

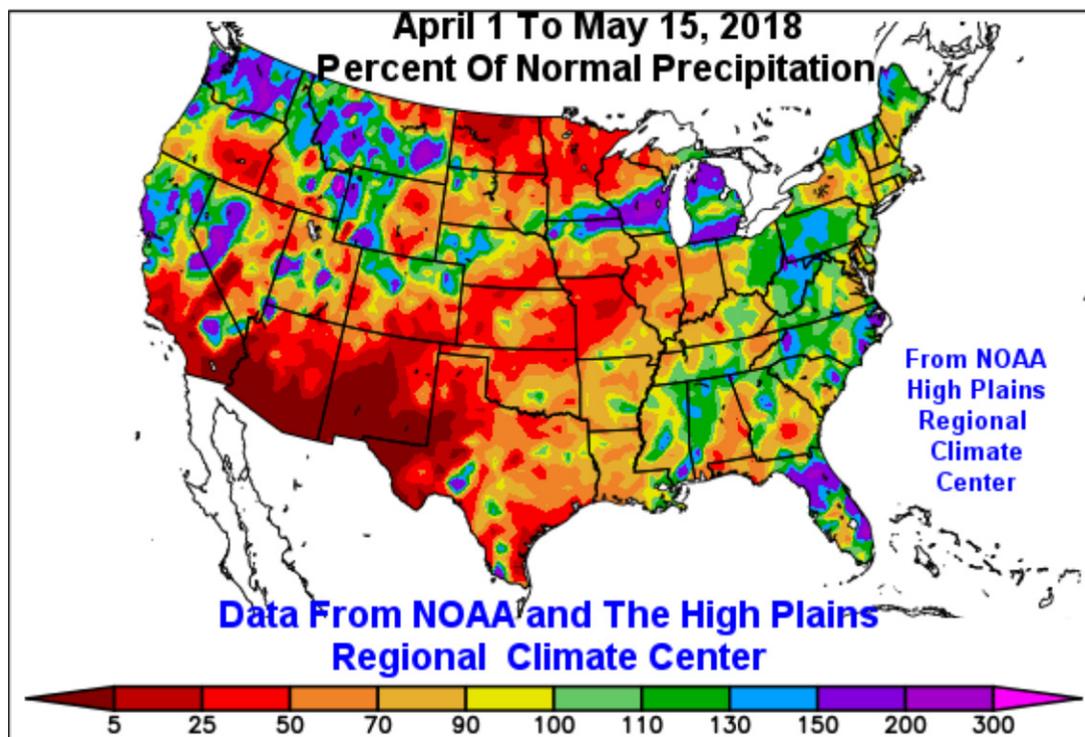
Assessing North America Summer Weather In Detail

By Drew Lerner

Kansas City, May 16 (World Weather Inc.) – It seems logical at mid-May while at the threshold of summer to take a minute and assess the weather’s role in field progress and crop development thus far in the North American growing season and then revisit the trends that should guide us into the future of summer weather. [This article is designed to lay out the facts that have gotten us in the current state of soil moisture and anomalous weather and reassess the outlook for the next few months. There are some very interesting trends that need to be noted which will make this a long read, but the conclusion at the end should give us a better target of expectations for the summer growing season that lies ahead.](#)

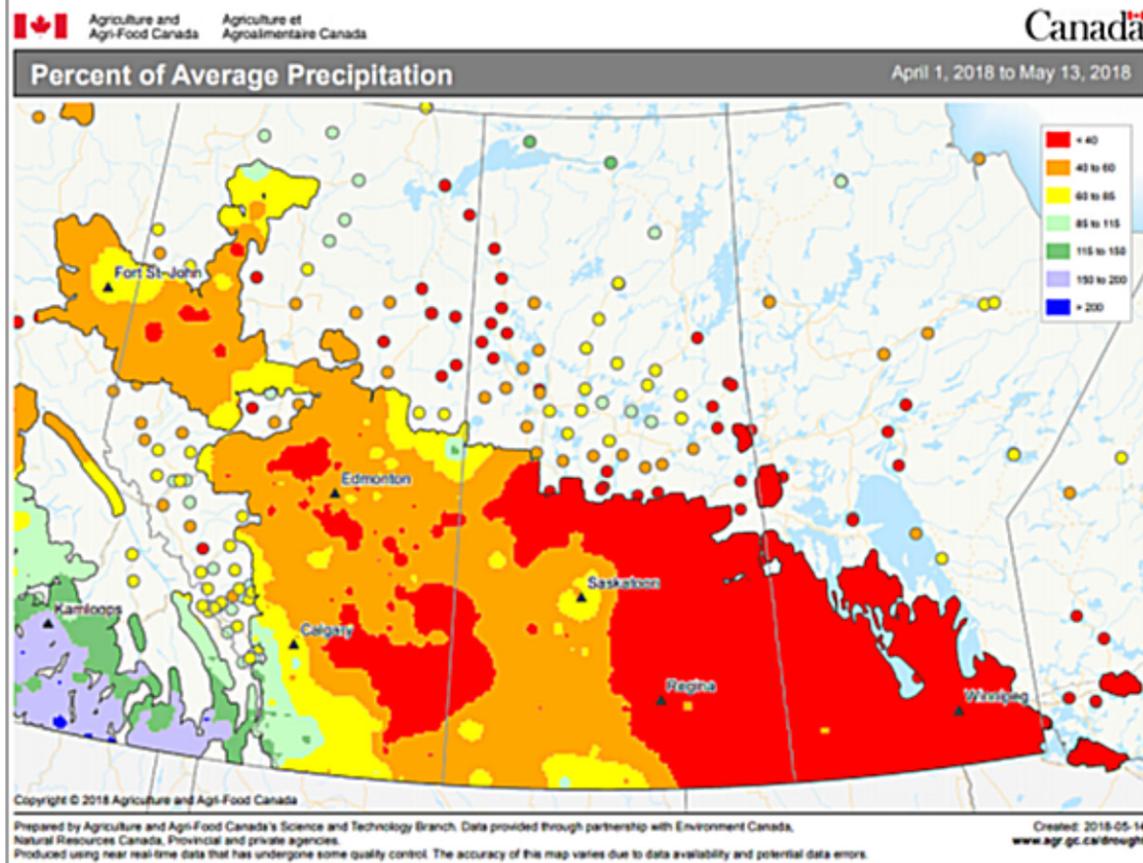
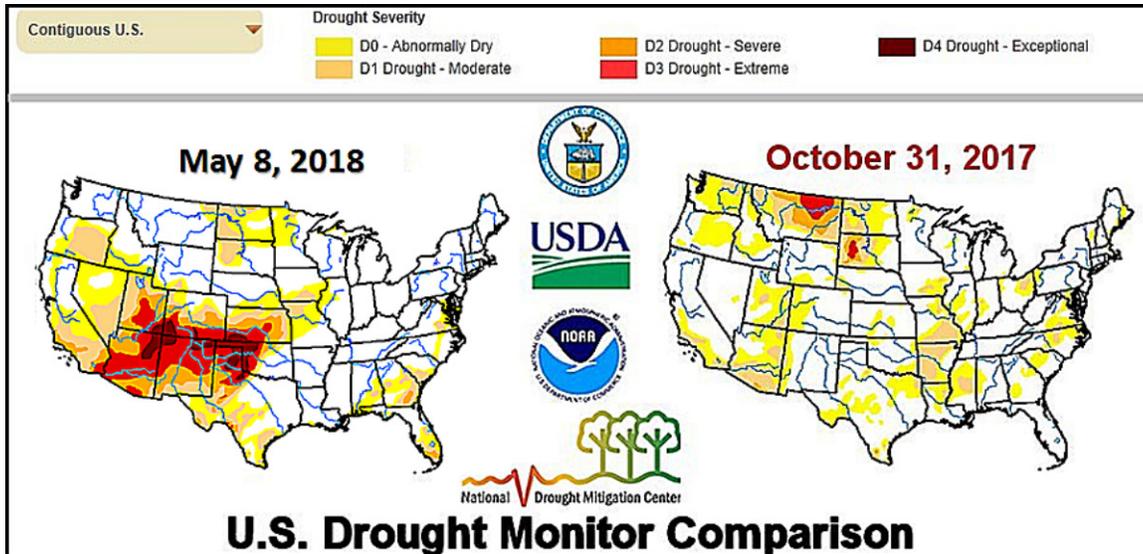
CURRENT STATUS

UNITED STATES: Moisture totals relative to normal since April 1, 2018 (roughly 6 weeks ago) has been lighter than usual in the northern Plains and in much of Canada’s Prairies. Well below average precipitation also occurred from the heart of the Midwest into the central and southern Plains and throughout the southwestern United States. The area is huge, but recent rain has brought timely relief to many of these areas.



Wetter biased areas over the entire six week period have been limited in size and number. Areas from the Pacific Northwest into Montana and parts of Wyoming have been wetter biased along with northern California, western Nevada and a few areas in the interior eastern United States and in Florida. However, in the case of Florida most of the wet weather has occurred quite recently and precipitation was well below average through April.

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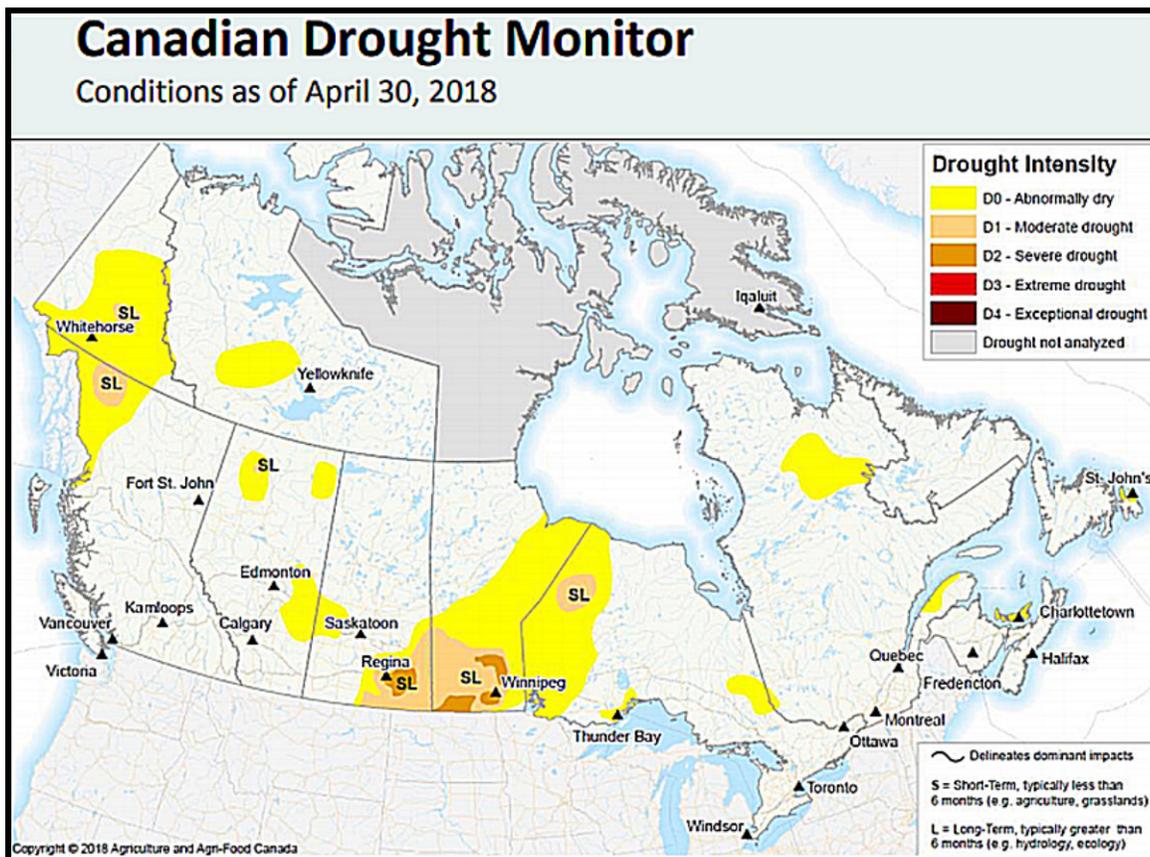


Drought in the United States actually developed and intensified during the late autumn and winter in the southwestern United States extending from the southern Great Basin and southwestern desert region across West Texas, northwestern Oklahoma and parts of Kansas to southern Iowa and northwestern Missouri on May 8. Drought intensity in the northern Plains that lingered last autumn was further diminished, although recent weather has been dry enough from northern Montana to northern Minnesota to raise worry over a resurgence of drought conditions.

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Drought that evolves during the winter season is usually a significant event since it is in the winter that most droughts are put down. Winter precipitation and temperatures normally bring moisture improvements rather than the development of drought. Dryness in the U.S. Delta last autumn was put down, but portions of the region have dried down relatively significantly in the past week.

Canada's Prairies have been notably drier than usual since the first of April with emphasis on Manitoba and eastern Saskatchewan where less than 40% of normal precipitation has occurred. Other pockets of extremely dry conditions were also noted in portions west-central Saskatchewan and eastern Alberta. *Last year's severe drought that impacted southern and east-central Saskatchewan and some areas of southern Alberta seems to have relocated more into southern Manitoba and southeastern Saskatchewan.*

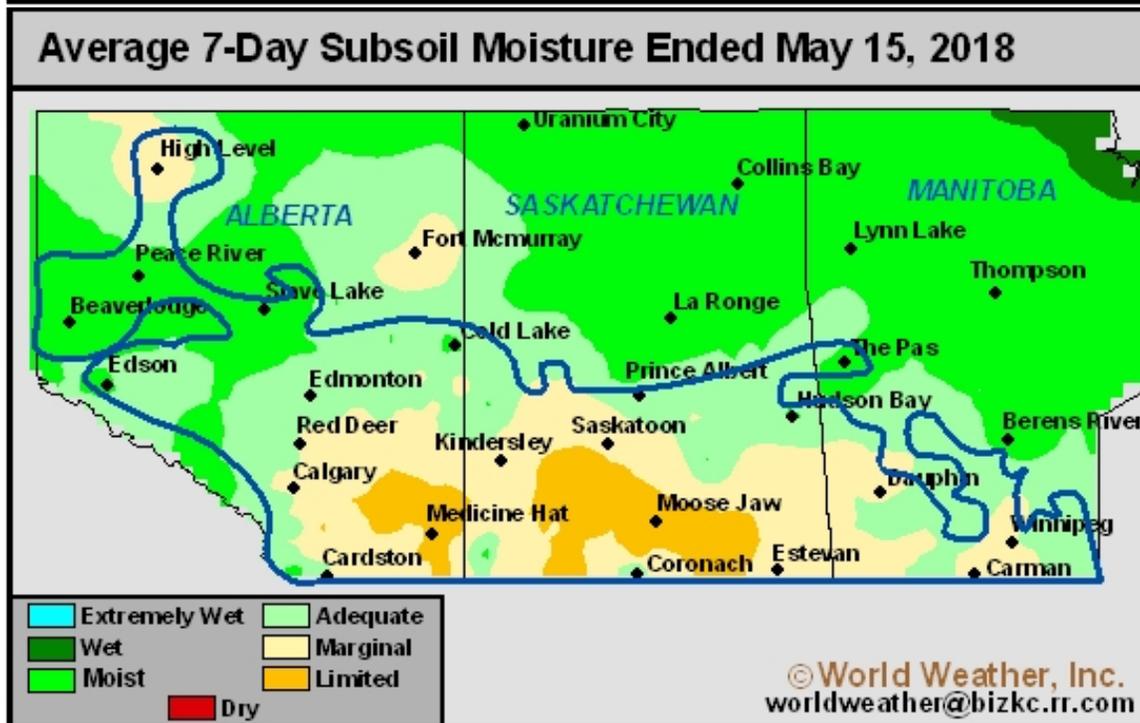
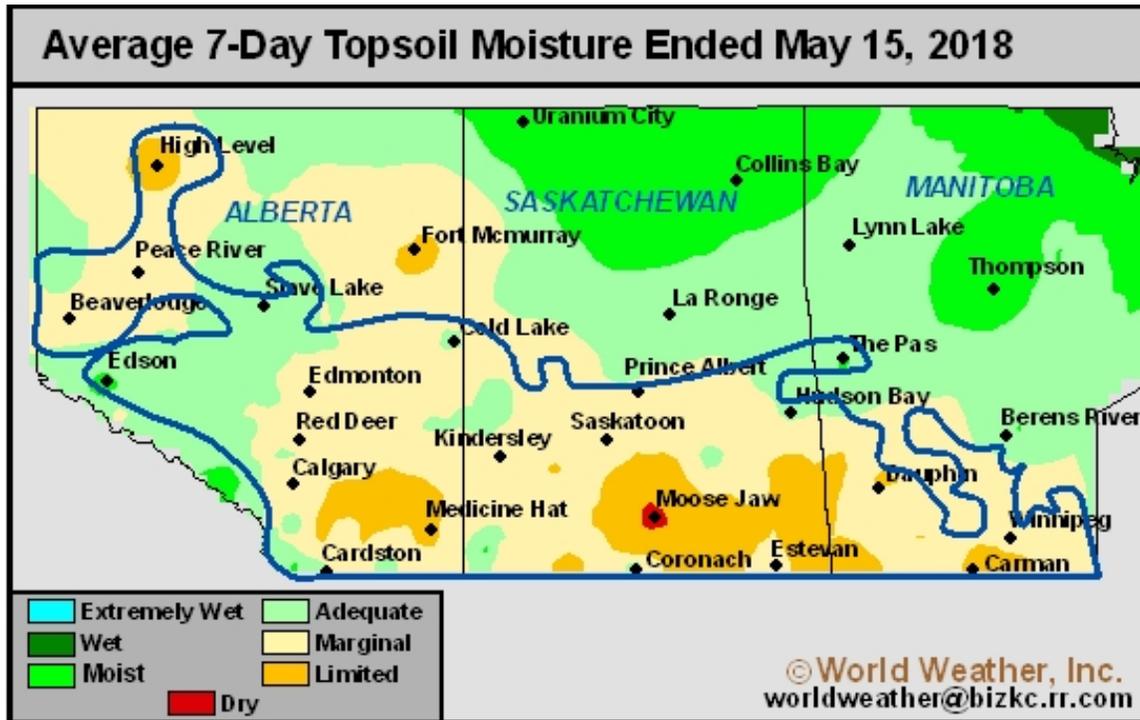


However, with that said about Canada's drought, there is still a large part of the central and eastern Prairies suffering from low subsoil moisture and that has many producers concerned about the long term outlook for crops in the Prairies. The past six weeks of well below average precipitation in the Prairies has resulted in topsoil moisture declines, especially in the past few weeks following the snow melt season.

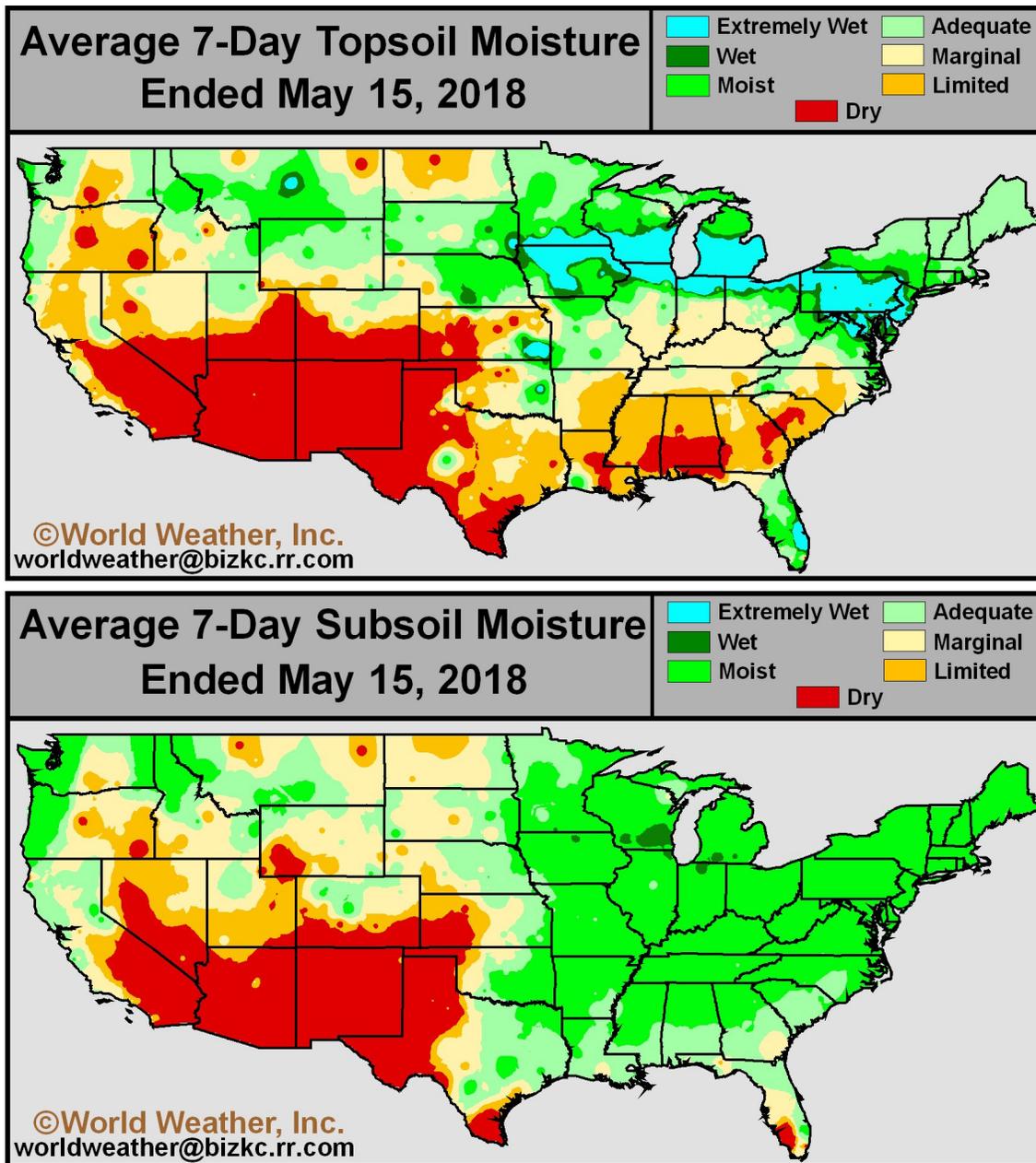
Topsoil moisture in the Prairies was abundant when snow finally melted in mid- to late-April. Substantial frost in the ground at that time left much of the melted snow standing around in fields until frost left the region. Frost dissipated in many areas during the first half of May and producers and analysts have been surprised at how quickly the moisture situation in Canada has gone from too wet to quite dry in the top few inches of soil. The

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[situation is common in southern and eastern Alberta and across many areas of Saskatchewan into Manitoba.](#) Most of the drying has been in the top few inches of soil, but with this being [the planting season it is not a good time for topsoil moisture to be depleted.](#) Subsoil moisture in many areas across the Prairies is also low following the drought of 2017 that took moisture surpluses from 2016 and exhausted them after months of restricted precipitation and warm weather.



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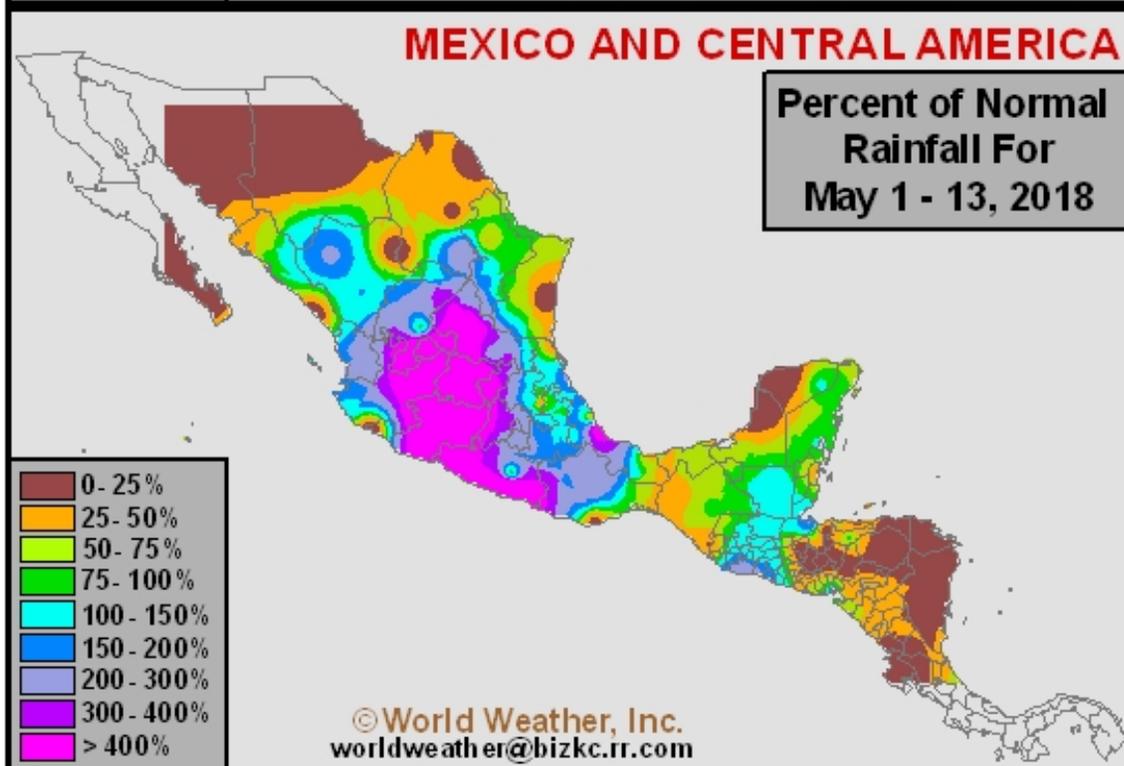
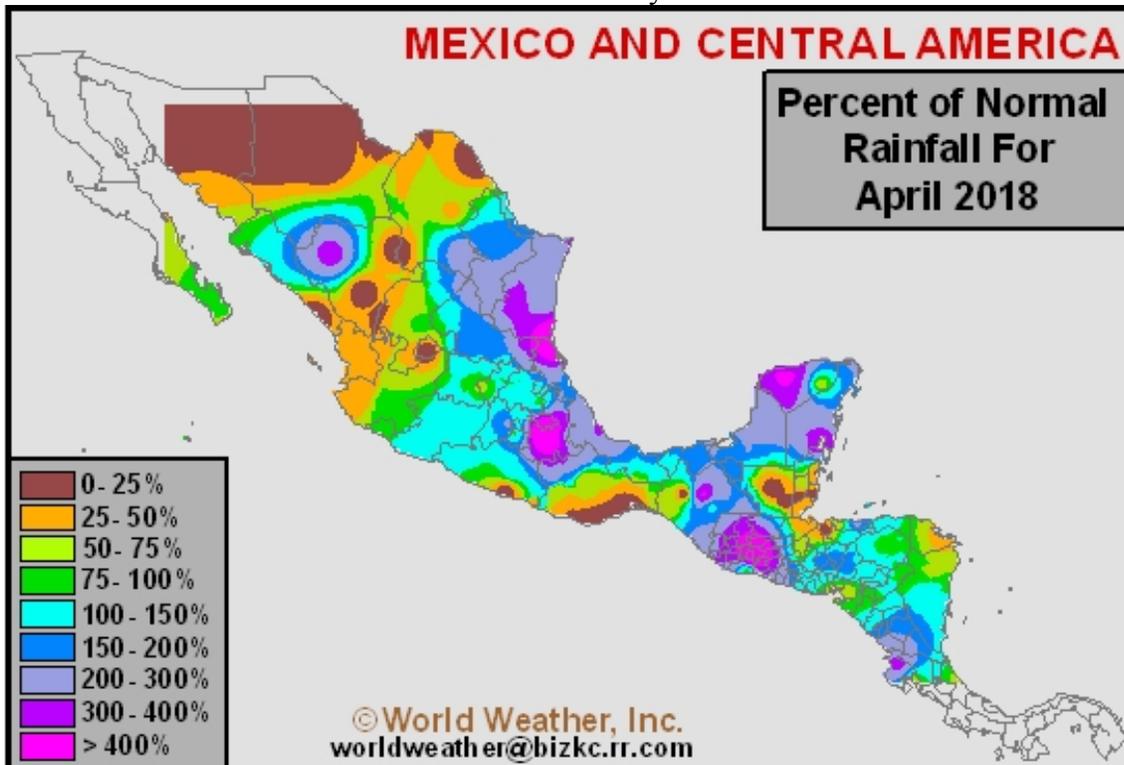


U.S. topsoil moisture on May 15 was rated the worst since the same time in May 2012, which later became a serious drought year. There have been other years in which mid-May was dry like this and it did not lead to severe drought, but it is interesting to note when the last dry mid-May occurred.

Worry has increased in many areas across North America from northern Mexico into Canada's Prairies about the huge area that is reporting dry or drier than usual conditions. There have already been many predictions of huge wildfire and forest fire potentials for 2018 because of dry tender from northern Mexico through the southwestern U.S. desert region and southern U.S. Rocky Mountain region and also in portions of the Canadian Prairies.

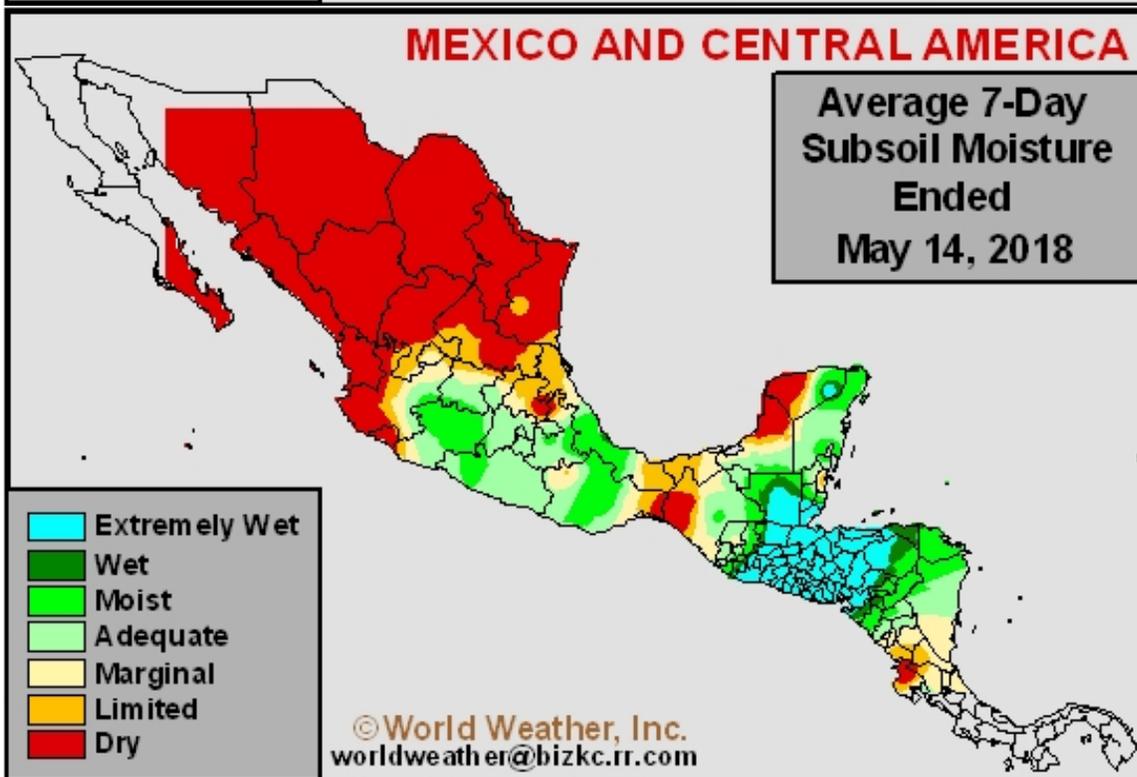
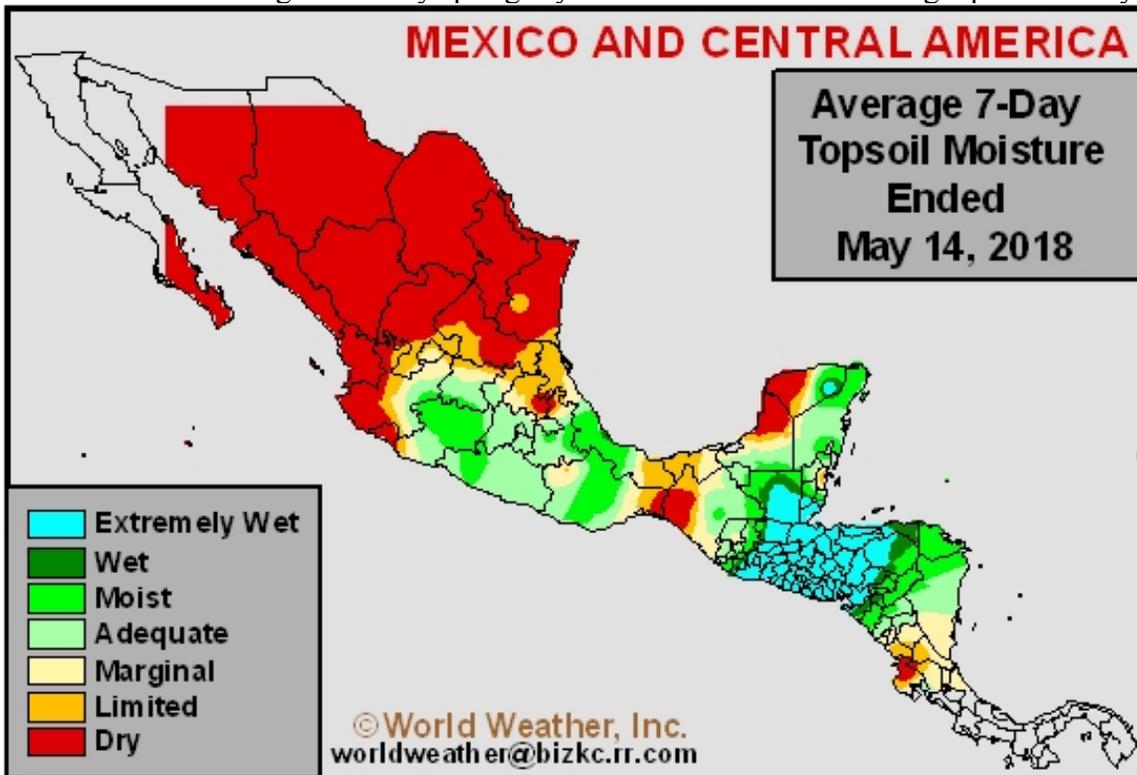
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Mexico's dryness has been mostly confined to northernmost parts of the nation, but rainfall has been well below average since last autumn because of the La Nina event that prevailed during the autumn and winter months. Soil moisture in those areas is also quite low with some water supply below average and concern about ongoing dryness in the region until the monsoon season arrives in late June and July.



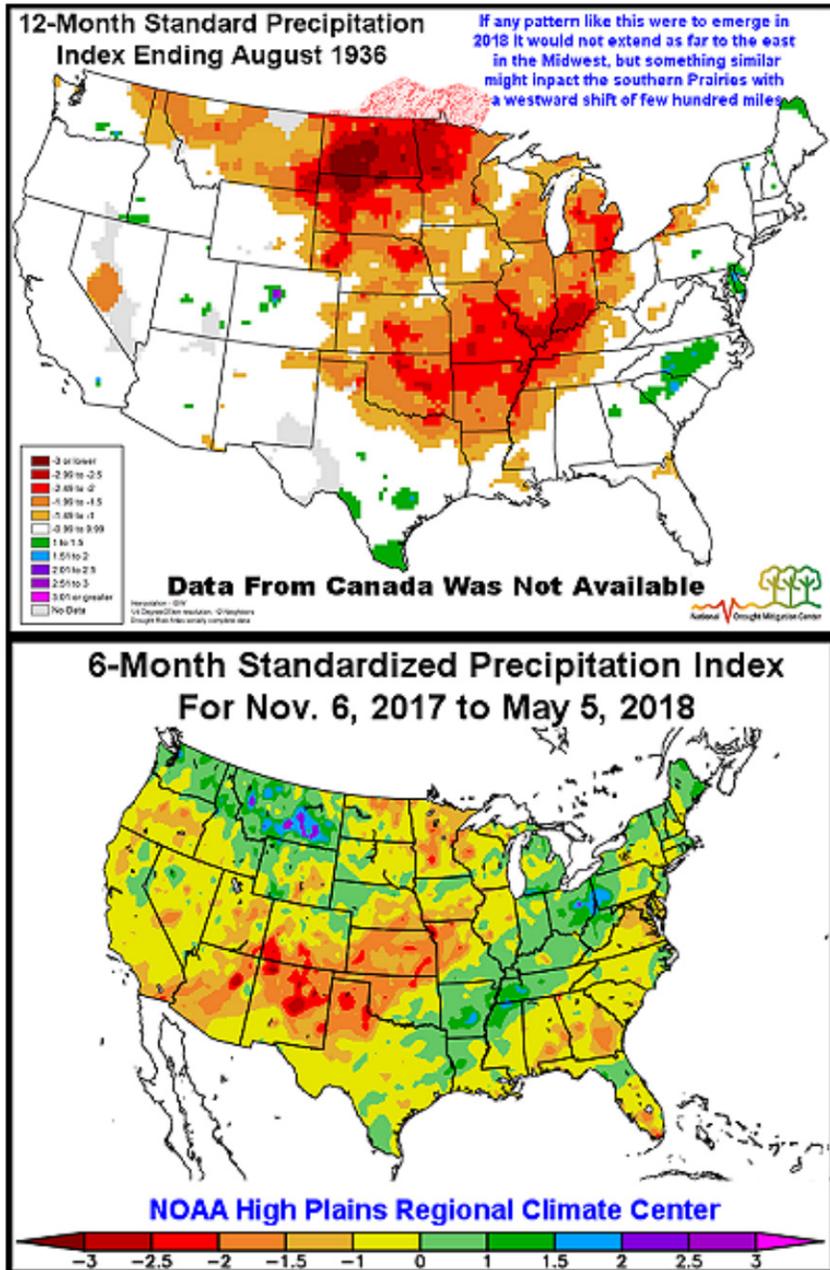
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Mexico's soil moisture reflects the lack of rain in northern areas, but in all fairness Mexico is normally quite dry at this time of year when normal winter precipitation events have all ended weeks ago and early spring dryness and heat settle in during April and May.



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North America temperatures were often colder biased during the winter and early spring. April was unusually cold and in some cases running at record cold levels from the



Canadian Prairies into the north-central United States. However, the cooler biased conditions reached from one end of the continent to the other at times. *The four-month period of January through April in the northern U.S. was one of the top 3 coldest four month periods since 1895. The other two years were 1899 and 1936.*

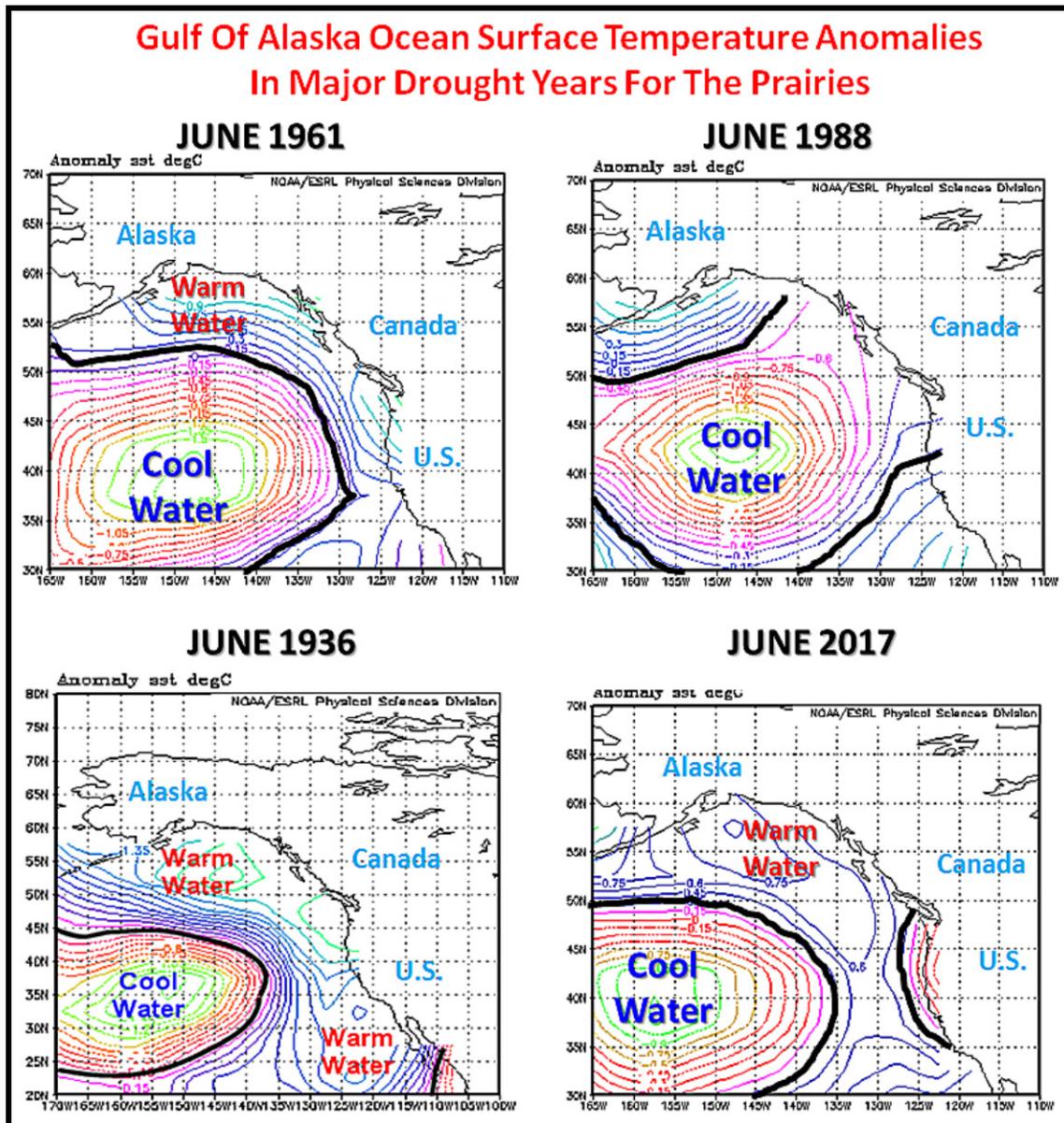
World Weather, Inc. used the anomalous 4-month period as an indicator for predicting May temperatures in North America. The fourth month anomalous period in 1899 led to colder than usual western North America temperatures and warmer than usual conditions in the central and eastern parts of the continent. 1936, however, predicted most of the North American continent would experience warmer than usual temperatures in May and the analog

from 1936 looks as though it will verify well except in eastern parts of Canada where temperatures may end up a little cooler biased.

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SUMMER OUTLOOK INFLUENCES

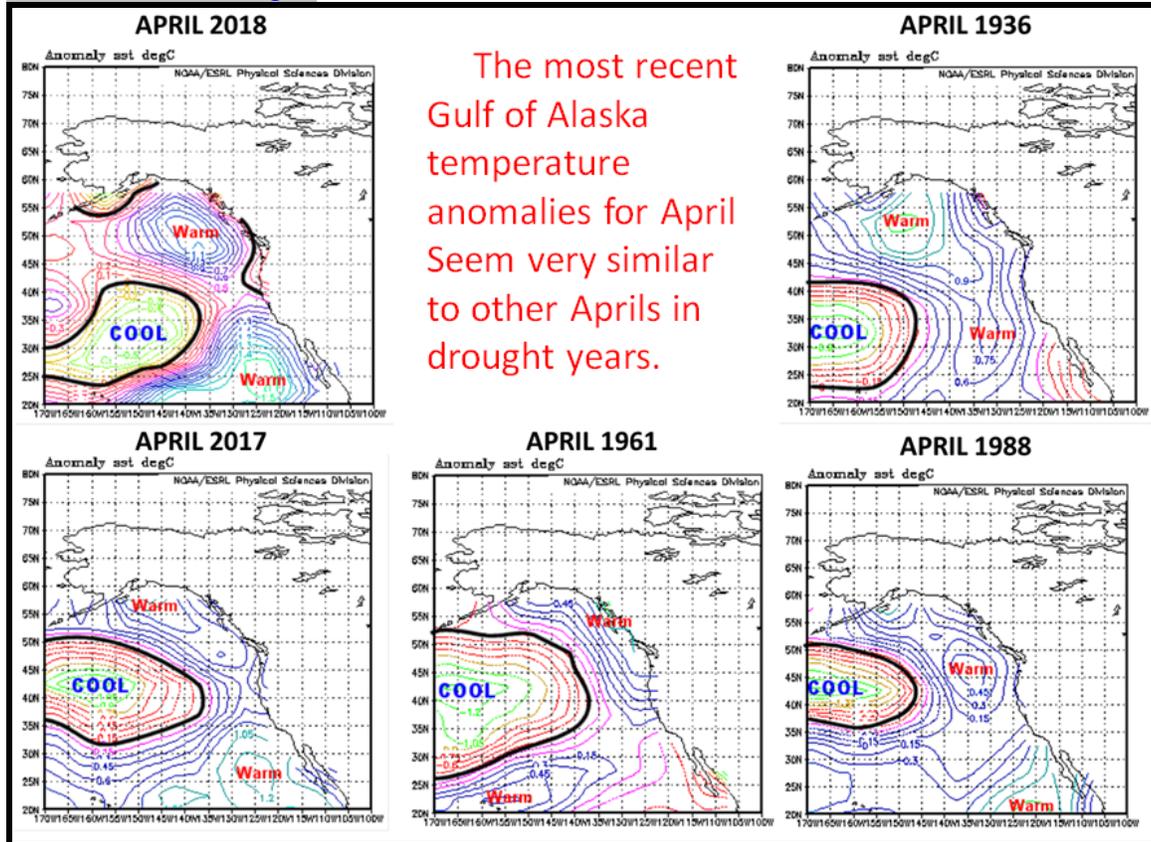
The summer of 1936, of course, was one of the worst droughts in North America recorded history and if the parallel continues the precipitation anomaly predicted by that analog is shown below above. The 12-month Standardized Precipitation Index (SPI) for the United States ending August 1936 was looking quite similar to the SPI for the six months ending May 5, 2018. The 1936 anomalies are shifted farther east relative to this year. Remember that temperature anomalies in the first five months of 2018 have closely matched those of 1936 and there are at least some parallels to the precipitation distribution in recent months – not that the trend will necessarily continue, but it is very interesting.



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The trend with 1936 does not stop with the temperatures and rainfall. Notice the Gulf of Alaska Ocean temperature anomalies for the Canadian Prairies drought years of 2017, 1988, 1961 and 1936 and then notice the anomalies for this year.

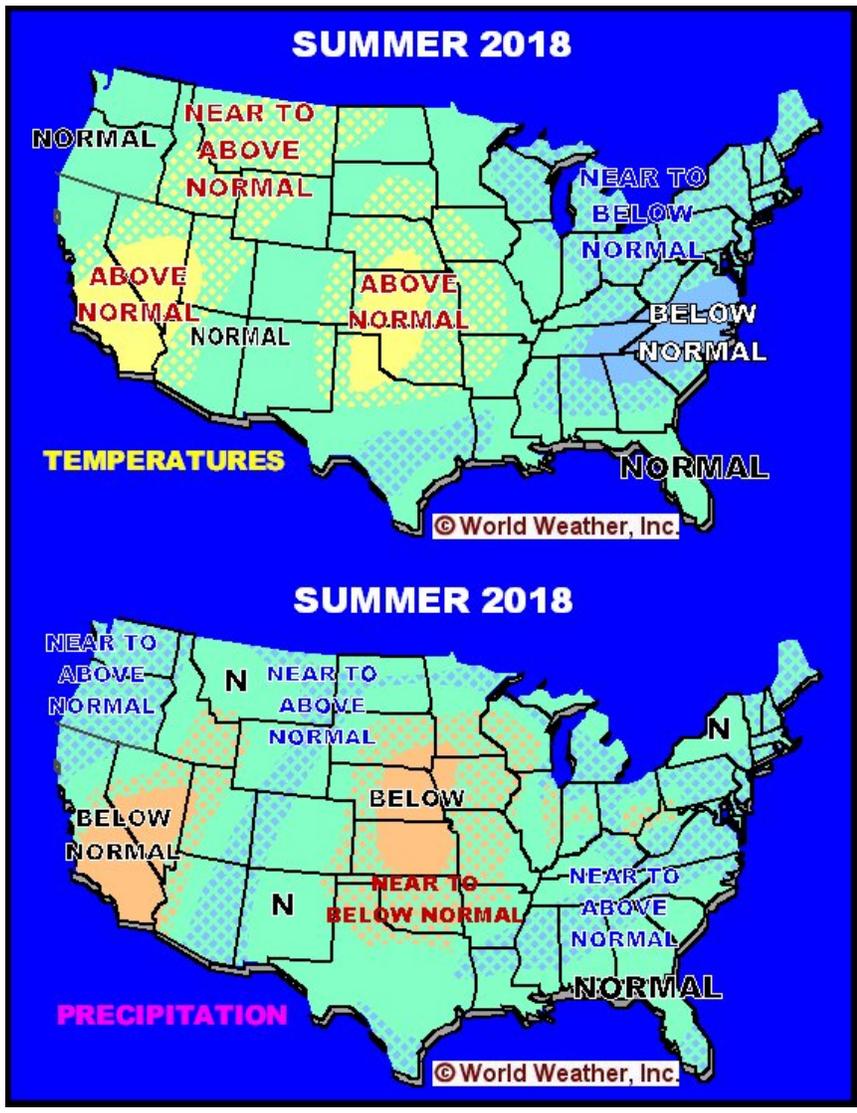
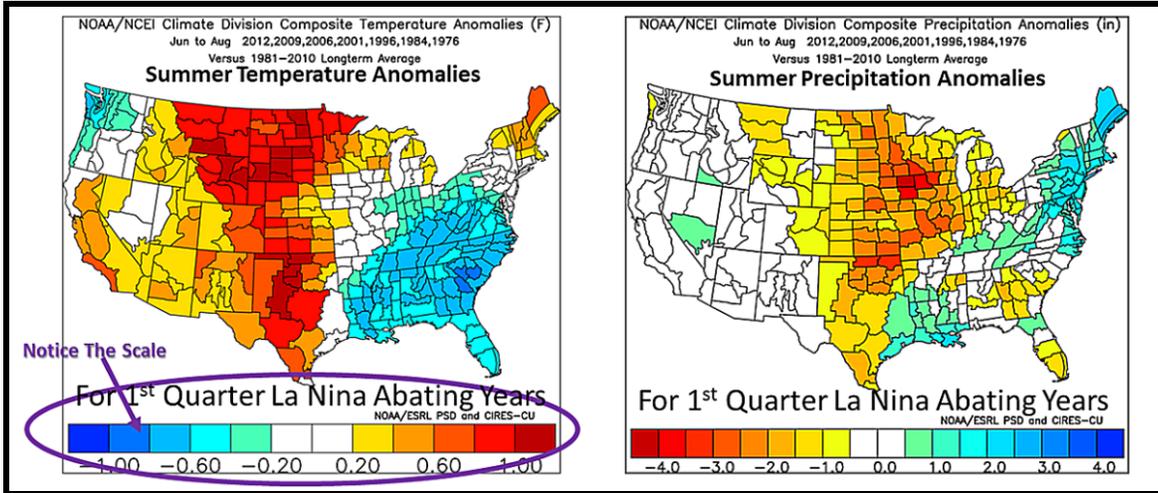
The past few months have demonstrated a consistency of similar anomalous Gulf of Alaska Ocean temperature anomalies that occurred in the months that preceded the major drought years. It is very important to note that there are other times that similar surface water temperature anomalies have occurred without inducing drought, but when we make other comparisons with temperatures and rainfall and add in a few other similar features like those associated with the solar cycle and abating first quarter La Nina events the parallel becomes much stronger.



Earlier this year, World Weather, Inc. conducted a study of first quarter abating La Nina events followed by neutral ENSO conditions during the balance of the growing season. The study suggested a strong correlation among seven years that fit the correlation and that there would be below average precipitation in the Plains and western Corn Belt during the summer season. Please notice where the greatest below average precipitation bias is advertised and go back to page 8 and look at where the 1936 dryness occurred. It will not take long to see a similar pattern in the data.

Temperatures in the abating La Nina study show warm weather in the Great Plains, Canada's Prairies and the Rocky Mountain States as well as the southwestern U.S. The 1936 anomaly has most of the North American continent warmer than usual as has been during the first half of May. The 1936 Parallel had eastern Canada with a slightly cooler than usual bias, but nowhere else. Interestingly, the abating La Nina study years have the eastern U.S., Midwest, Delta and southeastern states with a slight cooler than usual temperature bias.

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The cooler bias for this summer suggested by the abating La Nina year study may verify well because of the influence from the solar cycle minimum that is expected this year. Cool bouts of air are expected to impact eastern North America this summer because of the approaching solar Minimum and that should help the La Nina abating years parallel verify quite well.

So, you might be confused by now trying figure out whether we are going to have a 1936 style drought or not. World Weather, Inc. is sticking very closely to its previous summer weather outlook for North America offering a pattern

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similar that has occurred with other abating La Nina years because of the similar solution that comes from, 1936 and another pattern that is prevailing in the Lunar Cycle. We may be erring on the wet side of actual anomalous weather and it could turn out drier in the Plains and western Corn Belt if the 1936 parallel is stronger than the abating La Nina and Lunar Cycles.

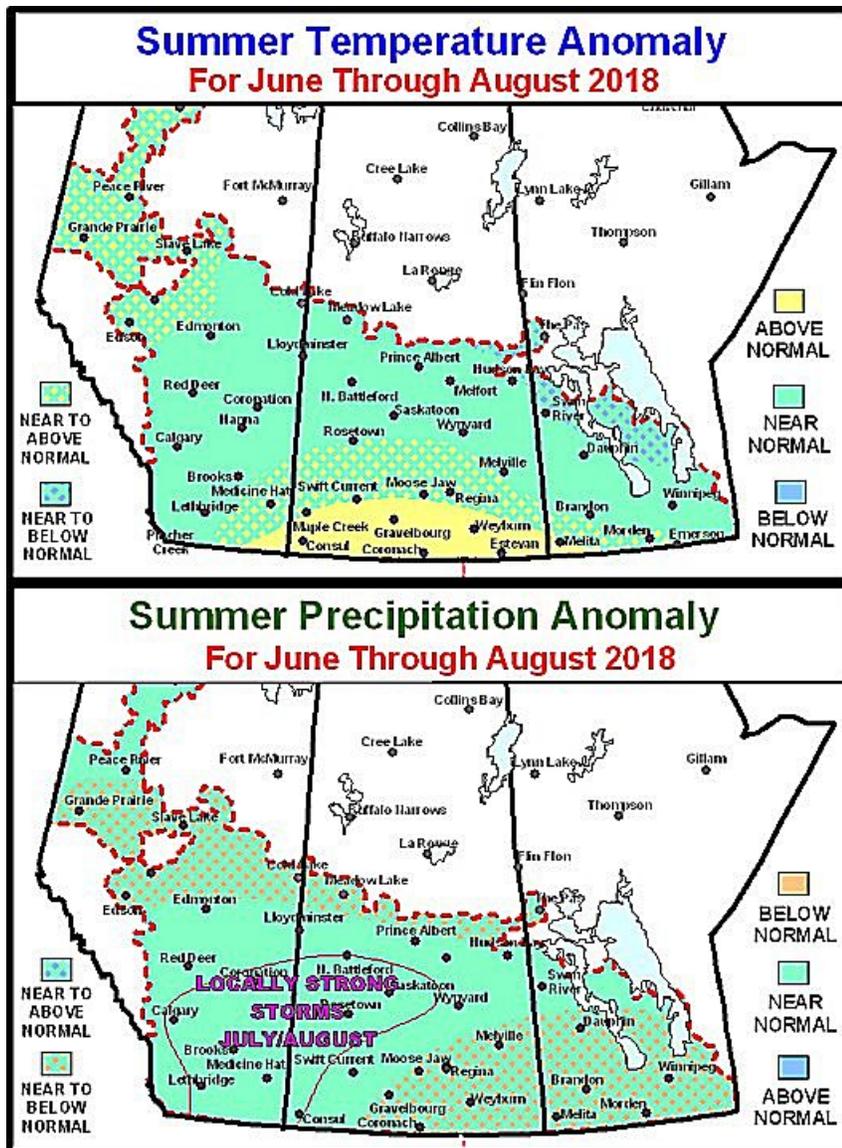
1936 cannot be repeated because of the influence from the Solar Cycle leaving the eastern parts of North America with a cooler and sometimes showery pattern. However, drought that is already present in the southern Plains, southern Rocky Mountain region and southwestern desert region will help to reinforce heat and dryness in those areas once the summer ridge of high pressure builds up during June and July.

A short term period of improved precipitation is expected over the next three weeks in the U.S Plains and eastern Canada's Prairies. The increase in precipitation will result from the development of the summertime ridge in the central and interior western U.S. and a general lifting of the jet stream into the northern U.S. and southeastern parts of Canada's

Prairies. The current ridge over western Canada is expected to break down in these next three to four weeks as the new ridge builds northward from the interior western and central United States. The breakdown of western Canada's ridge will bring on a few timely opportunities for rain in the central and eastern Canada Prairies and the northern U.S. Plains easing some of the recent dryness.

However, once the new ridge is in place, July and August will trend drier than usual again in the south-central and southeastern Canada Prairies, the U.S. Plains and western Corn Belt.

The intensity of the July/August ridge will be determined by how much rain falls in the Plains and Prairies

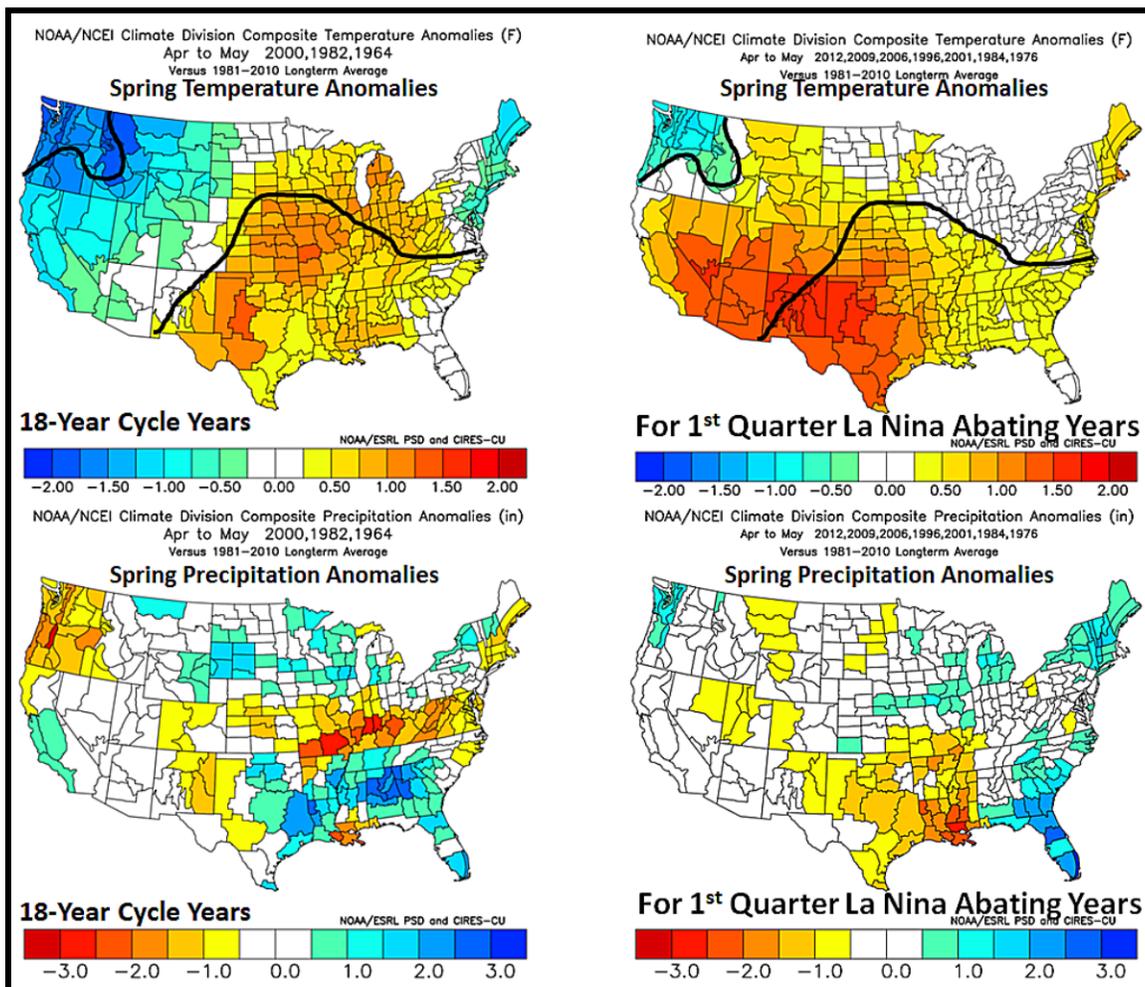


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during this transitional period of weather during the next three to four weeks. The greater rain amounts and frequency the weaker the ridge of high pressure will be. Cold ocean temperature anomalies in the Gulf of Alaska may be abating or weakening during the summer and so might the warm water between Hawaii and California and those changes will help keep the ridge intensity just weak enough for disturbances to move from the U.S. Pacific Northwest into the Prairies at times during the summer providing some timely rainfall in southern and eastern Alberta and western and central Saskatchewan. The driest areas in the Prairies should end up being in southeastern Saskatchewan and Manitoba and that dryness will extend southward into the western Corn Belt and part of the Great Plains.

Bouts of cool air in the eastern U.S. will help conserve soil moisture so that if rainfall is erratic and light as expected at times crops will still develop well because somewhat slower evaporation rates at times.

By the way, [the La Nina abating year study has verified relatively with in the past couple of months. There has been a timing delay with the anomalies starting about two weeks later than predicted, but the trends are there and if they have verified well for the spring they might just do well this summer, also.](#)



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CONCLUDING REMARKS

The bottom line is summer weather is expected to be drier biased in the Plains and western Corn Belt and temperatures a little warmer than usual and that may lead to some crop moisture stress. A full blown drought like that of 1936 is not likely, but there may be a little taste of 1936 in the U.S. Plains and Canada's Prairies at times. Canada will see rainfall a little more often than in the U.S. Plains, especially from southern and eastern Alberta through western and some central Saskatchewan locations while the driest areas will be from southern Manitoba and southeastern Saskatchewan into the U.S. Plains and western Corn Belt.

Please do not forget that the next three to four weeks will generate some welcome rainfall in eastern Canada's Prairies and parts of the western Corn Belt and Great Plains, but as time moves along the drying trends should settle in. Eastern U.S. Midwest crop production will be more successful than the western Midwest thanks to milder temperatures at times. **Ridge presence and intensity will be strongest in North America during July, August and early September.**

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