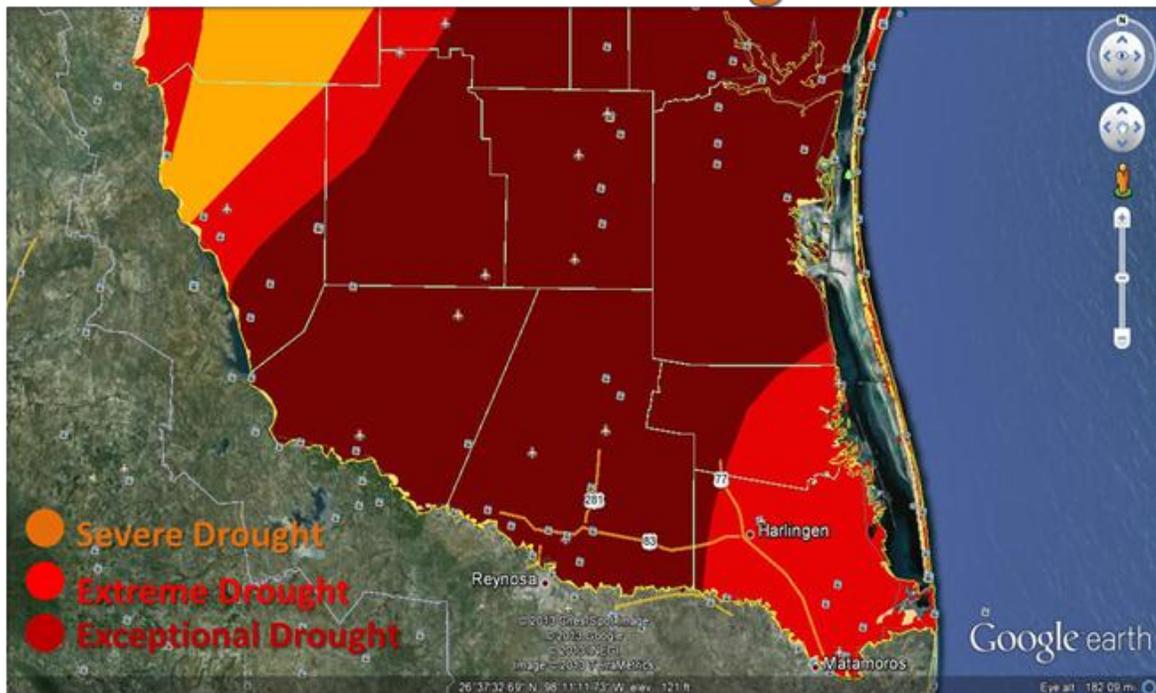
Rainfall, which averages around 7 inches between April and June, could end up well below this benchmark. An extremely dry total as in 1998 would be a worst case scenario. The current drought had below normal April-June rainfall, but generally within reason; 2011 averaged 5.64 inches and 2012 4.25 inches during the period. [Thunderstorms and the outer bands of Arlene](#) during the last week of June 2011 dented the drought...a little. Hailstorms and [locally heavy rainfall during the first half of May 2012](#) brought up the average a bit. Current trends suggest that Rio Grande Valley rainfall will end up below average, perhaps even worse across the Rio Grande Plains and the core of the Rio Grande basin. How much below average the entire region ends is the unanswered question. There is just as much chance for very dry conditions as there is for a period of torrential showers and thunderstorms to provide a welcome, if brief, respite – particularly in June.

Impacts

- **Water Shortages.** Irrigation water will be limited this spring; conservation and “smart” crop watering techniques will be vital to producing any yield of traditional crops (grain sorghum, cotton, corn), citrus, and vegetables. As of this writing, there are 22 public/municipal water supplies with restrictions along and near the Rio Grande, including two with severe restrictions (one each in Starr and Zapata County). [Some municipalities may run out of water.](#)
- **Rapid Spread of Wildfire.** Cold fronts will be less “cold” but still dry, similar to the spring of 2008 and 2011 than the spring of 2012. Gusty north to northwest winds will be accompanied by plummeting humidity, perhaps 10 percent or lower on a number of days through April. Combined with critically to extremely dry fine (grasses) and coarse (brush, trees) fuels, any fires that begin will spread quickly, perhaps explosively. Ranchers should take advantage of any low wind, moderate humidity days and thin any dead brush and cut high grasses early this spring, before hotter weather arrives. Others should follow smart tips provided [here](#). Remember, [only you can prevent wildfires](#).
- **Exceptional Drought.** As of March 21st, nearly the entire Texas border region near the Gulf was in Exceptional drought. Exceptional drought – the highest level – may ultimately spread east and west and cover all areas at some point in April and May. How late May through June fare will highly depend on if, and when, organized thunderstorms occur.
- **Heat.** Through March 21st, daytime temperatures were where they should be, ranging from the upper 70s to around 80. However, heat “spike” days became more common particularly for the Middle and Upper Valley. On March 4th, 17th – 19th, and (expected) on March 23rd and possibly the 24th, highs surged into the 90s or even 100°F. Increasing heat will combine with increasing humidity at the surface ahead of fronts to make it feel more like June and even July more frequently as April turns to May, and July+ like heat could arrive by June.



March 19th 2013 Drought Monitor



What You Can Do

- **Conserve Water!**
 - Take fewer and shorter showers.
 - Install low-flow toilets, faucets, and shower heads.
 - Recycle used household water for plant irrigation rather than turning on the spigot.
 - Repair leaky faucets, showers, or other plumbing.
 - Check appliances, such as dishwashers and clothes washers, for water efficiency.
 - Let your grass grow to better accept condensation from dew, and irrigate infrequently.
 - Wash cars seldomly.
 - Consider rain barrels (cisterns) to collect whatever falls this spring. . Check out how on page 3 of the [Winter 2013 Coastal Breeze web letter](#).
 - You may also want to collect condensate water from air conditioning units Consider becoming more drought tolerant. [Xeriscape or landscape](#) with drought-hardy plants.
 - Read more Texas water conservation tips [here](#).

- **Conserve Energy!** Hot, dry weather is typically a drain on electricity. We're all in this together; the energy you save can save you and your community money – or more – during exceptional drought.
 - Check your walls, foundation, and roof for air leaks.
 - Service your heating, ventilation, and air conditioning (HVAC) units to ensure they are not using excessive energy.
 - Set your thermostat to a higher temperature when you're not home
 - Install or use an attic fan to improve ventilation
 - Read more Texas energy conservation tips [here](#).

Keep Updated

Point your browser to <http://weather.gov/rqy/?n=drought> through spring to see the latest updates on drought conditions, drought forecasts, and rainfall deficits. Join us on [Facebook](#) or [Twitter](#) to keep updated on shared information from our core water, environmental, forest, and emergency services partners as the dry and increasingly warm to hot spring continues.

¹USDA [Census of Agriculture](#), 2002-2007. The 2012 Census is being finalized in early to mid-2013.