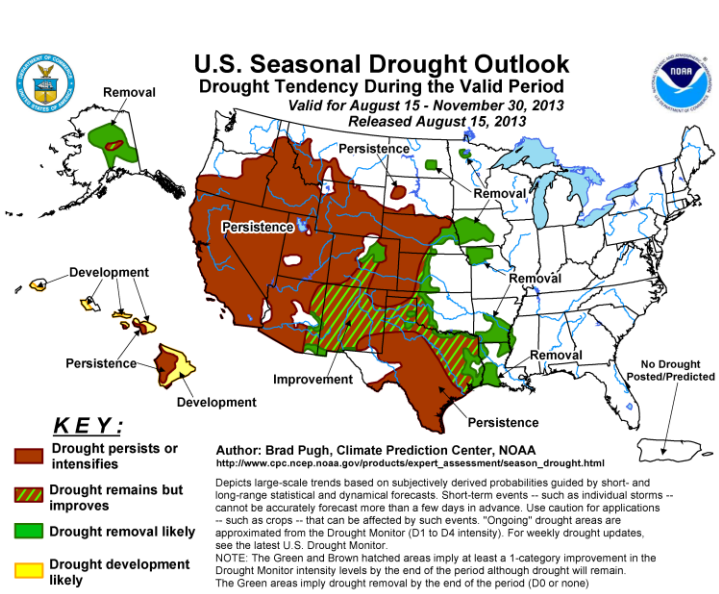
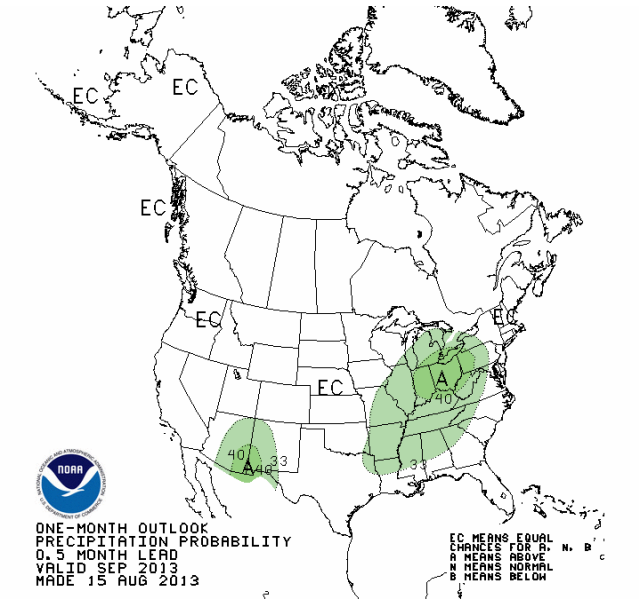
September-November 2013 Outlook (Mid August Issuance)





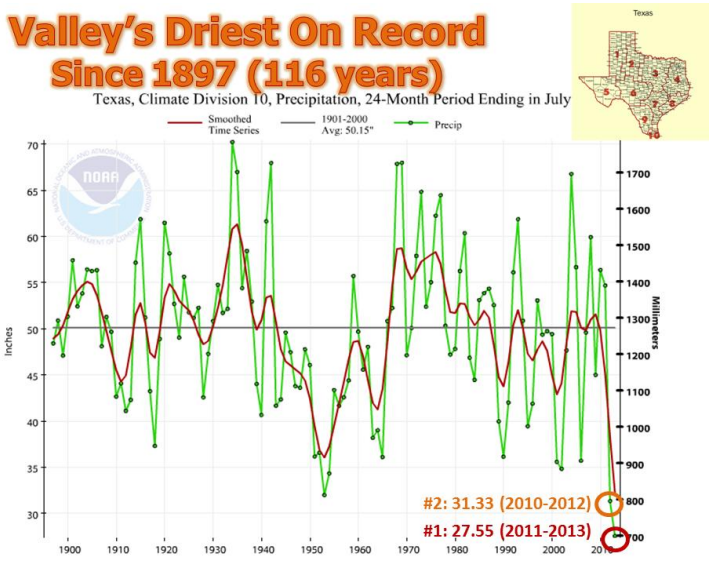
Left: Seasonal Droughtlook, September-November 2013, indicating persistence or worsening of current drought conditions across much of Texas. **Right:** Precipitation outlook, September 2013. "EC" generally indicates a 33.3% chance of below average, average, or above average precipitation for the month. For the RGV, average September rainfall is 4 to 6 inches (1981-2010 cycle).

Is There any Hope for RGV Drought Relief?

First Look at Autumn 2013 Leans Against It But A Bit More Rain Possible

Only a Tropical Storm or Hurricane Can Dent the Record Drought

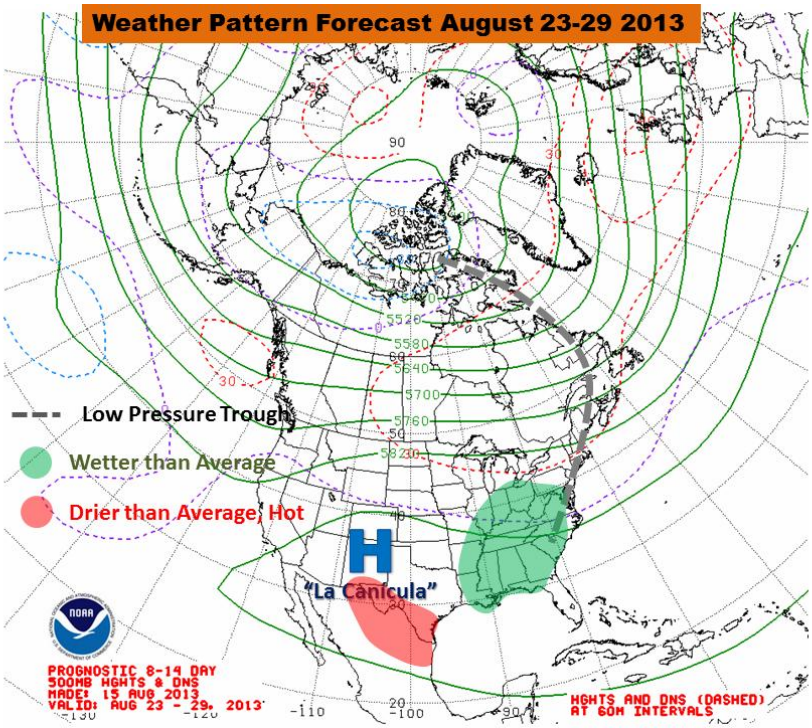
The 2013 Autumn Outlook (September – November) is one of the more difficult forecasts in recent months for the future evolution or continuation of a pattern that has dominated the Rio Grande Valley since October 2010, and has led to two consecutive 24-month periods of record low rainfall (below right) since records began in the late 19th century. The completion of August is looking more likely to see yet another month with many areas below average (average across the Valley is 1.5 to 2.5 inches); September, with an annual rainfall peak (4 to 6 inches on average), will be most critical to the future of the drought heading back into the drier late autumn and winter season. With the El Niño/Southern Oscillation (ENSO) expected to remain "parked" in neutral through winter, the potential for average to below average rainfall and above normal temperatures is great for November and beyond.



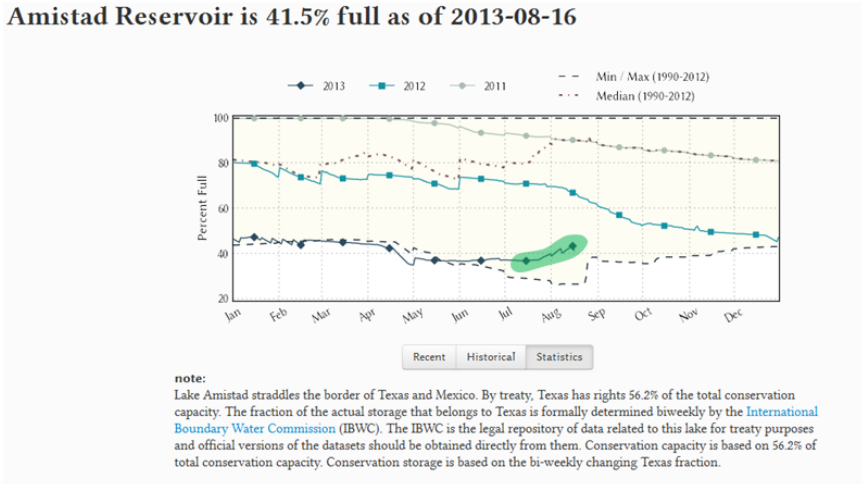
End of August Outlook

A disorganized tropics, combined with a general continuation of "La Canícula" (The "Dog Days" of summer, featuring high pressure dominant over northern Mexico and the southern Rockies/southern Plains), indicated little hope for anything more than isolated to scattered sea-

breeze showers/thunderstorms through the end of August (below, top), including much of the Rio Grande Basin. A month's worth of water flows down the Rio Grande between Presidio and Amistad International Reservoir had pulled the Texas share of the conservation pool above the levels last seen in February (right), prior to distribution downstream to Falcon International Reservoir which was later used to supply water for agricultural irrigation and municipal use during spring. These flows, courtesy of [torrential rains and runoff in the Rio Conchos between July 17-21](), decreased steadily during the week of August 11-16.



Weather Prediction Center of 500 mb (~18,000 feet) pattern for August 23-29, 2013.



	Date	Percent Full	Water Level (ft)	Height Above Conservation Pool (ft)	Reservoir Storage (acre-ft)	Conservation Storage (acre-ft)	Conservation Capacity (acre-ft)	Surface Area (acres)
Today	2013-08-16	41.5	1,068.43	-48.57	1,088,390	763,153	1,840,849	27,901
Yesterday	2013-08-15	43.5	1,068.19	-48.81	1,081,977	801,567	1,840,849	27,751
2 days ago	2013-08-14	43.1	1,067.82	-49.18	1,071,959	794,145	1,840,849	27,518
1 week ago	2013-08-09	40.8	1,065.65	-51.35	1,014,345	751,463	1,840,849	26,169
1 month ago	2013-07-16	37.1	1,057.91	-59.09	831,288	682,728	1,840,849	21,743
3 months ago	2013-05-16	36.9	1,055.93	-61.07	789,764	679,715	1,840,849	20,703
6 months ago	2013-02-16	43.6	1,066.32	-50.68	1,031,848	802,210	1,840,849	26,581
1 year ago	2012-08-16	66.8	1,090.39	-26.61	1,852,092	1,230,210	1,840,849	43,705

* Percent Full is based on Conservation Storage and Conservation Capacity.

Statistics for Amistad International Reservoir, August 16, 2013. Green shaded area shows rise in Texas water share (percent) since July. Red circled areas on chart show acre-feet of conservation storage on August 16th and February 16th, 2013, respectively. For more, surf to http://waterdatafortexas.org/reservoirs/individual/amistad .

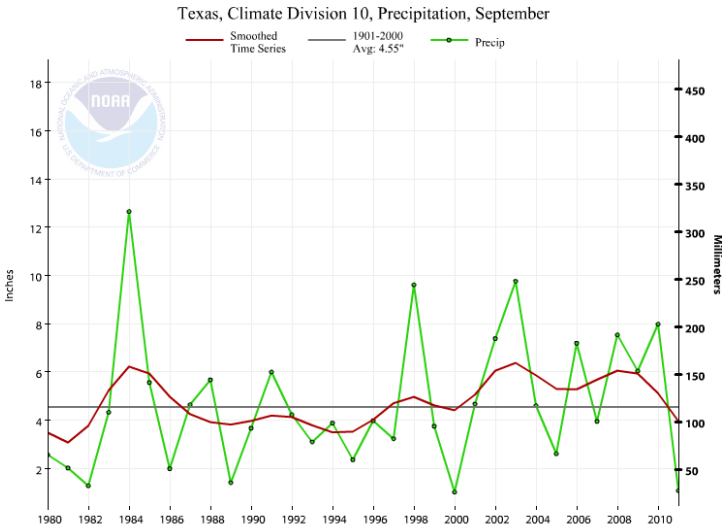
As of August 16th, water levels at Falcon International Reservoir had fallen to 21.1% (Texas share). Decisions on releases from Amistad to Falcon (Texas share only), and potential distribution thereafter, will be made by the Texas Commission on Environmental Quality. Note that Texas has rights to a little over 56 percent of the total conservation of Amistad, and just under 59% of Falcon.

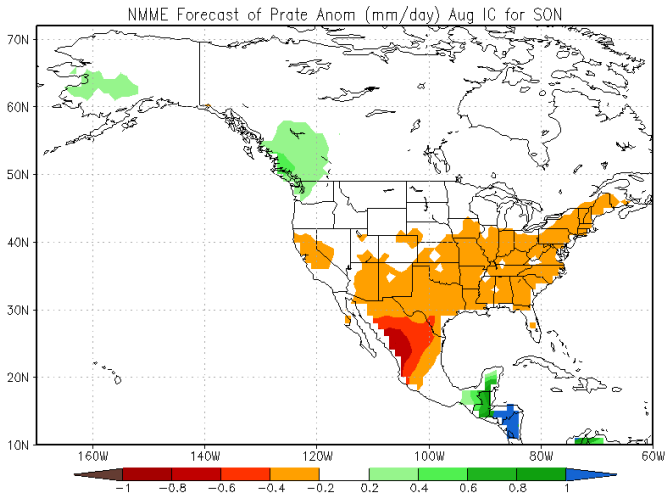
September Song: Uncertain, Leaning Dry?

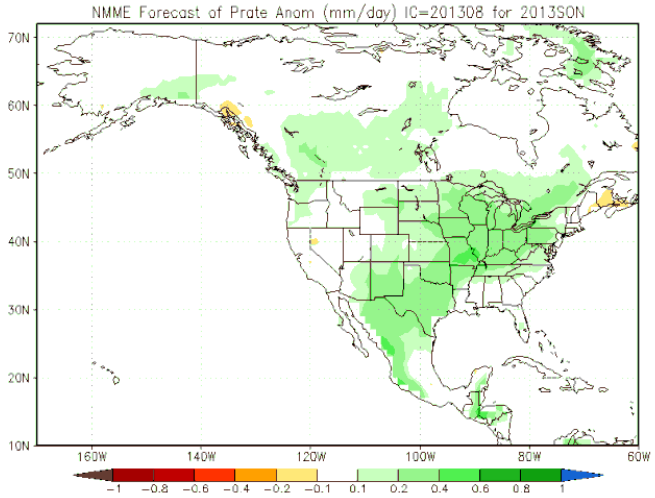
September is most critical, on average, for getting rainfall that can help saturate soils and help agricultural and residential users replenish water supplies to help crops and plants to grow – and assist local jurisdictions with water storage to help supplies through the drier late autumn and winter months. In 2011 and 2012, the usual rainfall – 4 to 6 inches on average (right) – was scarce or non-existent. How is September 2013 shaping up? Very tricky.

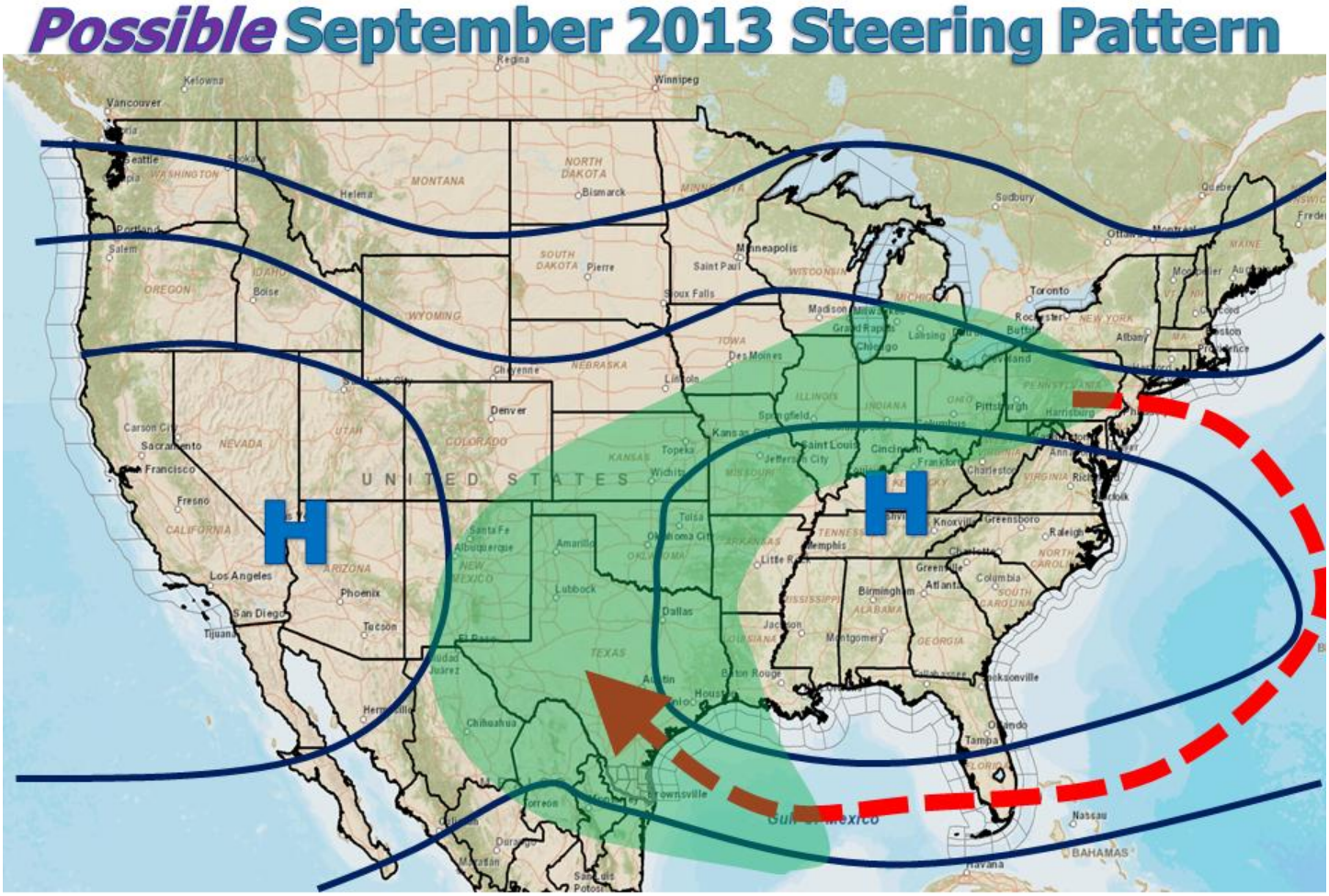
Reasons for the Difficulty

- Fluctuating North Atlantic Oscillation (NAO). For the last ten day of July and the first half of August, the NAO slid into the negative, which may have helped reinforce La Canícula while bringing a taste of autumn to the northeast U.S. Through early September, the NAO is forecast to be largely positive, which *could* shift the ridge toward the U.S. east coast and leave the western Gulf open to easterly waves, tropical waves, or developing cyclones.
- Seasonal climate models (examples below) for the September - November period indicating higher potential for *above* average precipitation over much of the Rio Grande basin (right image), something that hasn't been seen in the balance of these models since the current drought began. Left image was the forecast for September-November 2011.
- Uncertainty for the exact position of any ridge that develops from the Great Plains to the east coast. An east-west aligned ridge would bring air clockwise from the continent into the west central Atlantic, and turn south and eventually westward into the Gulf. A general flow from the east or northeast would bring less efficient rain-producing moisture than a flow from the southeast.
- Last but not least, tropical cyclone development. Is a Beulah (September 20-22, 1967) in our future?









Above: "Best guess" interpretation of *seasonal climate model aggregate* for atmospheric steering pattern in September 2013 (October/November included in aggregate; additional energy from mid latitude storm systems would increase precipitation areas in the north central/northeast U.S. beyond those shown). Flow around a high pressure ridge cell across the southeast U.S.(red dashed arrow) would be able to accumulate some moisture from the Atlantic, Gulf, and perhaps tap the Caribbean and increase the odds for precipitation across parts of the Southern Plains and New Mexico. Note: How moisture manifests into actual rain will be determined by whether individual energy impulses, or waves, can activate it, especially in Texas. Green areas do not necessarily imply above average rainfall, just a better opportunity for rain than other areas.

The possible steering pattern above **needs only minor adjustment** to change potential outcomes in south Texas for the worse. A shift of the southwestern U.S. High pressure (Blue H) just 500 miles east would tend to "lock out" the necessary moisture for at least average rainfall, as has been the case each September since 2011. Will La Canícula shift west, or 'stretch' toward the east? Such a "lock out" would ensure life and livelihood impacting drought and bring long term rain totals into unprecedented territory and well below records set in the 1950s. Confidence for such specifics is low more than three weeks out, and a lot could change with the forecast by the time Labor Day arrives.

As we always say, stay tuned, and be prepared for the peak of hurricane season, as well as the potential for locally heavy rainfall and urban flooding which is a common occurrence in a normal September.