



**NATIONAL
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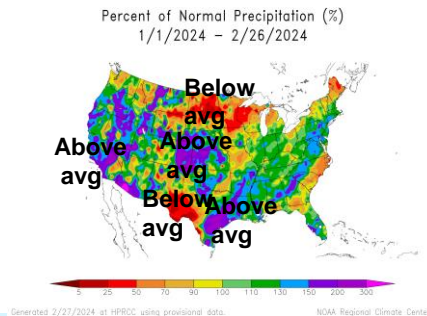
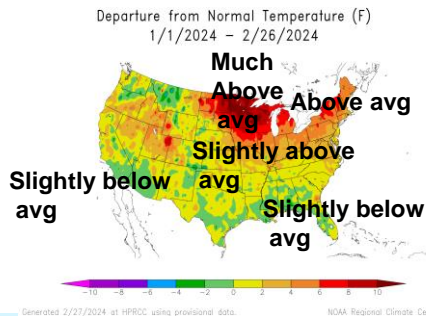
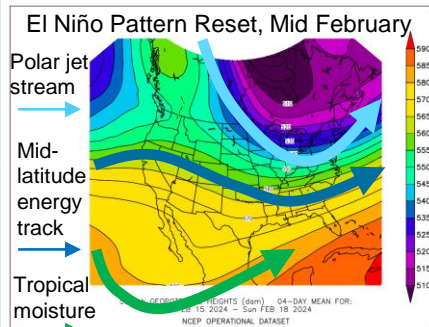
Spring 2024 Outlook: Perspective for the Lower Rio Grande Valley/Deep S. Texas Region

February 27, 2024

Barry Goldsmith and Andrei Evbuoma

NWS Brownsville/Rio Grande Valley, Texas

Drier and Warmer Trends Expected as El Niño Likely to “Flip”

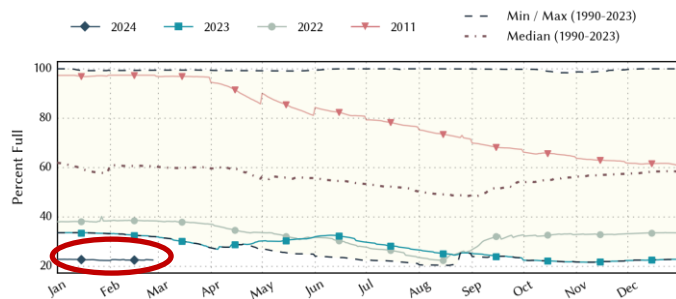


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Building a Weather-Ready Nation // 1

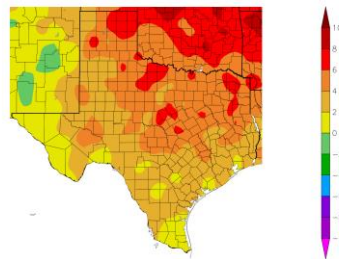
February 2024: First Area-Wide Beneficial Rain Since November 2023

- **El Niño's rainy** pattern returned for the third weekend of the month, bringing 150-400 percent of the monthly average in three days for the Rio Grande Valley (right; total rainfall for February 15-17, inclusive).
- **Dryness** developed across the Brush Country and Rio Grande Plains, but mid-month rains pushed longer-term averages into the plus category
- **Temperatures varied**, but a slightly warm start and a very warm finish pushed temperatures **into the above average camp**.
- Despite much above average rainfall for the populated Valley, limited rainfall across inflow regions to Falcon and Amistad reservoir kept them at record low levels (combined) for February.



Texas share of Amistad, Falcon, Red Bluff Reservoirs.
Credit: Texas Water Development Board.

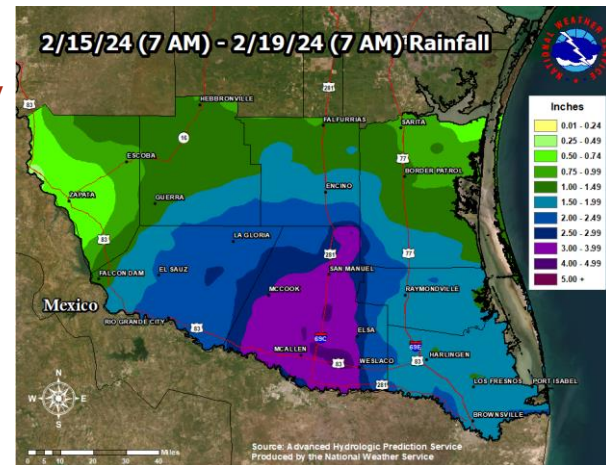
Departure from Normal Temperature (F)
2/1/2024 - 2/24/2024



Generated 2/25/2024 at HPRCC using provisional data.

NOAA Regional Climate Centers

February 1-24 departure from 1991-2020 average temperature. For the RGV, generally 1 to 2°F above average.



February 25, 2024 Month to Date Percent Precipitation

Created on February 26, 2024 - 21:44 UTC
Valid on February 26, 2024 12:00 UTC

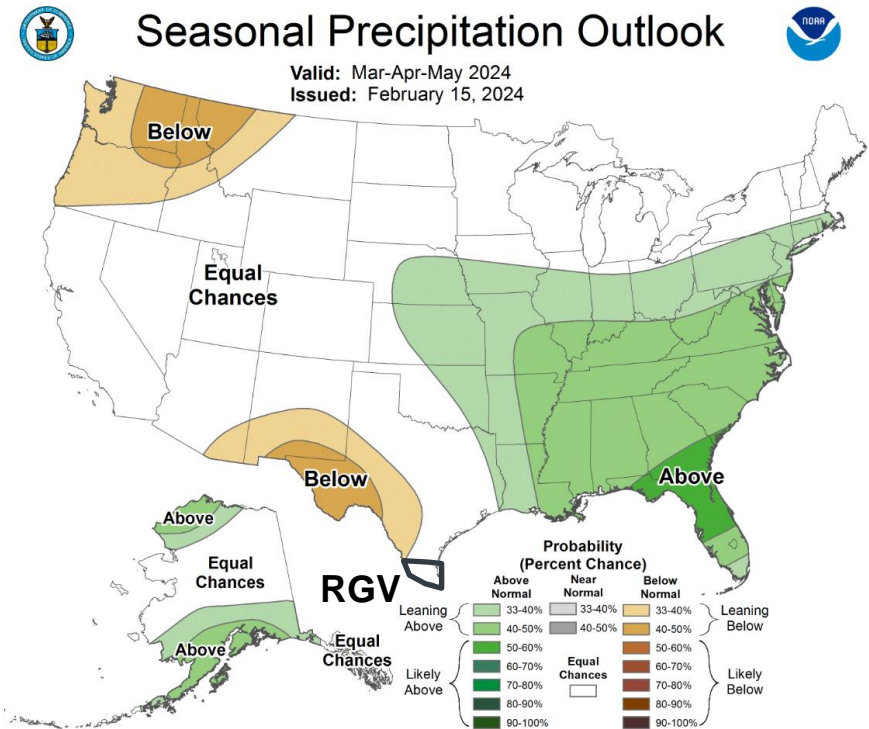
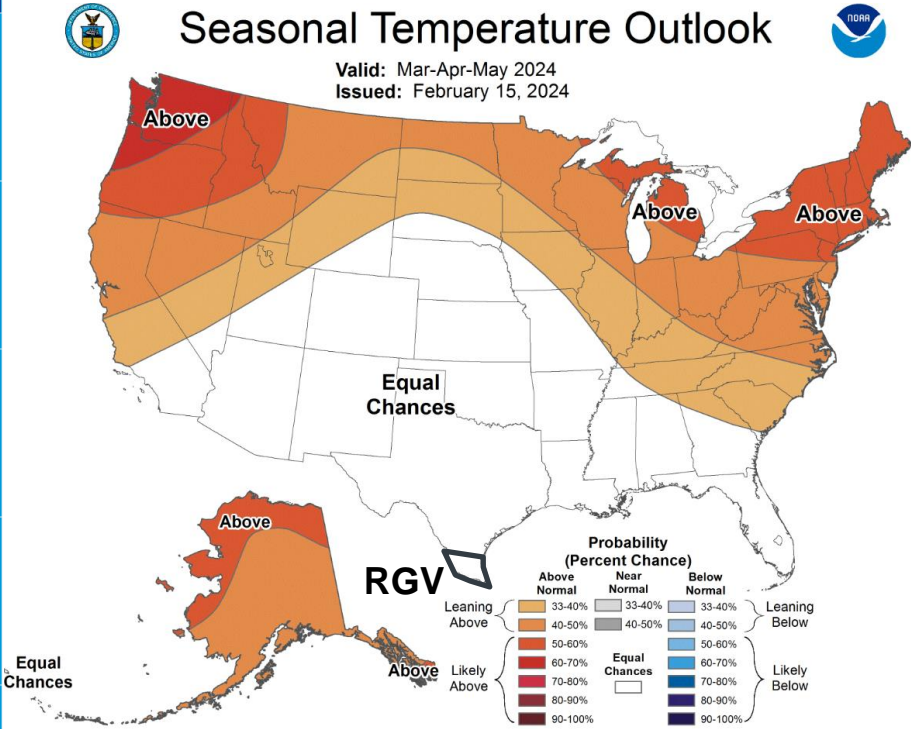


February 1st to 25th percentage of average rainfall. Note drier areas from Zapata through northern Jim Hogg, Brooks, and Kenedy.





Seasonal Forecast, Spring (March-May) 2024, USA



Key Takeaways: Spring 2024

Confidence is **medium** on rainfall outcomes, and **medium** on temperature outcomes. A lean toward dry and warm to hot is expected. Confidence is also **medium** on **dryness expansion or moderate-severe drought** redevelopment. Uncertainty is **high** on potential stormy period between late March and late May.

- Reservoir levels at Falcon rose in February due to sizable releases from Amistad, targeted for downstream use in Mexico. Amistad total water levels at the end of February were **at/near all-time record lows**. Confidence is increasing on warm and dry conditions across the reservoir inflow regions through spring, with accelerating evaporation rates in April and May. **Confidence is near-certain on total storage remaining at or near record lows through spring** based on the temperature/rain forecast.
- El Niño influences combined with other “teleconnections” between oceans and atmosphere will **determine the eventual “sense” of weather through spring**.
- While the trend **leans drier than average** deeper into spring, an active steering pattern could produce **between one and three widespread thunderstorm events** between late March and mid May. A steering pattern that shifts farther north would **reduce the potential/number of such events**. Confidence is **low-medium** on either outcome.
- **Severe Weather (hail, wind, flooding)** could arrive in mid to late March and peak in April and May. The number of events **will be fewer than in 2023** (there were six).
- **Stage 2 and 3 water conservation continued in several RGV municipalities in February. Status quo is likely through spring**, worsening in April and May if storms are infrequent.
- **90° days should arrive in March, and become more frequent in April** – especially if the month is dry. A few 100° days are likely in April and May, especially from Brooks/Hidalgo west to Zapata.



The “Why” of the Forecast: El Niño to Quickly Become Neutral in Spring

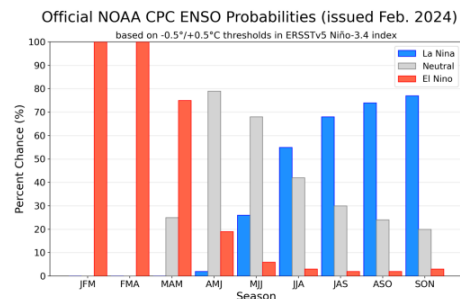
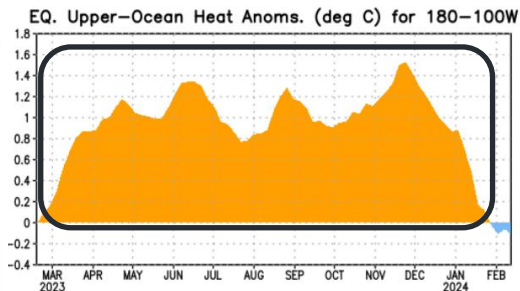
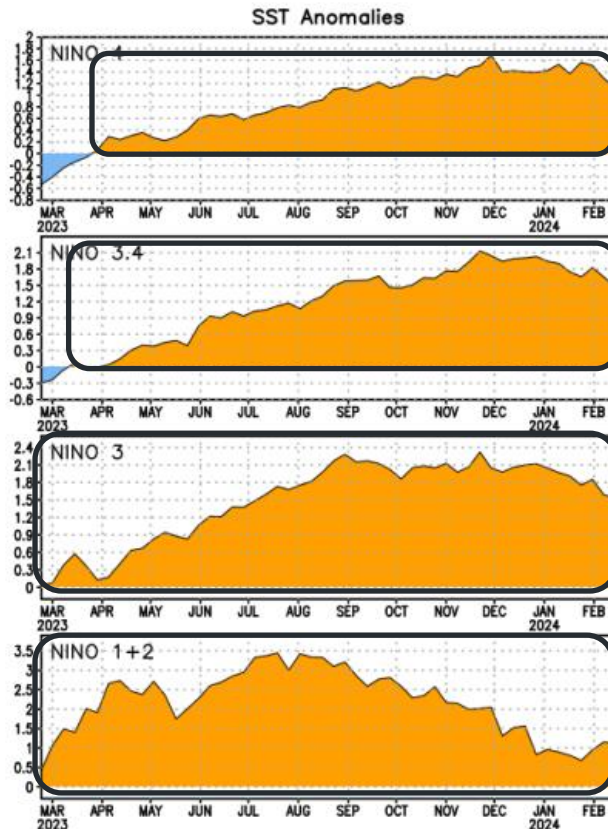


- El Niño helped resume an active subtropical jet in February, helping with a rainfall event between the 15th and 17th that dropped 150 to 400% of the monthly average.
- There are few signs that significant, non-thunderstorm heavy rainfall events are on the horizon through mid March.
- Late March through May could bring one to three thunderstorm episodes (fewer than in 2023). El Niño, Neutral, or La Niña do not determine the potential compared with individual atmospheric systems.

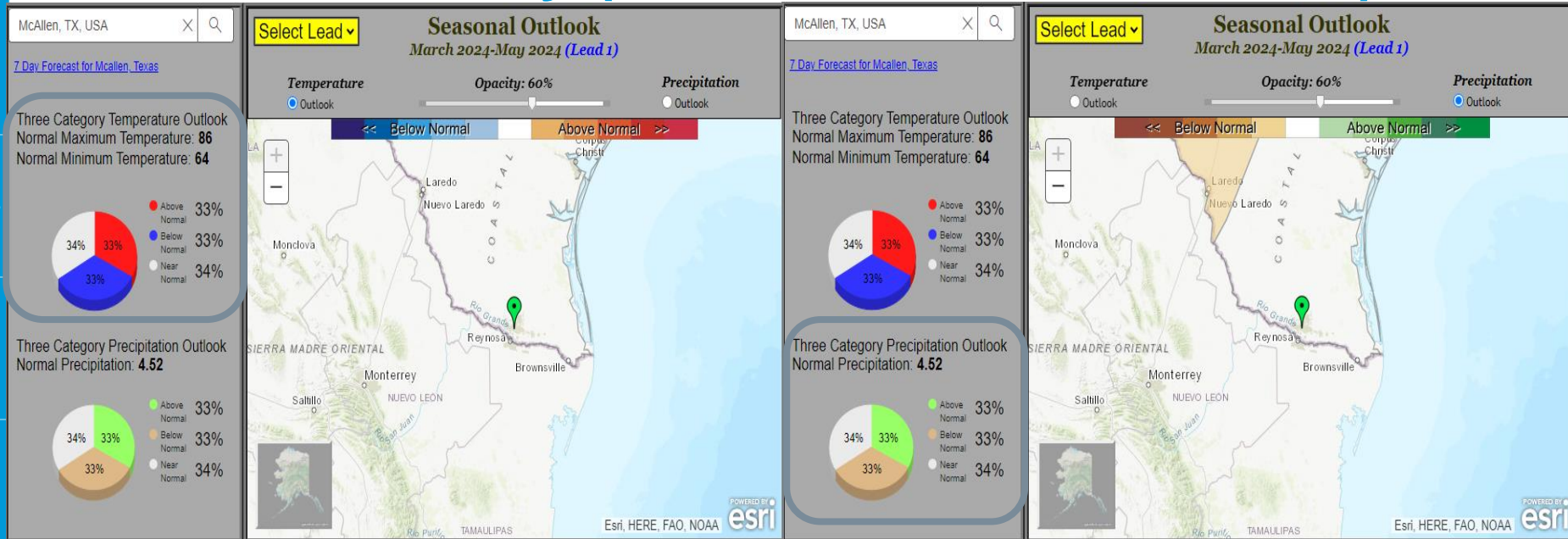


*Above right: Oceanic Niño Index. Values below -0.5 (light blue) for five consecutive 3-month periods indicated La Niña. El Niño (red, +0.5) officially began in April-June 2023, reached strong levels (1.5) by August-October 2023, and peaked at +2.0 for November-January.

Year	DJF	JFM	FMA	MAM	AMJ	MJJ	JJA	JAS	ASO	SON	OND	NDJ
2021	-1.0	-0.9	-0.8	-0.7	-0.5	-0.4	-0.4	-0.5	-0.7	-0.8	-1.0	-1.0
2022	-1.0	-0.9	-1.0	-1.1	-1.0	-0.9	-0.8	-0.9	-1.0	-1.0	-0.9	-0.8
2023	-0.7	-0.4	-0.1	0.2	0.5	0.8	1.1	1.3	1.6	1.8	1.9	2.0



The Spring 2024 Outlook: Rio Grande Valley (McAllen as Anchor Point)



- Temperature: Equal chances of above, average, or below average. RGV averages: Afternoon – Around 80 at start of March, rising to the mid 90s by the end of May. Wake-up: Around 60 in early March, rising to the low to mid 70s by the end of May
- Precipitation: Equal Chances of Above, Below, or Average. RGV averages: 4 (west) to 7 (east) inches.

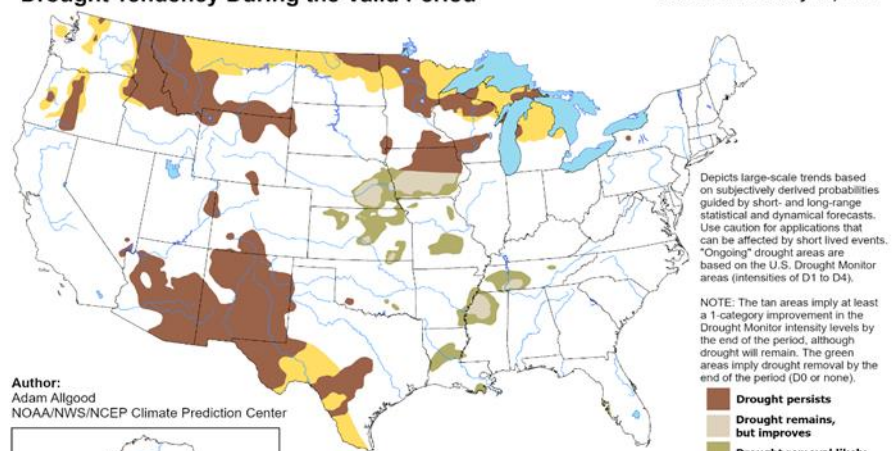


The February-April 2024 “Droughtlook”

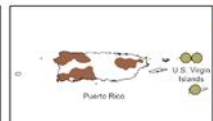
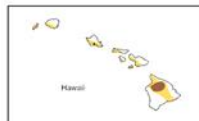


U.S. Seasonal Drought Outlook Drought Tendency During the Valid Period

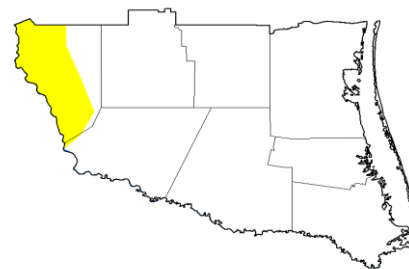
Valid for February 15 - May 31, 2024
Released February 15, 2024



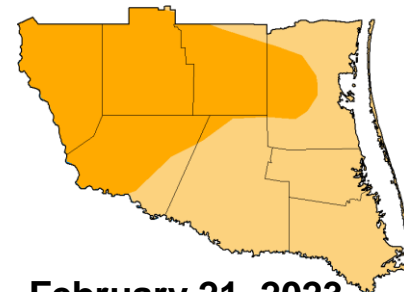
Author:
Adam Allgood
NOAA/NWS/NCEP Climate Prediction Center



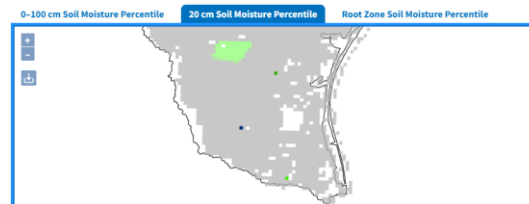
<https://go.usa.gov/3eZ73>



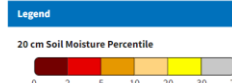
February 20, 2024



February 21, 2023



This map shows the moisture content of the top 20 cm of soil compared to historical conditions, based on in situ (in the ground) measurements of soil moisture from a wide range of state and federal mesonets across the continental U.S. These data are then interpolated into a 4 km grid.



Red and orange hues indicate drier soils, while greens and blues indicate greater soil moisture.

Drought Classification



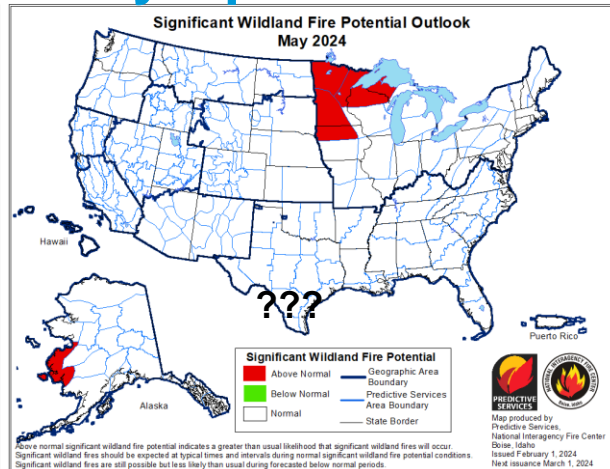
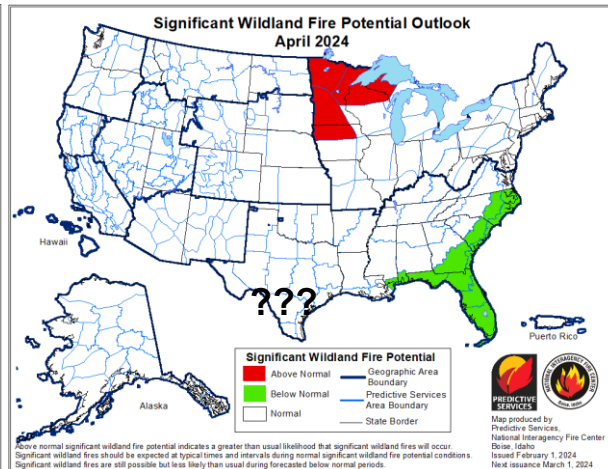
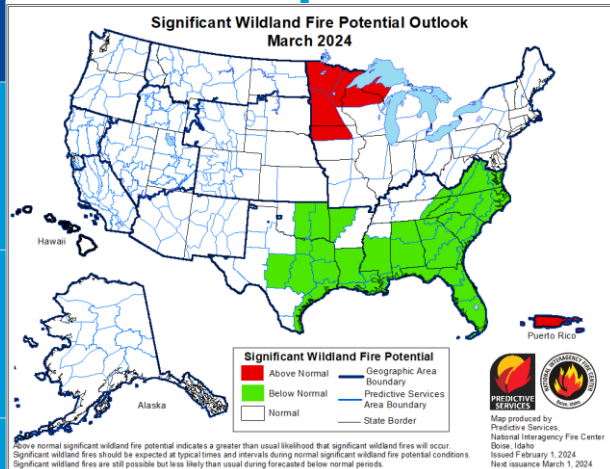
Dryness remained in Zapata County through February. A brief expansion into western Starr and much of Jim Hogg in early February was trimmed back after 1 to more than 2 inches fell in the expanded areas between the 15th and 17th. However, 4” (depth) Soil moisture remained in the 30-70% of average for much of the Valley’s crop-growing regions (Hidalgo/Cameron). Warm temperatures following the beneficial rainfall began “green-up” to the Rio Grande Valley counties.

Spring drought remains uncertain but is leaning toward expansion of dryness, followed by development of Moderate (level 1 of 4) to potentially Severe (level 2 of 4). The potential exists for one to three area-wide thunderstorm events, which would provide temporary relief.





Wildfire Spread Potential Could Become Issue by April



Green-up was in full swing across the Rio Grande Valley at the end of February. Grass loads are likely to become moderate in March.

March will not be an issue along/east of IH-69C, but **wildfire spread concerns may grow in Jim Hogg, Starr, and especially Zapata** due to continued low evaporation and a slight lean toward warmer and drier than average.

April and May will be highly dependent on “just in time” rainfall. The rain would come in the form of thunderstorm systems. If such systems are seldom or not at all, wildfire growth potential **will shift to above average**. The most likely locations would be west of IH-69C/US 281.



Green morning in east Brownsville,
February 12, 2024





Wildfire Prevention Review



- This **remains critical through autumn**, especially if severe to extreme drought continues over fuel-loaded rangeland north of the populated Valley. The 300+ acre fire at Santa Ana NWR happened in September, as did a similarly large fire in Starr County.
- Continue to focus on **farm, ranch workers, and other persons who might drive hot vehicles** on parched brush on critical/near-critical days – especially low humidity, breezy days following fronts.



Infographics for Wildfire Prevention

Fire Weather SAFETY TIPS

- Be careful to not drag trailer chains that could cause sparks.
- Do not park on dry grass.
- Avoid outdoor burning and check recently burned piles for flare-ups.
- Clear out dead vegetation from around your home.
- Be careful when welding in dry grass.

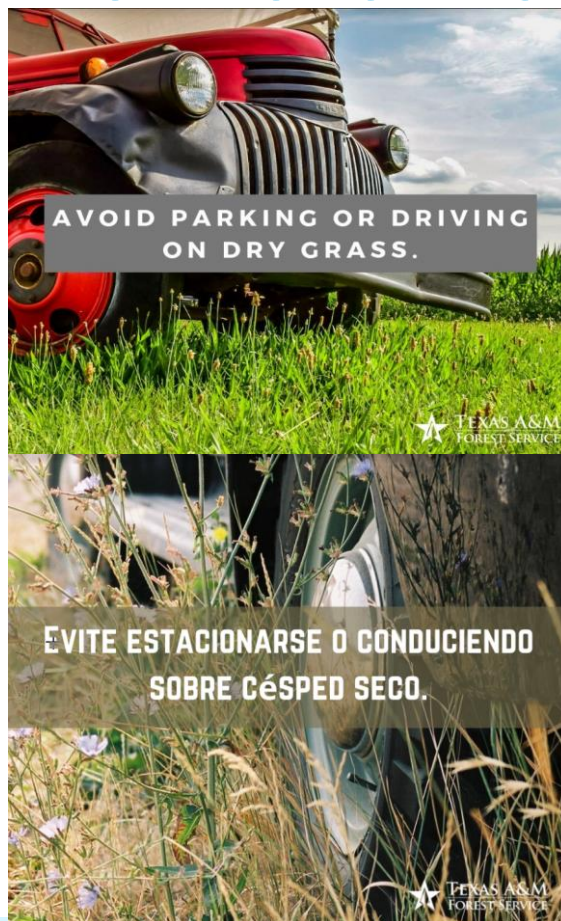


Consejos de Seguridad Contra Incendios

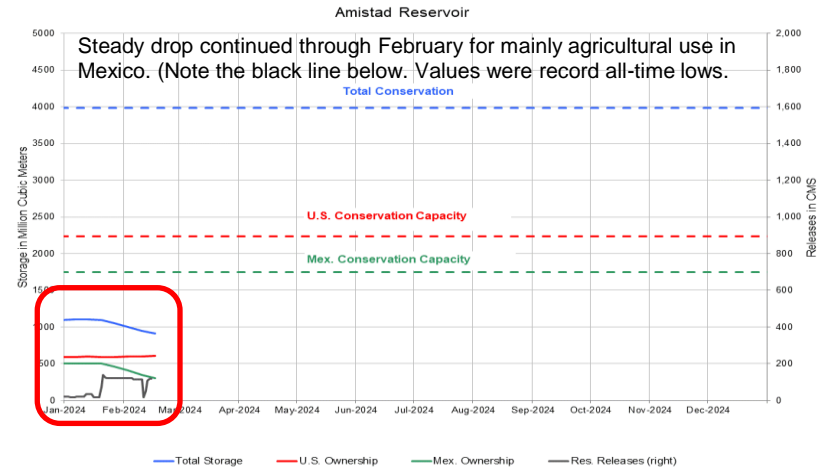
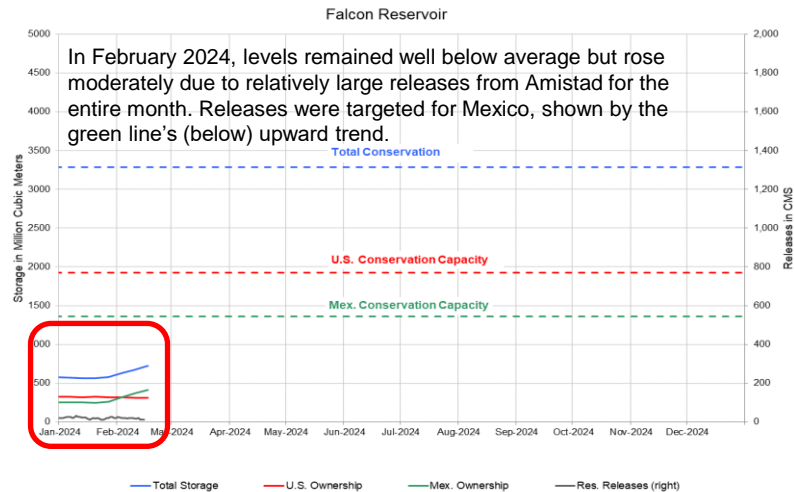
- Tenga cuidado de no arrastrar cadenas de remolque que podrían provocar chispas.
- No se estacione sobre césped seco.
- Evite las quemaduras al aire libre y revise las pilas recientemente quemadas para detectar brotes de fuego.
- Elimine la vegetación muerta alrededor de tu casa.
- Tenga cuidado soldar en hierba seca.



- ~50 in all (20 in Spanish)!
- Thanks to **Texas A&M Forest Service** for Many of These

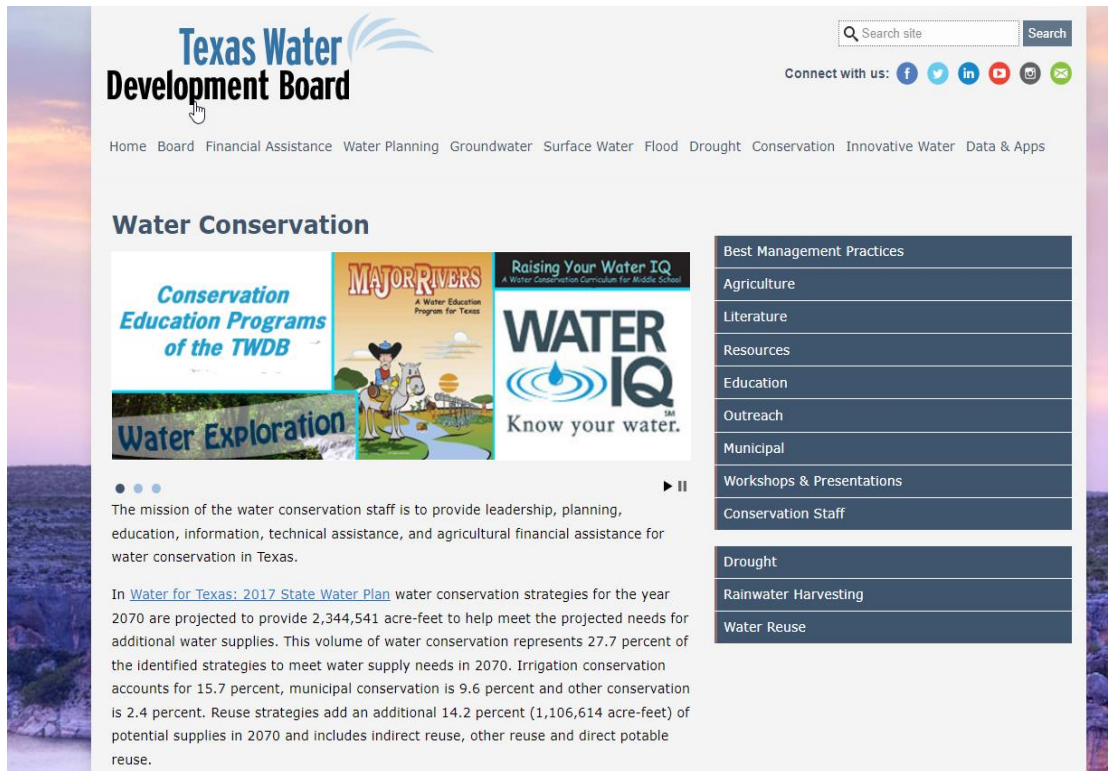


Amistad reached Record Lows; Releases edged Falcon Up



- Inflows through February (all from releases out of Amistad) allowed **Falcon** to rise from **17.5%** on January 26th to **23.9%** on February 27th. This level was slightly above 30-year lows. Additional inflows were likely into early March before reduction, with Falcon likely to reach **25%** before leveling off. Spring inflows from rain alone look unlikely, though **should thunderstorms develop over the Sierra Madre, values would hold near 25%**. Otherwise, any combination of releases out of Falcon with warm to hot and dry weather in late spring would resume drops, and **upper teens levels could return by May**.
- Amistad fell to all-time record lows in late February due to continued releases** targeted for Mexico. Levels dropped from **26.3%** on January 25th to **20.9% on February 27th**. The spring forecast strongly suggests **little to no inflows into Amistad while temperature and evaporation rates rise**. Without assistance, **levels are likely to fall into the upper teens by April and remain through May**.

Water Conservation is Key Until Further Notice!



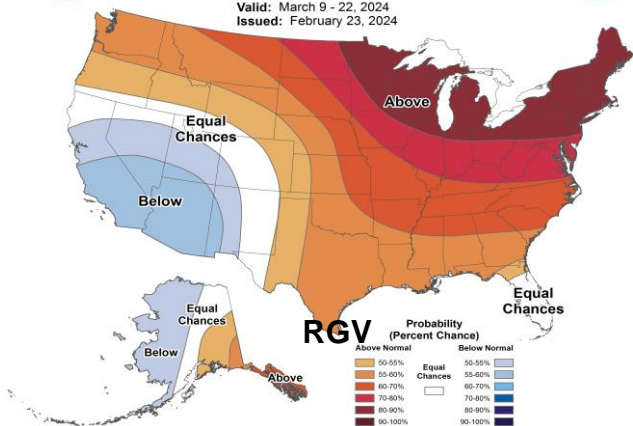
The screenshot shows the Texas Water Development Board (TWDB) website. The header includes the TWDB logo, a search bar, and social media links. The main navigation menu lists: Home, Board, Financial Assistance, Water Planning, Groundwater, Surface Water, Flood, Drought, Conservation, Innovative Water, and Data & Apps. The 'Water Conservation' section is highlighted, featuring three educational programs: 'Conservation Education Programs of the TWDB', 'MAJOR RIVERS A Water Education Program for Texas', and 'Raising Your Water IQ A Water Conservation Curriculum for Middle School'. Below these, there is a 'Water Exploration' video player. The text below the video states: 'The mission of the water conservation staff is to provide leadership, planning, education, information, technical assistance, and agricultural financial assistance for water conservation in Texas.' It also mentions that in the 'Water for Texas: 2017 State Water Plan', water conservation strategies for the year 2070 are projected to provide 2,344,541 acre-feet to help meet the projected needs for additional water supplies. This volume of water conservation represents 27.7 percent of the identified strategies to meet water supply needs in 2070. Irrigation conservation accounts for 15.7 percent, municipal conservation is 9.6 percent and other conservation is 2.4 percent. Reuse strategies add an additional 14.2 percent (1,106,614 acre-feet) of potential supplies in 2070 and includes indirect reuse, other reuse and direct potable reuse. On the right side of the page, there is a sidebar with a list of links: Best Management Practices, Agriculture, Literature, Resources, Education, Outreach, Municipal, Workshops & Presentations, Conservation Staff, Drought, Rainwater Harvesting, and Water Reuse.

- [“Stage 2” Restrictions](#) continued through winter and are likely to expand through spring, based on inflows from Amistad and Falcon.
- Learn more at the [Texas Water Development Board’s Conservation Page](#)

March 2024: Confidence: Low-Medium on Average Temperatures; Medium on Rainfall

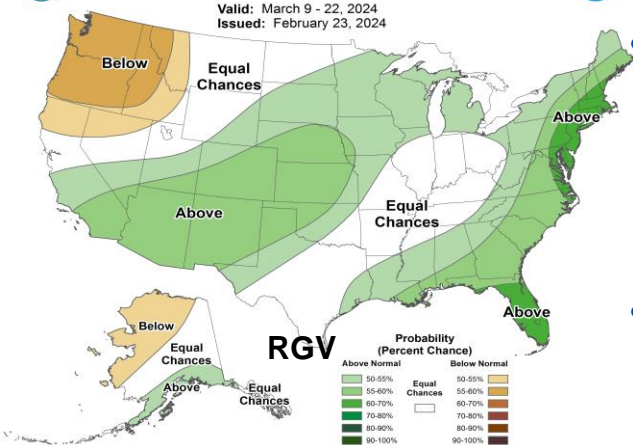
Weeks 3-4 Temperature Outlook

Valid: March 9 - 22, 2024
Issued: February 23, 2024



Weeks 3-4 Precipitation Outlook

Valid: March 9 - 22, 2024
Issued: February 23, 2024

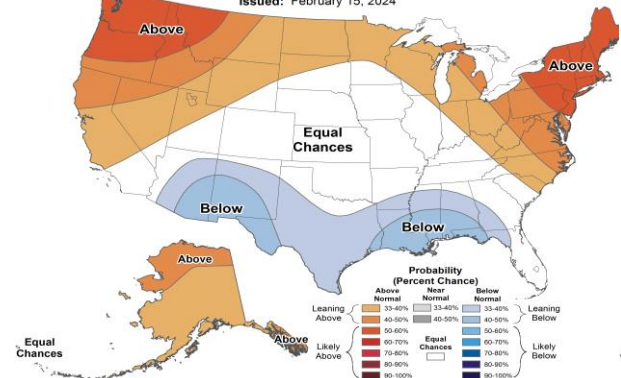


Bottom Line: The pattern is beginning to lean warm and dry, with weak fronts and the potential for some light rain early, and an outside chance for thunderstorm clusters after March 15th.

Confidence in the rainfall forecast is **medium** for March. Though the forecast may lean dry, the opportunity for a shower/thunderstorm cluster event in late March **could quickly push values above monthly averages** (Around 1 inch). Conversely, “dry” fronts could push moisture away and be followed by up to ten days of dry air, reducing monthly rain to below average.

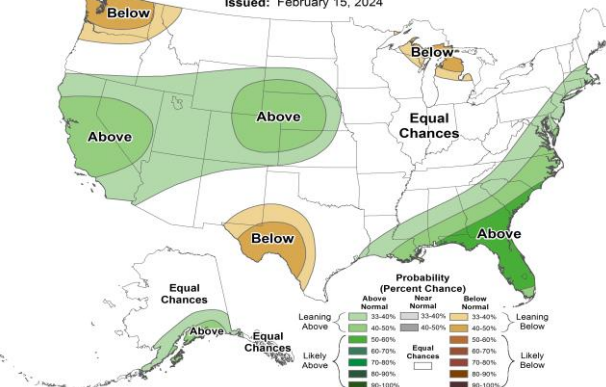
Monthly Temperature Outlook

Valid: March 2024
Issued: February 15, 2024



Monthly Precipitation Outlook

Valid: March 2024
Issued: February 15, 2024



Late Spring through Late Summer 2024: Dryness and Heat Becoming More Likely



Seasonal Temperature Outlook

Valid: Apr-May-Jun 2024
Issued: February 15, 2024



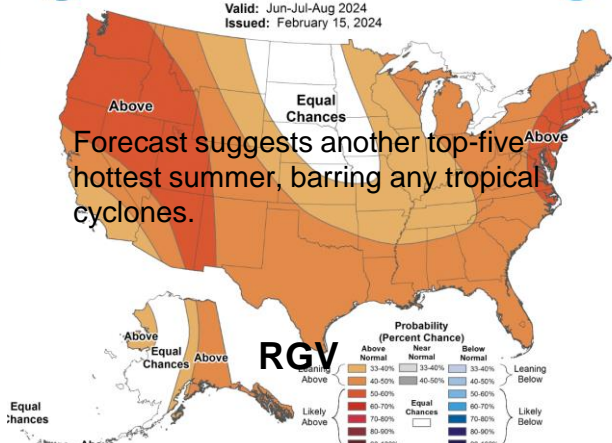
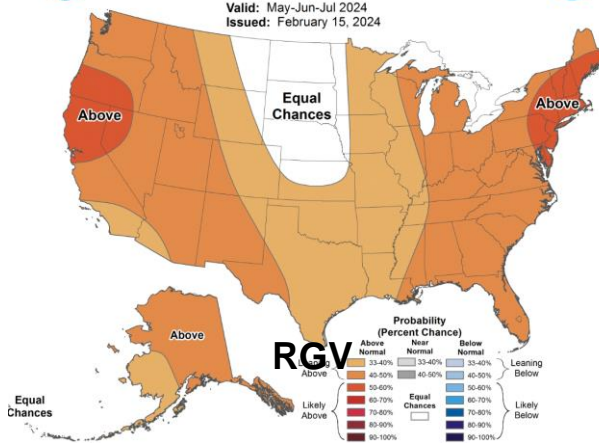
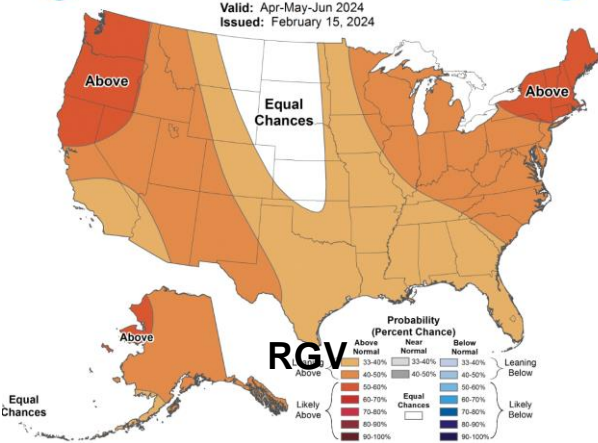
Seasonal Temperature Outlook

Valid: May-Jun-Jul 2024
Issued: February 15, 2024



Seasonal Temperature Outlook

Valid: Jun-Jul-Aug 2024
Issued: February 15, 2024



Seasonal Precipitation Outlook

Valid: Apr-May-Jun 2024
Issued: February 15, 2024



Seasonal Precipitation Outlook

Valid: May-Jun-Jul 2024
Issued: February 15, 2024



Seasonal Precipitation Outlook

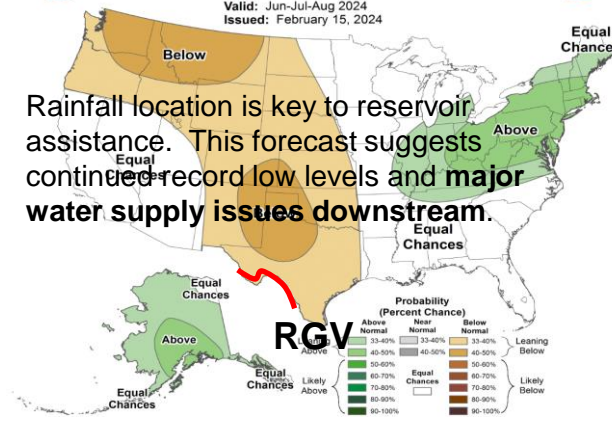
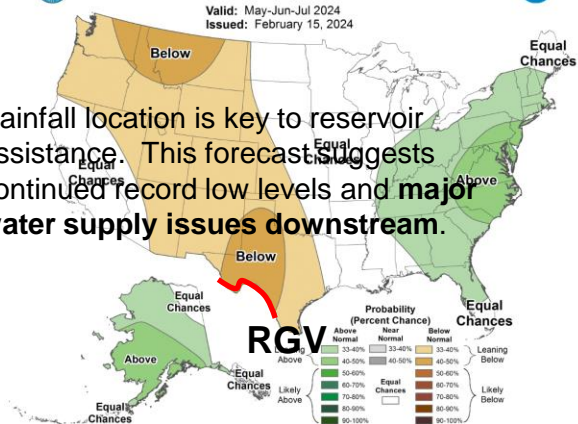
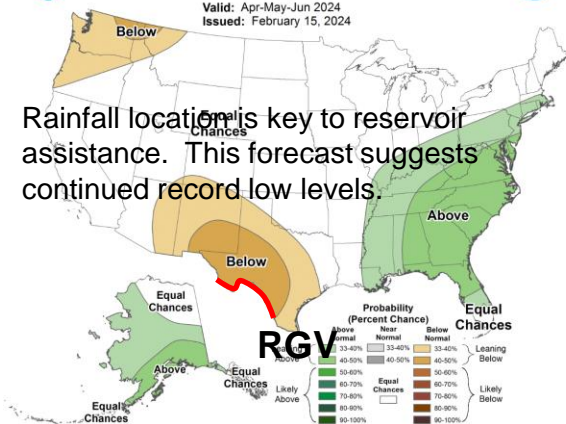
Valid: Jun-Jul-Aug 2024
Issued: February 15, 2024



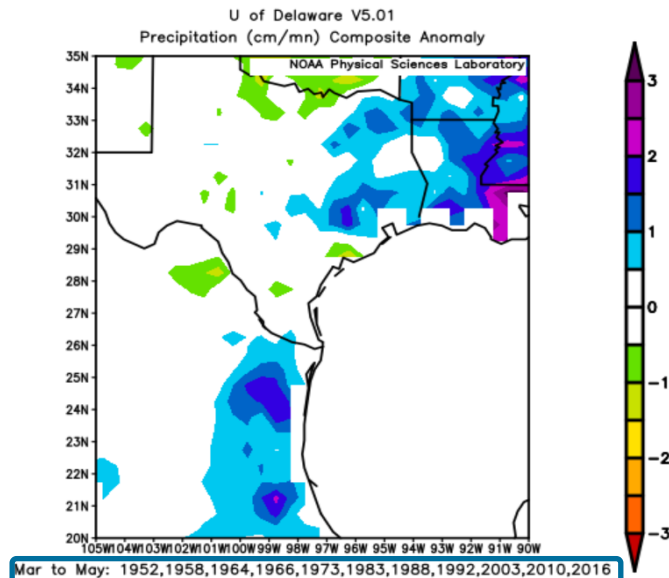
Rainfall location is key to reservoir assistance. This forecast suggests continued record low levels.

Rainfall location is key to reservoir assistance. This forecast suggests continued record low levels and **major water supply issues downstream.**

Rainfall location is key to reservoir assistance. This forecast suggests continued record low levels and **major water supply issues downstream.**

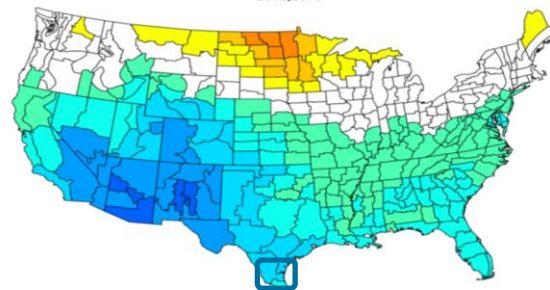


Comparing Similar El Niño Episodes; March-May Periods

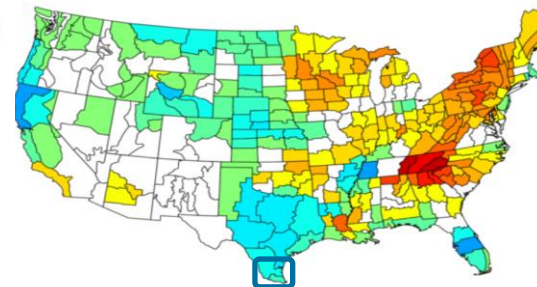
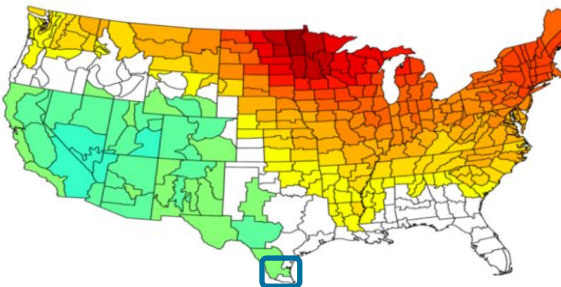
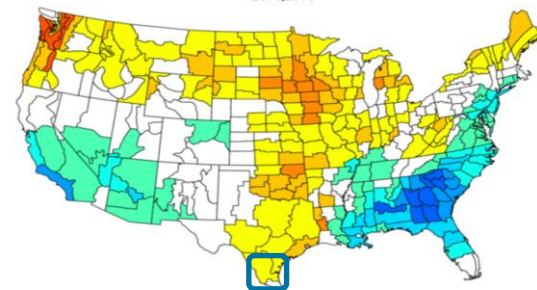


Composite departure from average rainfall for years where the Oceanic Niño Index (ONI) increased to moderate (1 to 1.4), strong (1.5 to 1.9), or "super" (≥ 2.0) levels prior to the March-May window.

NOAA/NCEI Climate Division Composite Temperature Anomalies (F)
Versus 1991–2020 Longterm Average
Mar to May 1952,1958,1964,1966,1973,1983,1988,1992,1998,2003
2010,2016



NOAA/NCEI Climate Division Composite Precipitation Anomalies (in)
Versus 1991–2020 Longterm Average
Mar to May 1952,1958,1964,1966,1973,1983,1988,1992,1998,2003
2010,2016



- **Top:** Composite temperature (left) and precipitation (right) anomalies for moderate/strong/"super" El Niños leading into March-May, since 1950.
- **Bottom:** Same, except for most recent cases (2009/10 and 2015/16).

Bottom Lines

- Sufficient inflows from Mexican reservoirs serving the Lower Rio Grande watershed remain unlikely during the March-May 2024 period. **Combined share of water in Amistad and Falcon now likely to continue well below Stage 2 triggers (25% or less) through May.** Water conservation, smart irrigation, and rainwater harvesting are critical actions to continue. A water crisis by early summer is a reasonable worst-case scenario for agriculture and some municipalities.
- **Drought Is likely to develop across the Rio Grande Plains/Brush Country as early as mid to late March** and spread into the **mid/upper Valley by April.** Drought development is predicated on limited to no area-wide **thunderstorm events; multiple events would slow or hold off worsening drought.** Prolonged spells of **warm to eventually hot weather** with low humidity would bring **severe (Level 2 of 4)** drought as early as April. Confidence is leaning this direction. The **Rio Grande Plains could reach extreme (Level 3) in May.** The combination of increasing heat (evaporation) and very limited water releases would have **major impact on the crop and livestock industry.**
- The expectation that El Niño will quickly turn neutral in spring, and possibly flip to La Niña by late spring and early summer, could be a harbinger of wildfire spread potential – after any early “greenup” is rapidly eliminated by increasingly warm/hot and dry weather. **April-June would begin a critical period.**
- **Severe Weather? Late March through mid May** offers the best opportunity, as surface temperatures warm with the sun and instability could increase. However, *much would depend on an active subtropical jet stream linking up with stronger mid-latitude systems.* **A drier pattern, especially in April, would reduce opportunity.** Because of these factors, **confidence is low.** Typical threats would be **hail**, followed by **damaging wind** and **flooding rain**

