



Quarterly Canadian Weather Outlook

Forecast by:

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September 2024

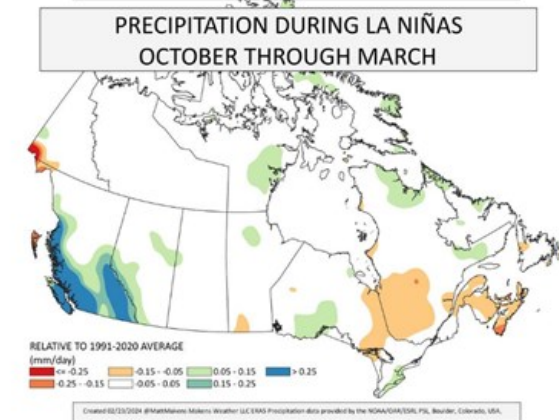
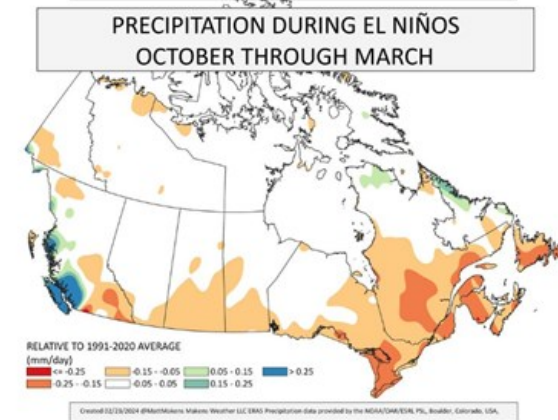
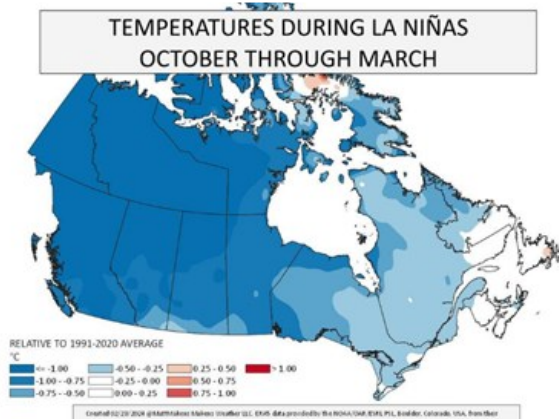
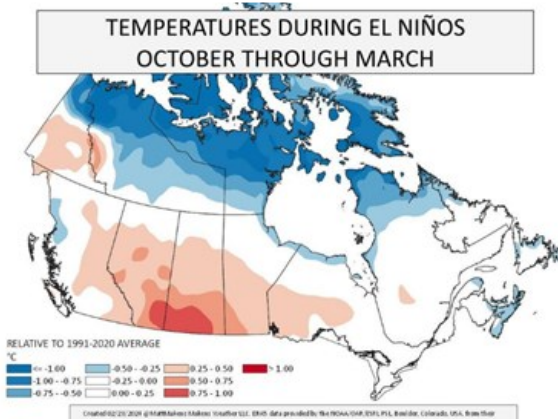
Early this year, we were in an El Niño pattern, and many of us benefited from rainfall and improved conditions through early summer compared to the last few years. Since early summer, however, we have seen a trend toward another La Niña event, which gained momentum in late August and early September.

Historically, Western and Central Canada are the most affected by La Niña; colder-than-normal winters and springs occur, and these areas can be wetter from winter to spring, too. Generally, La Niña does not have as large of an impact on Eastern Canada other than a tendency to increase hurricane activity in the Atlantic Ocean. I highlighted the word "can" above because of what I discuss regarding the strength of these events below.

During the cold season, the El Niño/La Niña Oscillation has the second-largest impact on our weather outside normal seasonal changes. This winter, you will hear much about La

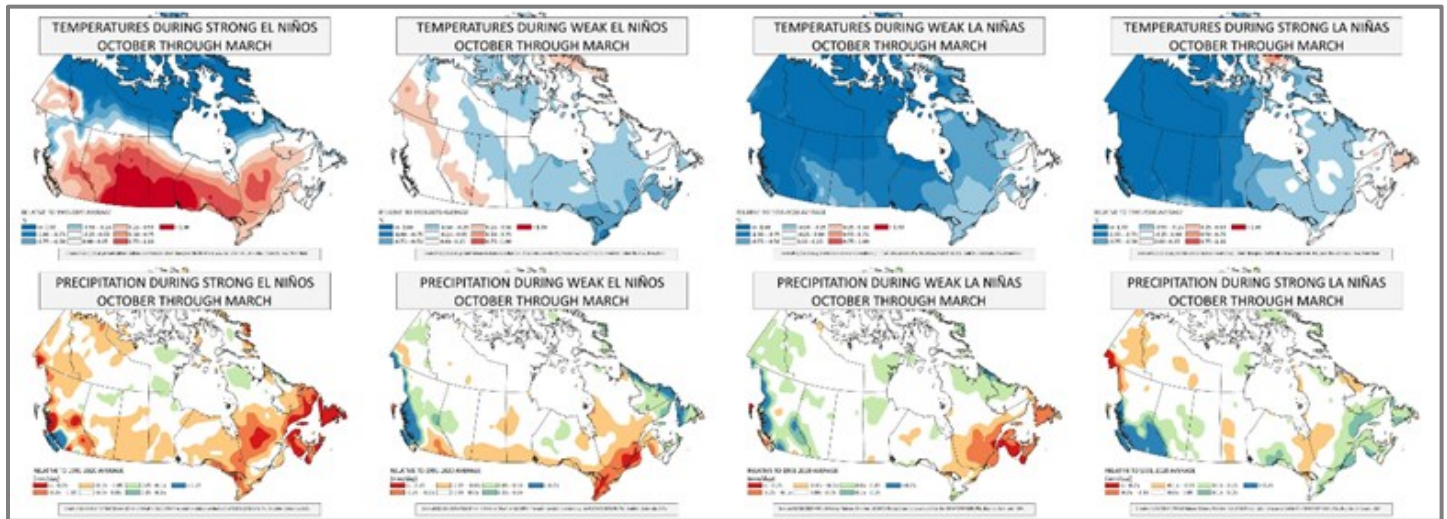
Niña, which continues to try to develop in ocean conditions despite having arrived in our atmospheric pattern in August. The question now is how strong of an event this may be. The strength will be critical in determining the odds of moisture or drought for the West and Prairies and how cold the winter can be country wide.

Let us recall the difference between the two—El Niño and La Niña—and these images will demonstrate why there is such a difference. I plotted the temperatures and precipitation differences from their averages for El Niño (when the Equatorial Pacific Ocean is warmer than average) and La Niña (when the Equatorial Pacific Ocean is colder than average). Notice how the warmer temperatures (reds) flip with the colder-than-normal temperatures (blue shades) between phases. You can see another flip in dry versus wet areas.



This is a general average of all events. The strength of events is much more nuanced than that; for example, a *weak* La Niña’s precipitation pattern can be quite different from a *strong* event. To illustrate this, notice the composite image below, which has strong El Niños through strong La Niñas in

terms of temperatures (across the top) and precipitation (across the bottom); the bottom two right images are both La Niñas, but the weaker events tend to keep eastern Canada, including the Maritimes, drier than a stronger La Niña event.



WHY GET SO SPECIFIC? We are facing that situation for this outlook and will likely have a situation that blends the images for a weak and strong La Niña.

Through late August, the ocean conditions were neither El Niño nor La Niña. However, the atmosphere did suggest a La Niña, which is likely where the entire global pattern ends up for the fall and winter. Some of the neutral to weak (neutral to weak is our most probable outcome as of now) La Niña falls and winters include but are not limited to 1980-81, 1992-93, 1995-96, and 2016-17.

For this outlook, I also want to consider falls and winters like 1983-84, 2005-06, 2007-08, 2017-18, 2019-20, 2020-21, and 2021-22. I added these years to the list for various reasons, but primarily to account for any unexpected development toward a strong La Niña event and include an event like 2019-20, which never really did much of anything.

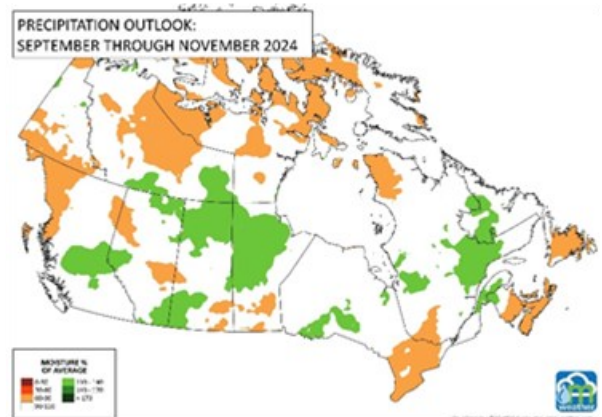
There are differences now versus those years, however, in the behaviours of the ocean in the Northern Pacific and across the Northern and Central Atlantic, plus the higher atmosphere over the polar region that will alter this year versus those listed. I identify those issues within the best-fitting years and adjust the outlook. The biggest concern for the forecast right now, aside from the strength of this La Niña event, is the behaviour of the North Pacific Ocean in the Gulf of Alaska, which will impact the ultimate precipitation for B.C. and across the Prairies as well as for eastern provinces.

By combining historical patterns and computer modeling, we are headed toward a weak to moderate La Niña, and you will

see that reflected below in the sections when comparing this outlook to computer simulations. Verification has shown that computer simulations have not necessarily handled recent La Niña events well, which is why forecasters use history as a guide when making projections.

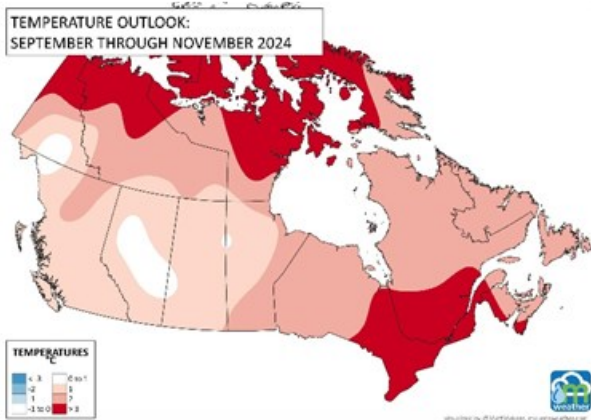
In summary, plan for a colder winter than last year, with sporadically placed moisture favouring the west in the fall and shifting eastward in the winter. It should be noted, however, that to the east, they will still have to consider the potential impacts of the hurricane season.

FALL 2024



Moisture will be sporadically present but will focus on the higher elevations of British Columbia and Alberta and on the western Prairies. To the east, moisture will most likely fall on a path from central Ontario through Quebec. Temperatures will begin to cool with some of the nearest average conditions for the West, while the East stays warmer than average.

Comparing this to computer model simulations, the temperatures in the modeling are warm across the board. Moisture resembles that of the American CFS and European SEAS, but the Canadian CANSIPS modeling is much drier.



REGIONAL SPECIFICS FOR THIS FALL

British Columbia: Precipitation anomalies for the coast will decrease from October to November when more of that available moisture heads to the provinces to the east. Warm temperatures from September will cool as more frequent shots of cold arrive.

Alberta: October and November will get more moisture than September. I think October will be the best chance this fall. Temperatures do run warmer than average but begin to cool as moisture increases and we start seeing more frequent systems arrive.

Saskatchewan: October and November will not be as dry as September, and I like October's potential the most of the three months this season. More frequent shots of cold arrive, so the warm start to fall turns more typical by November.

Manitoba: Temperatures run warmer than average through October, but November turns colder. As the cold air becomes more frequent from October through November, we will get more moisture, but I feel the wetter spots will be in central to northern areas.

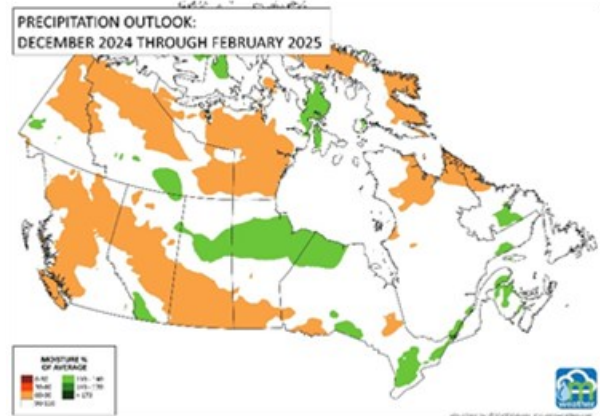
Ontario: There is a storm flow that likely moves moisture across the central part of the province, and that's where I feel the better chances are for surplus moisture. Nearer the Great Lakes is far enough from that storm flow to keep us drier than average. The American CFS model disagrees with me and puts the moisture over the Great Lakes rather than the north. The Canadian CANSIPS is quite dry for almost everyone. Temperatures will be rather warm this fall, with the cold trying to hold off until very late this season, from late November into December.

Quebec: The province's moisture will most likely occur in October but will not be surprised if it carries into early November. There is potential for cold air here, but it may

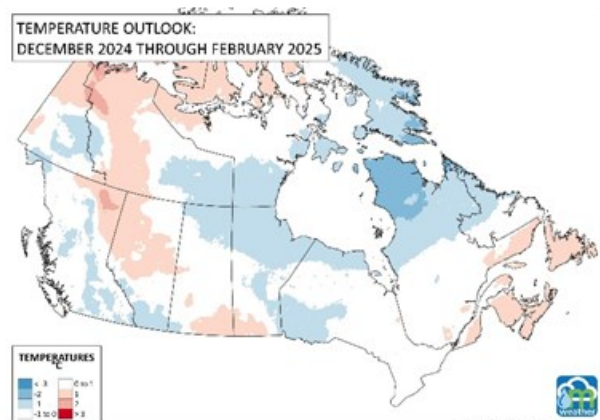
come too late in the season to offset the three-month average being warmer than average.

Maritimes: Subject to tropical cyclones and remnants of such systems, as a source of moisture, otherwise it will be drier than average. Temperatures here run warmer than average throughout, but some colder water in the Atlantic not too far from Nova Scotia could keep some of this area cooler than average this fall.

WINTER 2024



For the winter, it all hinges on the ultimate strength of this La Niña event. Since more weight is applied to weak/moderate events in this analog forecast, you will see how the temperature outlook includes warmer temperatures on the high plains east of the Rockies and for parts of the Prairies. This accounts for drier-than-average conditions with chinook wind flow to keep things a bit warmer. Should a strong event develop, a lot colder air will be expected than what is shown. Changes will also apply to the precipitation, which will most likely favour the southern Rockies and parts of the east. A stronger event can promote heavier mountain area snow and increase some moisture potential for the Prairies. If I were to change anything, my hunch would be that the analog years are too warm, and we end up colder compared to this outlook, but that hunch requires data from October before we could see a potential shift of analog years to colder ones.



CANADIAN DROUGHT MONITOR

As of July 31, 2024 Source: [Agriculture Canada](https://www.agriculturecanada.ca)

