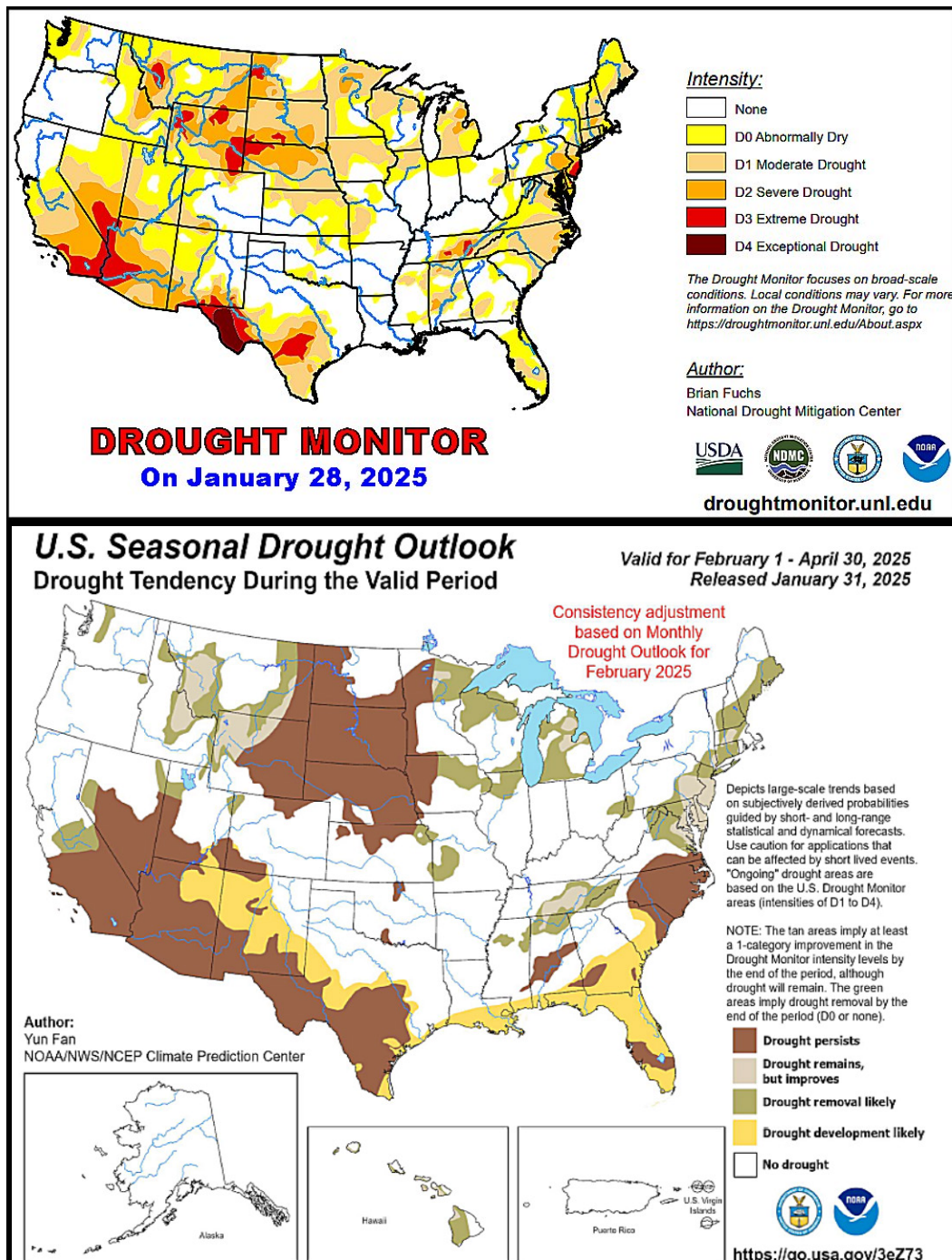


2025 Weather Outlook Series: North America Spring

By Drew Lerner

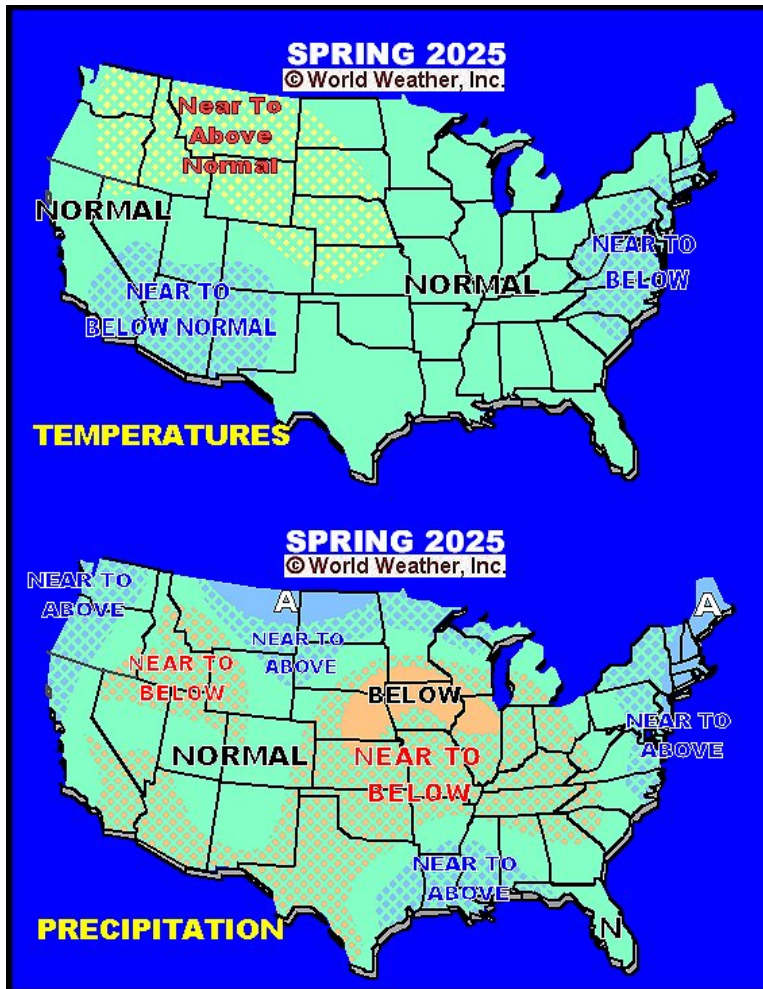
Kansas City, February 6 (World Weather Inc.) – As noted in part one of this 2025 Weather Outlook Series, there is good potential that weather coming into spring 2025 will be drier biased in a portion of the Great Plains, upper Midwest and southwestern desert region into northern Mexico. Canada's Prairies will come into spring with some hope of improved weather after winter precipitation was favorable and some areas will have significant snow to melt as seasonal warming begins.



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Spring in North America will still be dominated by the two weather patterns noted in part one of this series of outlook articles. The “Pattern Two” upper air wind flow is the one that is going to present the greatest concern for crops in the Midwest, Delta and southeastern states because of the potential for cold air outbreaks after periods of warm weather. It is hard to perceive at this point in time, but there is potential for **multiple bouts of cold air** in the eastern parts of North America during spring. March will be most favored for this with April possibly turning much warmer. However, some cooling may return later in the spring. This may create a near normal average of temperatures for the March through May period, but there will be enough cold air around to frustrate many and some of it may impact crop development. The April warm up will be of great interest because it will stimulate new crop development in the southern and central United States and if it lasts long enough crops could become well advanced. There is potential for some late season cold surges that might threaten those crops that are most advanced. For now, that is just speculation, but the situation will be closely monitored.

2007 is one of the lunar cycle years for 2025 and in that year bitter cold air plunged southward into the central and eastern U.S. inducing the April 5 Easter freeze event that damaged many crops. We have already seen some parallels to 2007 as well as other lunar cycle years and a damaging freeze cannot be ruled out as a possibility, although an exact repeat of the April 5, 2007 event is highly unlikely.



Temperatures in the spring should heat up well in the Plains and western United States during April, but if significant precipitation has not fallen by that time there may be some concern about crop moisture and plant stress in the high Plains region especially in hard red winter wheat areas. During those warmer days in April, the potential for rain in the upper Midwest and northern Plains as well as southern Canada's Prairies will be rising. There will be an important window of opportunity for timely rain in these areas and if that opportunity is missed there could be a greater potential for dryness issues later in the growing season. Confidence is rising, though, for a potential for rain and it may continue into May and June, but the potential for this rain may be

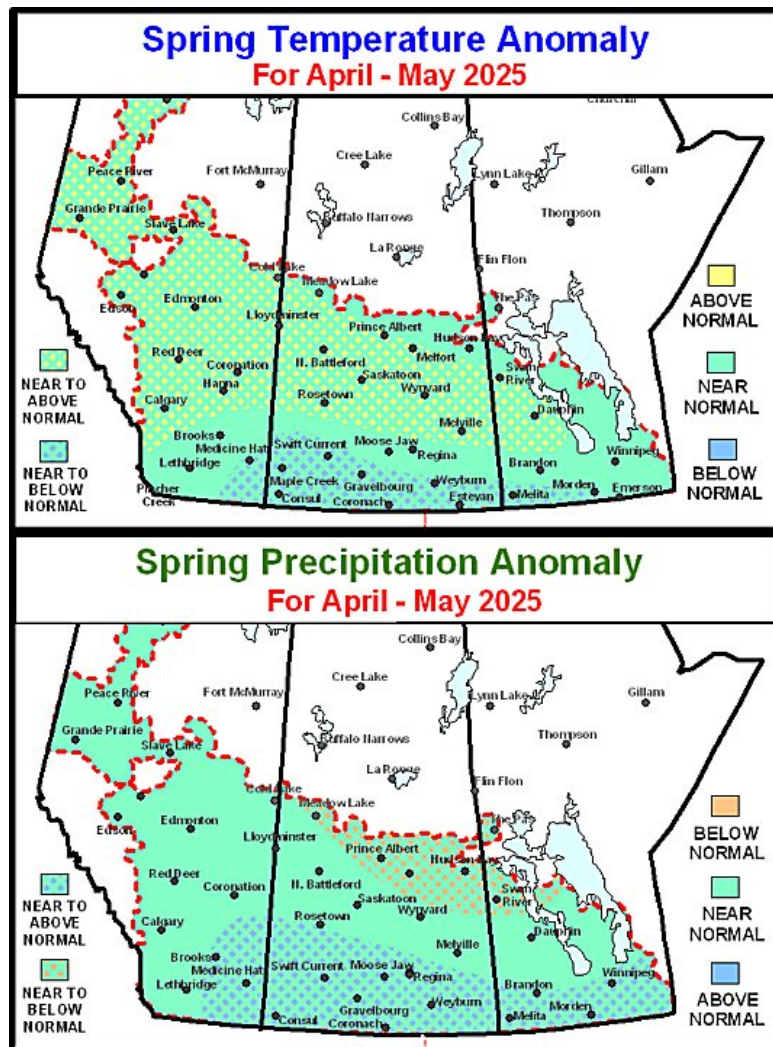
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greatest in the northernmost Plains, uppermost Midwest and southwestern Canada Prairies. There is potential for some heavy and frequent rain in some of this region that could result in planting delays.

A little farther to the south in Iowa, southern Minnesota, Nebraska and immediate neighboring areas have potential to be missed by some significant precipitation during the spring. A complete miss is unlikely, but the window of opportunity for repetitive rain events will be more narrow than usual. A few very important rain events will move through the western Corn and Soybean production areas during early to mid-spring that will produce enough moisture to begin planting; however, moisture deficits lingering from the autumn

and winter dryness will not be fully eliminated. This will lead to fast spring planting in a part of the western Corn and Soybean Belt, but there will also be some concern over field moisture to support crops as seasonal warming evolves.

There is a good potential that mid- to late spring precipitation will be abundant in the northern Plains, a part of Canada's Prairies and the far northern parts of the upper Midwest. To the south of this region there may be some ongoing moisture deficits and rainfall will be lighter than usual. This could result in a threat to some of the western Midwest and a part of the Great Plains if temperatures turn warmer than usual too soon in the spring and early summer. Dryness may help get spring planting completed early, but there may also be some concern about crop



development during the warm season if the moisture deficits are not eliminated prior to summer.

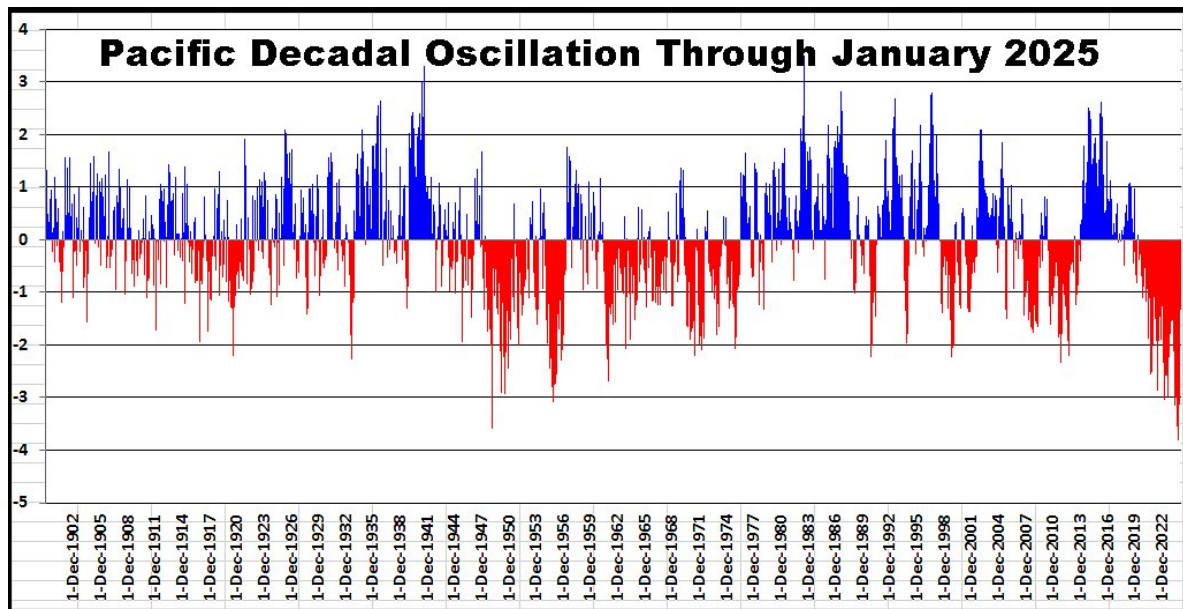
A little farther to the east in **the eastern Midwest and southward into the Delta and interior southeastern states** there is likely to be a more routine occurrence of rainfall that will leave those areas poised for a favorable start to the growing season. That will contrast with the western Midwest and part of the central Plains where concern will prevail over sufficient moisture to counter evaporation and support winter wheat development and early spring crop emergence and establishment.

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There is some concern for a short term period of excessive rain in the central Gulf of Mexico Coast States during a part of spring. With the cold weather expected in March the most favored period for that wet bias may be March and early April which could delay the onset of spring planting for some areas. Once warming occurs in the central United States the wet bias in the mid-south region should begin to abate.

In the meantime, dryness in **South Texas and the Coastal Bend** will likely abate during March as cold high pressure dropping into the Mid-South region of the nation should push warm, moist air from the Gulf of Mexico into the southeastern Plains which should help to induce some abundant planting moisture. Farther to the west, though, dryness may prevail in **West Texas** unless the cold high pressure systems in the Mid-South region are relocated a little farther to the west then feedback moisture from the Gulf of Mexico could be sent more to the west than the most likely scenario.

PACIFIC DECADAL OSCILLATION



Pacific Decadal Oscillation		
Date	PDO	
January 2025	-1.32	Rising Index Values
December 2024	-2.04	
November 2024	-3.13	
October 2024	-3.80	
September 2024	-3.56	
August 2024	-2.91	
July 2024	-3.00	
June 2024	-3.15	
May 2024	-2.98	
April 2024	-2.11	

The strongly negative Pacific Decadal Oscillation and lingering early spring La Nina biases may promote stronger than usual ridge building aloft over the U.S. Great Plains and/or Rocky Mountain region. Such a feature evolving after winter precipitation was poor in the region could lead to a more significant high pressure ridge aloft that might suppress rainfall and accelerate drying rates leading to crop moisture stress from the southwestern Plains into the western Corn and Soybean Belt and much of the central and southwestern Plains.

The negative PDO that has prevailed since 2020 could be a significant factor to spring weather this year. Storm systems coming into the northwestern U.S. may impact the Pacific Northwest most often sending waves

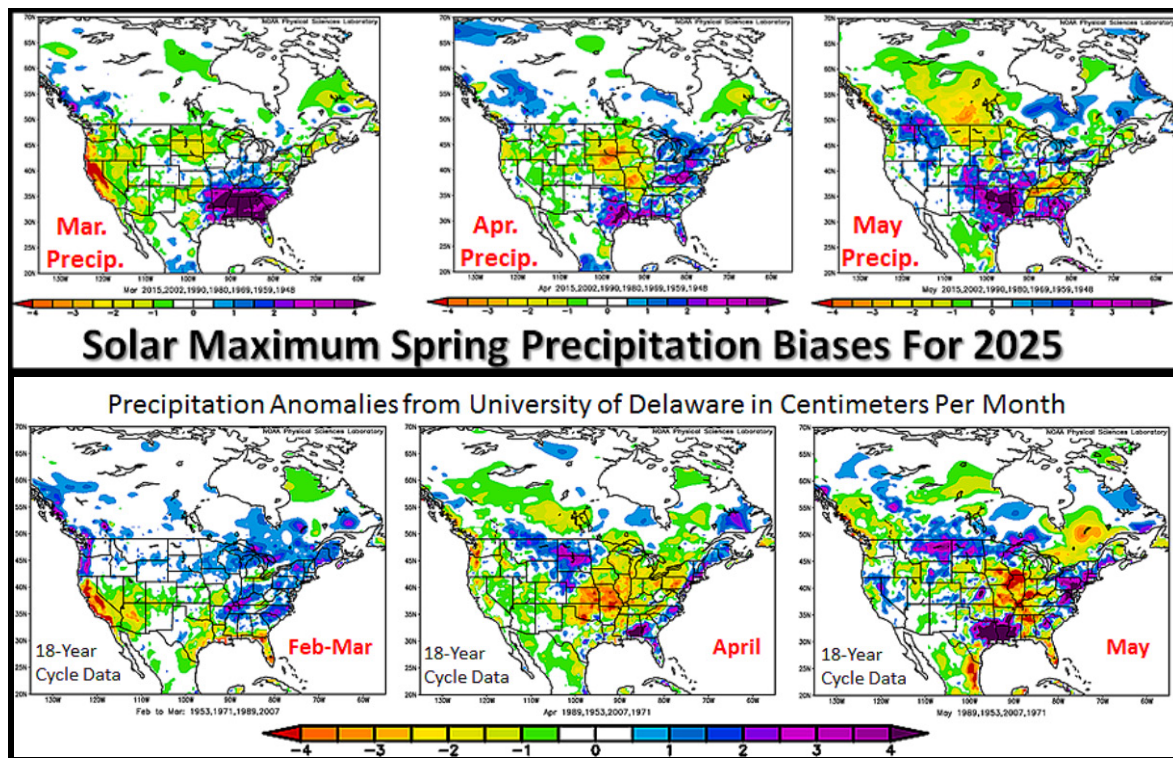
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of rain inland. The pattern could lead to greater ridge building in the middle of North America especially since the lunar cycle will be promoting deep troughs of low pressure over eastern North America.

The lunar cycle is already promoting a high pressure ridge over a part of central and interior western North America this spring and the negative PDO pattern will want to shift this feature farther to the east possibly resulting in more dry and warm weather in the already drier biased areas of the western Midwest and Great Plains. This is a setup that has induced drought conditions in the western and central Midwest in past episodes of similarity. However, *the PDO index has been rising aggressively possibly suggesting a change later this year which leaves the influence of PDO a little unclear.*

This area in central North America should be watched most closely during the April through June period because of the potential for dryness in the central and southern Great Plains and western Midwest and the possible development of surplus to excessive moisture in a part of Canada's Prairies and the northern U.S. Plains. The eastern U.S. Midwest, Delta and southeastern states will continue to deal with alternating periods of rain and sunshine that should prove favorable for spring and winter crop development.

THE SOLAR AND LUNAR CYCLES



La Nina should dissipate in early spring and the negative PDO should be steadily weakening at that time. The solar maximum may also play a role on spring weather this year. Spring seasons that follow the maximum number of sunspot numbers in a particular solar cycle (which may have occurred in August 2024) usually present more routine rain events in the central and eastern parts of North America. That could translate into less dryness in the Plains and western Midwest. The lunar cycle and neutral ENSO conditions

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should dominate the weather during spring, but each of these weather parameters must be viewed together to determine spring weather.

Spring weather should not be ideal, but World Weather, Inc. anticipates some excessive moisture issues in a part of the far northern Plains and southern Canada Prairies while the western Corn Belt (centered on Iowa) is drier biased with quick planting progress. Areas farther to the east should see a relatively normal progression in spring planting and early season crop development, although there will be a few bouts of excessive rain.

Southern California, the southwestern desert region and northern Mexico will remain in drought, although there will be a few storms that push through the region in early spring offering some short term moisture improvements. **Far eastern Canada crop areas** should be a little drier and cooler than usual. The southwestern Plains will be caught up in some of the drier biases brought on by departing La Nina and weakening negative PDO, but there is potential for better rain in time for cotton and sorghum planting and for the reproduction of winter crops. The **central and southwestern Plains** will not be ideally treated with precipitation, though sufficient amounts may occur to support fieldwork and crop development even if that process is a little stressed at times.

As long as there are no damaging cold air outbreaks in the spring, most of the anomalous weather noted above will have low impact on summer crop production, although concern about dryness in the western Midwest and too much rain in Canada and the northern U.S. Plains will require some close monitoring.

SUDDEN STRATOSPHERIC WARMING

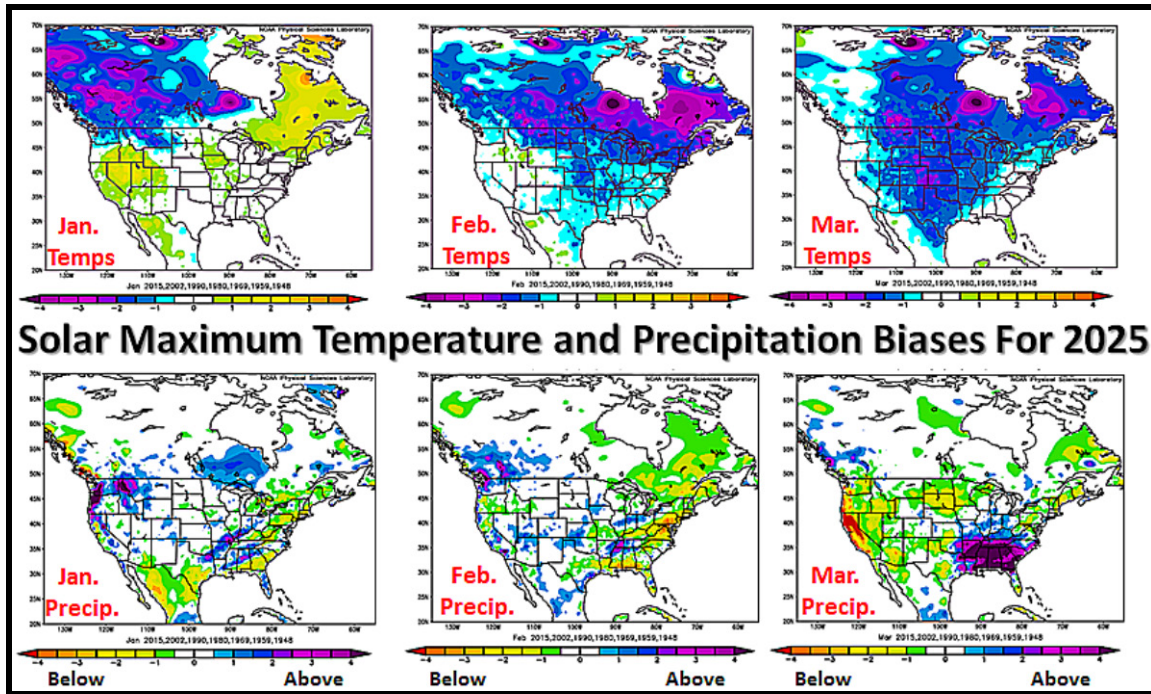
One last note that must be made is in regard to the Sudden Stratospheric Warming that is under way. This warming in the stratosphere may induce more cooling in the troposphere (where we live) over North America and possibly in a part of Europe. The North America cooling is most likely because of the general weather pattern that has already been in place. The “Pattern Two” weather pattern that we presented on our late winter discussion is due to resume in another week. That pattern will attempt to bring colder air from the arctic into central North America and eventually to the eastern parts of the continent. Our temperature forecast for spring is near normal but that was an average of expected temperatures that would be well below normal in March and above normal in April with some near to below normal conditions possible again in May.

The developing stratospheric warming event may split the polar vortex and allow one of its centers to locate over northeastern North America. This event would reinforce our already expected cold bias in the United States during March. It would also bring some significant snow to the southeastern and middle Atlantic Coast areas of the United States after sending some snow across the central states.

What makes the stratospheric event so interesting is its melding and reinforcing properties of the cold weather bias that is already slated for North America. In addition to that, both weak La Nina events and the winters following a solar maximum also reinforce this bias. World Weather, believes with or without the polar vortex March and late February will be colder than usual in at least a part of North America.

Even though this discussion is largely committed to spring 2025, it is very important to see how a stratospheric warming event now would reinforce the late winter bias for cold weather in North America that already shows up because of the solar maximum and lingering weak La Nina events.

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