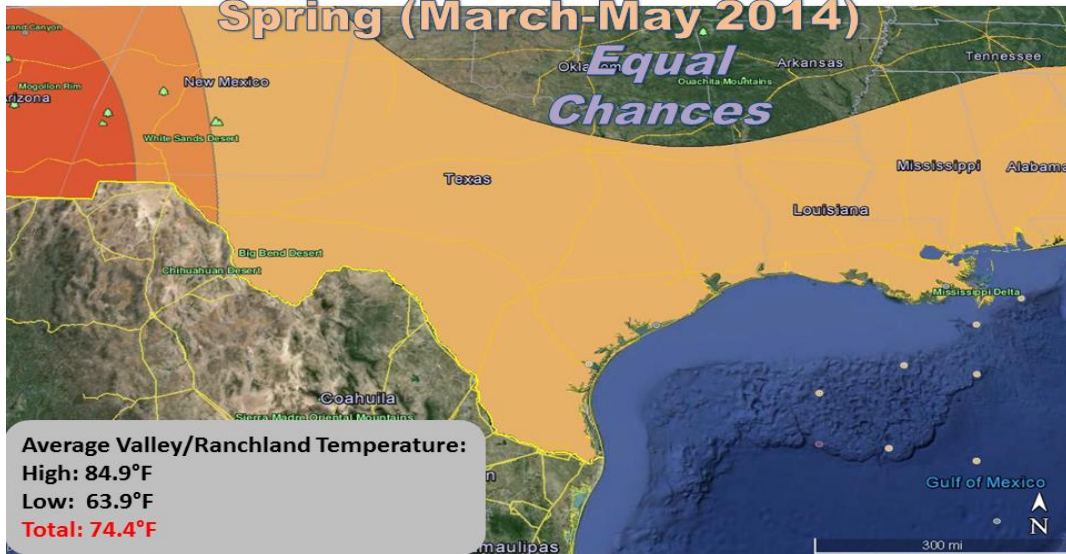


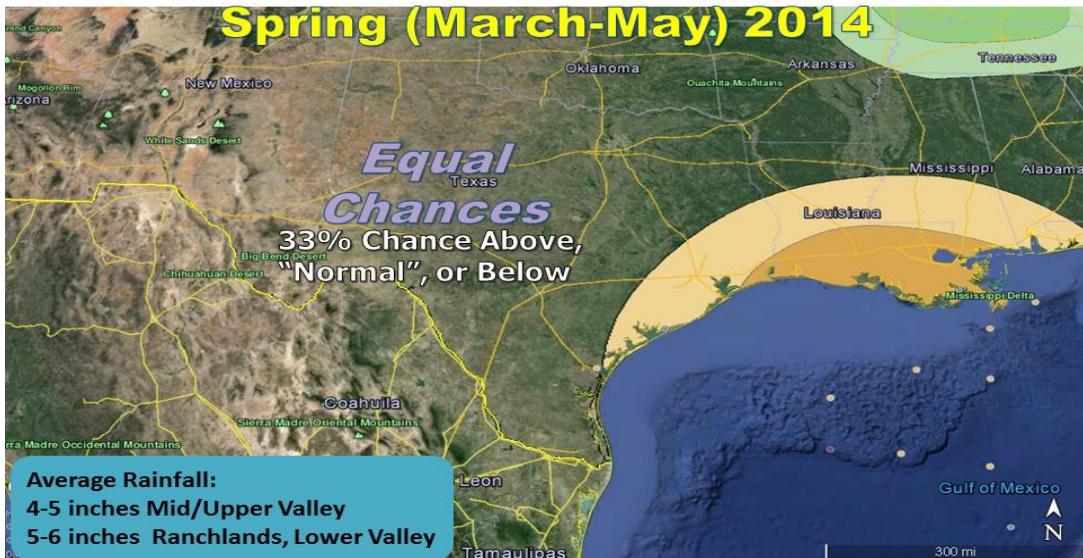
Temperature Outlook

Spring (March-May 2014)



Rainfall Outlook

Spring (March-May) 2014

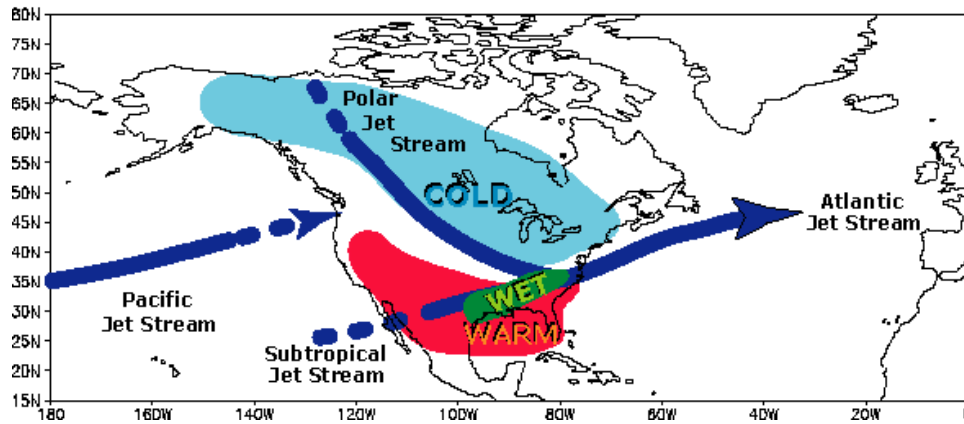


Spring 2014: (Still) Figures to be Warm, Dry Confidence High Once Again as Winter Pattern Lifts North

Overview

Though “*mea culpas*” will be common at the end of Winter 2013/14 (December-January) for much of the U.S. east of the Continental Divide, based on a somewhat surprising outcome of noticeably colder than average temperatures across nearly the entire eastern two thirds of the nation – of which a sizable portion including Texas and Oklahoma – was expected to be confidently warmer than average. Research into why winter fooled the experts will be conducted, and there’s little doubt that the stability of the neutral phase of El Niño Southern Oscillation (ENSO) will play a role in the potential for seasonal forecast busts (top of next page). The good news? A stable, neutral ENSO generally favors warmer than average spring temperatures across the southern U.S.

TYPICAL WINTER PATTERNS DURING ENSO-NEUTRAL YEARS (14 CASES: 1961-2000)



Above: Prevailing pattern of the jet stream(s) and general weather during ENSO-neutral winters. Only slight deviation in each stream (blue arrows) can change observed conditions. During the winter of 2013/14, the Polar Jet stream dipped up to 1,000 miles farther south than shown and brought a much farther southward surge of polar air all the way to the Gulf coast. The subtropical jet appeared from time to time, also farther south than shown and brought periodic precipitation to the southern tier from Texas to Florida between December 2013 and February 2014. Credit: NOAA, [wxbrad Blog](#).

Precipitation is a more difficult call and dependent on whether the subtropical jet (“southern stream”) can develop on occasion. With average springtime rainfall (above) between 4 and 6 inches across Deep South Texas, one or two energetic subtropical “waves” can produce these values in a small window of time between March and May, in the form of a robust squall line (similar to [April 28th, 2013](#)) or a multi-day period of showers and thunderstorms.

Talking Points

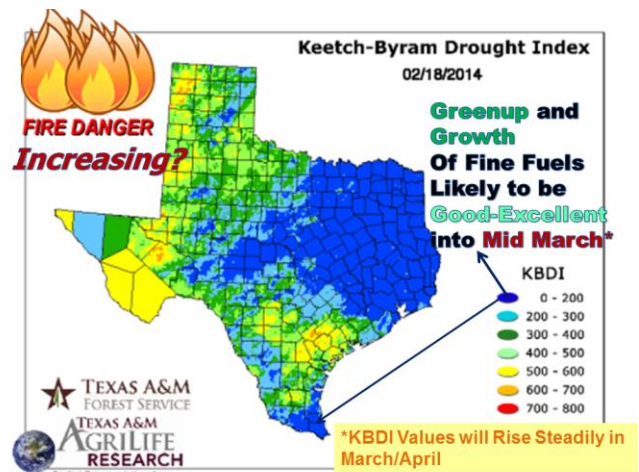
Greenup + Browndown = Wildfire Growth?

This is our biggest concern this spring. The combination of ample early winter rain events in [November](#) and [December](#) 2013, frequent cold, damp, drizzle events, and occasional minor freezes along with a Valley wide [ice storm](#) provided two potential spring concerns:

- **Valley Greenup and Growth** – Warm, humid conditions that followed the last of [the February 2014 chill](#) combined with ample soil moisture (right) to bring rapid greenup conditions to the agriculturally rich areas of the Rio Grande Valley to close out February. The greenup came with steady growth of fine fuels (grasses) and other flora, which will likely continue into early to mid-March.
- **Ranchland Curing** – Areas of northern Starr, Zapata, Jim Hogg, and Brooks County also received decent rainfall through the end of December, but missed out on nearly all of the activity in early 2014 through February 20th. Coupled with a typical number of low humidity days and at least six minor freezes, ungrazed or mowed lands that received ample rainfall in September may remain cured and see minimal greenup as spring advances.

Should the warm and “leaning” dry forecast verify – and there were suggestions for a continued warm, dry lean into early summer 2014 – late February through early March greenup and growth could quickly become late March and April “browndown”. Unlike the parched springs of 2012 and 2013, where fuels were sparse and greenup only in pockets due to record to near record dry summers, spring 2014 begins similarly to 2011 across the Rio Grande Valley. In 2011, more than 50,000 acres of rangeland burned in over a dozen fires across the Deep South Texas ranch/brush country to the edge of the Rio Grande Valley. In 2014, the region can avoid the same fate by [being Firewise](#), and taking a cue from [Smokey Bear](#).

Remember: ***The best fire is the one that never starts!***



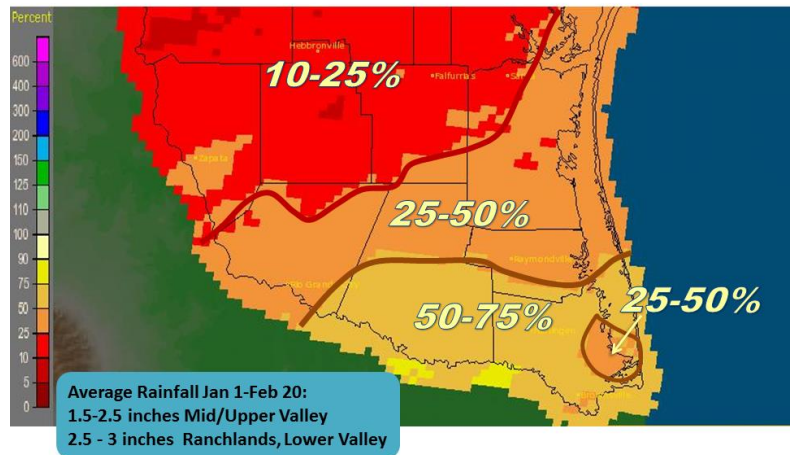
Talking Points (continued)

Return of the Drought?

The expectation of above average temperatures and a “lean” toward drier than average precipitation in a season when increasing sun angle and a steady warming are par for the course increases the likelihood that all of the Rio Grande Valley and neighboring ranchlands will return to some level of drought from March through May. First to return will be the mid Valley and ranchland areas that continued “Abnormally Dry” (below, left) on February 20th; the Rio Grande Plains (Zapata, western Starr) will follow, and the Lower Valley will come later once winter’s stored soil moisture has been used up by crop/plant growth or lost to evaporation. Little additional rainfall has fallen since the soakers of late November and December; since January 1st, most of the region is below 50% of expected rainfall, based on the 1981-2010 average (right).

Percent Departure from Normal Rainfall January 1 - February 20 2014

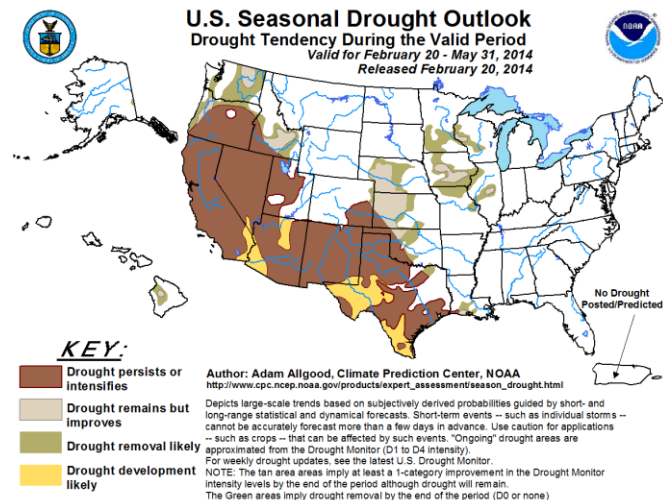
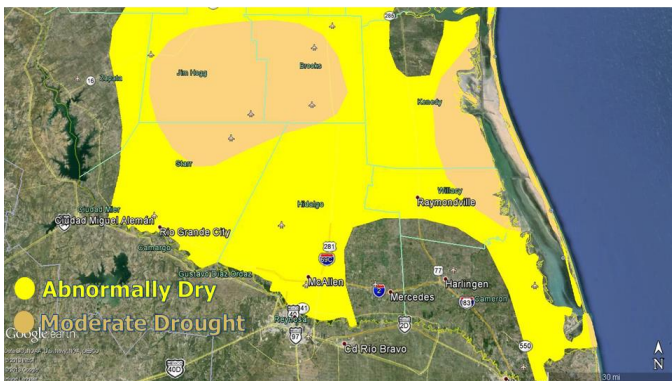
Brownsville, TX (BR0): Current Year to Date Percent of Normal Precipitation
Valid at 2/20/2014 1200 UTC - Created 2/20/14 17:49 UTC



Reservoir levels at both [Amistad](#) and [Falcon](#) on February 20, 2014 were both above the levels of late February 2013. Falcon was well above the 23 year minimum (dating back to 1990) but Amistad was sitting just above the 23 year minimum. Each spring, the combination of increased evaporation with at least one supplemental water release to Rio Grande Valley agricultural interests, brings levels down – unless an unusual rain event occurs in the Rio Grande/Rio Conchos basin in April or May.

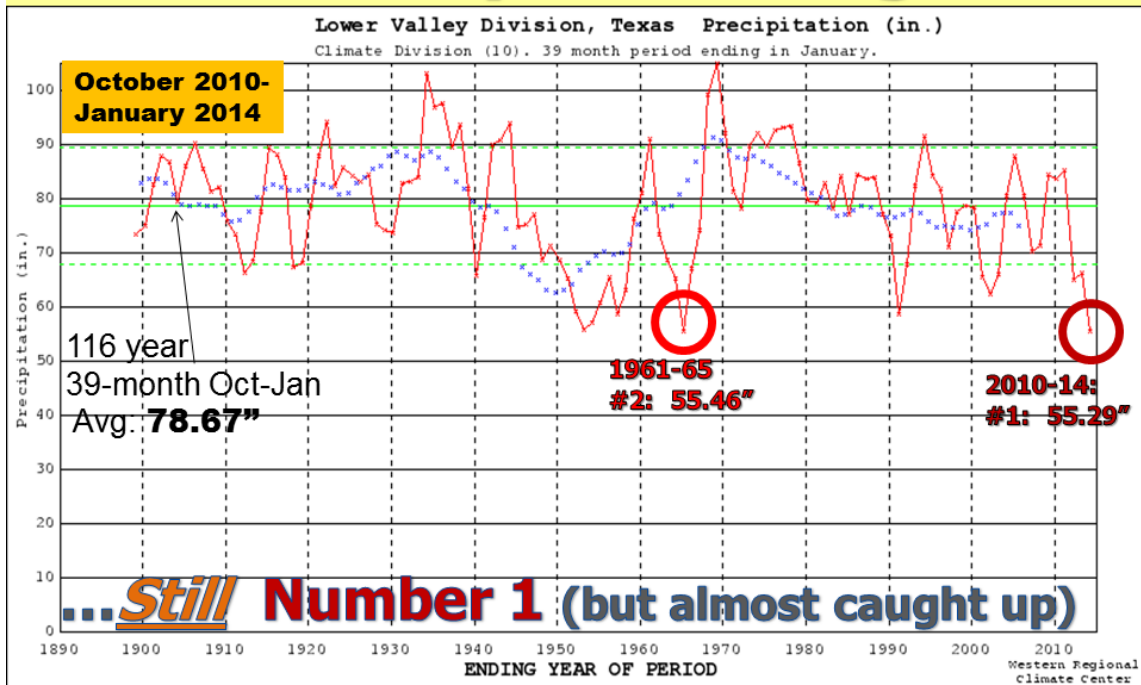
Ample initial growth of certain crops during early spring may require supplemental irrigation from reservoir releases by mid to late spring. Additional releases will be highly dependent on evaporation rates and supplemental basin rainfall; current forecasts suggest just one significant irrigation release is likely (comparable to 2013). Conservation practices are strongly encouraged by farmers and municipal water districts alike through the first half of 2014.

RGV Drought Monitor Mid February 2014



Above average rainfall in September, November, and December 2013, as well as near average rainfall in January, 2014, helped close the gap between the current dry period (which began around October 1, 2010) and the prior record (out of 116 such periods dating back to 1897) for Texas Climate District 10 (Lower Rio Grande Valley). The current period is virtually tied with the prior record, set between October 1961 and January 1965 – a little more than 23 inches below the 116 period average (next page).

Since the Dry Period Began...

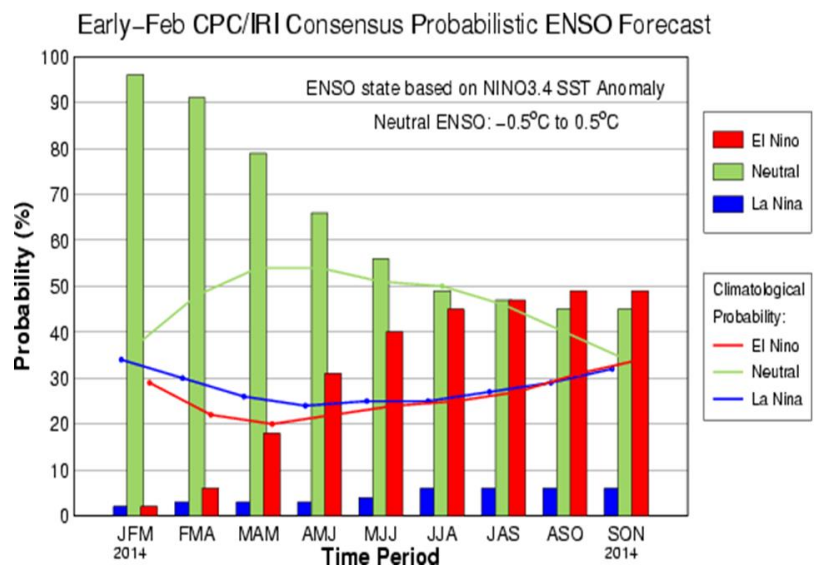


Talking Points (continued)

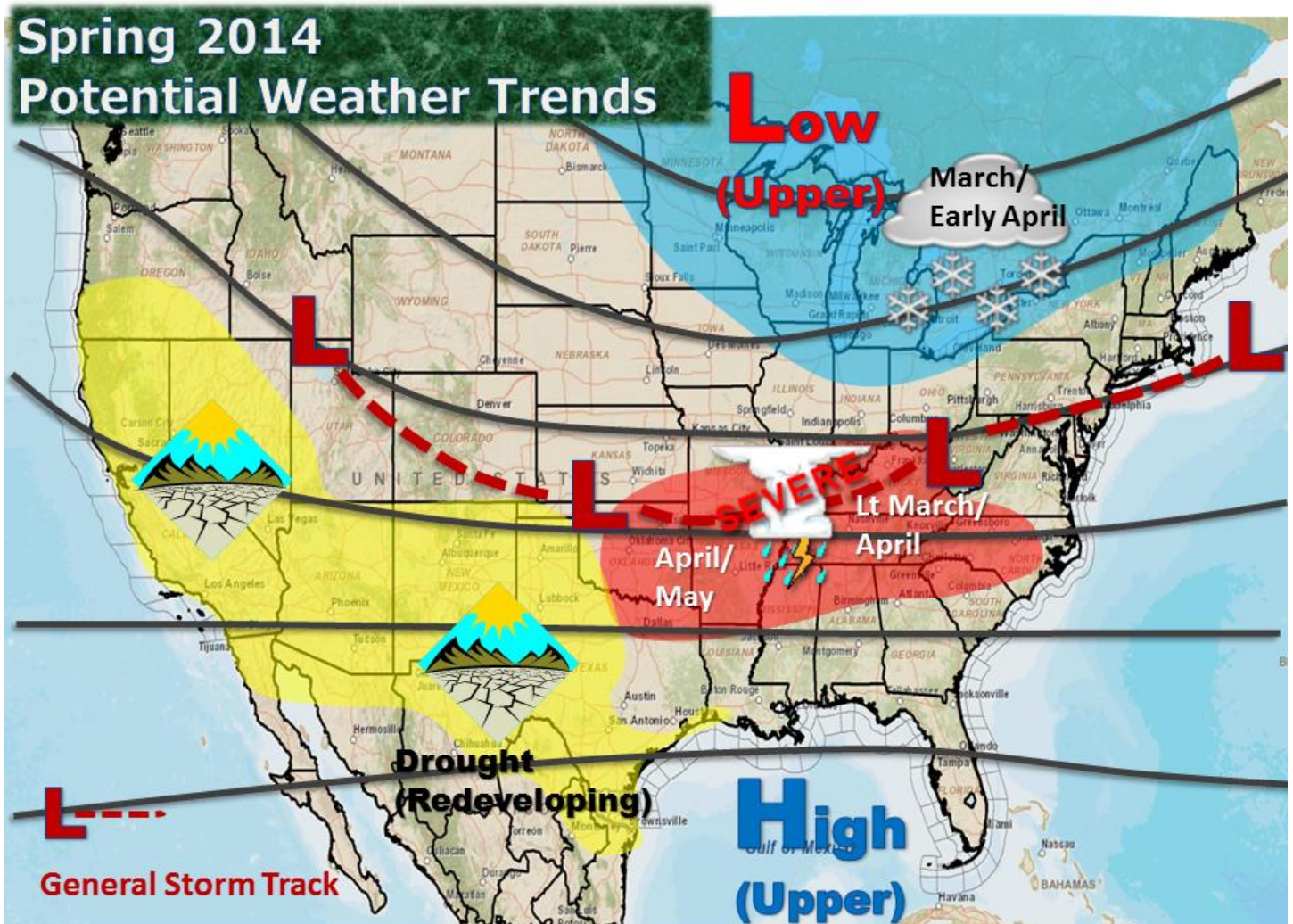
Severe Weather Season 2014

The Valley's Severe Weather (Damaging thunderstorm winds, hail, lightning, local flash floods, and tornadoes) Season typically begins in late March and ends by mid to late May. ENSO "parked" in neutral makes a seasonal forecast difficult. Spring 2012 became known as the "season of hail" during a period of transition from weak La Niña to neutral, but a similar ENSO transition in 2011 brought virtually no severe weather but [plenty of heat](#) during the prime season. Events few and far between made spring 2013 more similar to 2011 than 2012. The main difference between noisy 2012 and quieter 2011/2013 was the persistence of upper level disturbances in [a frequent pattern of southwesterly flow](#) that tapped tropical moisture and destabilized the atmosphere enough to bring at least eight separate severe weather episodes to the Valley. The persistence of an early winter positive phase of the Arctic Oscillation (AO), followed by a temporary February "break" in 2012 is very similar to the pattern of the AO from late 2013 into early 2014. Further data and research is needed to tie the combination of an ENSO-neutral spring with an early-mid winter positive phase AO to determine a statistically significant increase in severe weather across South Texas the following spring.

That said, the expectation of an active mid latitude storm track with hints of occasional southern (subtropical) stream disturbances – which has been the case since late November 2013 - seems to favor an increased possibility for a few more severe weather episodes in 2014 than in 2011 or 2013, but whether the ferocity and frequency of 2012 can be matched was virtually impossible to determine in late February.



The better opportunity for severe weather could favor the Dixie Alley/Lower Ohio Valley early (March and April) and the southern Plains later (April and May) where the stubborn, but retreating, jet stream “dip” (maintaining atmospheric cold air pockets) collides with increasingly warm and humid air that is drawn into individual storm systems tracking with the mid latitude jet stream. Time will tell, so stay tuned!



Talking Points (continued)

Otherwise...

The pattern (above) will lend itself to repeated episodes of the “[Valley Wind Machine](#)”, which impacts the region from time to time each spring. Days with 30 mph southerly winds gusting to or above 40 mph may be more frequent, particularly between US 281 (IH-69C) and US 77 (IH-69E), during March due to the expected storm track and the still cool waters of the nearshore Gulf of Mexico – each which will tighten the pressure gradient and enhance the winds. The “machine” should fade a bit in April and May, though could be a recurring theme especially if temperatures end up several degrees above average.