

Drought Report for the Agricultural Region of Alberta:

July 18, 2004

Summary

Since the last report (July 4th, 2004), a number of significant storm events have continued to bring precipitation to many areas of the province, with total accumulations ranging from 0-140 mm. Much of the precipitation was delivered by severe thunderstorms accompanied by hail, funnel cloud sightings and a few tornado touchdowns. As a result of these localized thunderstorms, some areas may have received more precipitation while others may have received less than what has been reported here. Areas largely missed by recent storm activity include the already dry northern and extreme southwestern Peace region, parts of east central Alberta, as well as much of southern Alberta. Most of the precipitation was centered around the Swan Hills (140 mm) with total amounts upwards of 40 mm extending into the southeastern Peace region, across most of the northern parts of the reporting area and much of the north west, with a broad band extending through much of central Alberta, including Edmonton, Red Deer, and as far south as the County of Wheatland.

As a result of the recent precipitation, the areas classified as *Drought* in the central and east central portions of the province have greatly decreased but still remain as small points on the map. In the south, three pockets classified as *Drought* have also decreased in size since the July 4th report, confined mostly to the M.D.'s of Pincher Creek and Cardston and the County of Forty Mile. The areas mapped as *Drought Alert* in the July 4th report have diminished greatly save for the northern part of the Peace region, which has increased slightly.

Precipitation during the past 90 days has resulted in a trend toward at least *Normal*, or low risk of *Drought*, for most of the province, including all areas currently in *Drought* status. One exception applies to the northern Peace region where the 90-day trend is towards *Drought Alert*. If the 90-day trend towards *Normal* persists existing long-term *Drought* conditions will normalize in most areas within in a few months.

Soil moisture conditions were predicted to be *Well Below Normal* in much of west central, western and southern Alberta as well as the central part of southern Alberta. Within these areas, several small pockets of *Extreme Deficit* can also be found, suggesting many of the areas currently classified as *Well Below Normal* may grade to *Extreme Deficit* if precipitation deficiencies occur. In the Peace region, all but the southeastern areas are predicted to have *Well Below Normal* soil moisture conditions with areas of *Extreme Deficit* found over much of the northern Peace and parts in the extreme southwest Peace region. There is still immediate need for moisture in these areas as there is not enough soil moisture reserve to carry a crop through the next two weeks in these areas.

Current Situation

Long-term *Drought* (Figure 1):

- Since the last *Drought* report the areas classified as *Drought* have decreased from 5% to just over 1% of the reporting area. Areas in this category in northern Alberta, include a small pocket in the M.D. of Lesser Slave River, one in western Alberta in the County of

Yellowhead, and in central and southern Alberta, five other pockets exist, one in the County of Starland, one spanning the boarder between Special Areas 3 and 4, and one each in the Counties of Forty Mile, Cardston, and Pincher Creek. Of significant note is the fact that the northern Peace region is not categorized as *Drought* despite dire need of moisture there. The reason for this is that *Much Below Normal* precipitation began to fall at the onset of the growing season. Prior to this these areas received mostly *Below Normal* precipitation over winter and *Normal* precipitation through most of June, July and August of last year.

- Currently nearly 31% of the reporting area is in *Drought Alert* down from 52% reported in the July 4th, 2004 *Drought* report. Recent rains have reduced the *Drought Alert* areas in much of northern and central and southern Alberta. Currently *Drought Alert* areas include west central Alberta, central Alberta and east central Alberta with some pickets remaining in southwestern and south central Alberta.
- The areas classified as *Normal* have increased significantly and now are account for 68% of the reporting area up from 43% as reported 14 days ago in the last *Drought* report. These areas include the most of the southern half of the Peace region, most of northern Alberta, about half of northeastern Alberta as well as much of southern Alberta.

Recent trends (Figure 2):

- The area representing recent (90-day) trends toward *Normal* conditions decreased since the last report but still represent most of the mapped area. Since 52% of the province was in *Drought Alert* status, this represents a trend toward improvement in most of the affected areas
- 90-day trends towards *Drought Alert* were found in two pockets in the northern Peace region affecting the M.D.'s of Mackenzie, Northern Lights and Northern Sunrise. Of these areas, if current 90-day trends persist those areas currently in *Drought Alert* status are expected to stay in *Drought Alert* and those areas in *Normal* are expected to move into *Drought Alert*.

Precipitation (Figure 3, Figure 4 and Figure 5):

- At least *Above Normal* precipitation over the last 90 days was recorded over most of the reporting areas, with notable exceptions in the northern Peace region where *Much Below Normal* precipitation has been recorded in the M.D.'s of Mackenzie, Northern Lights and Northern Sunrise, as far south as Manning. The rest of the northern Peace region is reporting *Below Normal Precipitation* as far south as Peace River including M.D.'s of Fairview and Peace. Other relatively large areas reporting *Below Normal* include the M.D. of Lesser Slave River, a long north-south running corridor in east central Alberta that extends between the southern edge of Lake Land county down as far south as Starland County. In the south, the same conditions are occurring in the Counties of Forty Mile and Cypress. Smaller pockets can be found in various areas around Alberta including the Counties of Parkland, Lacombe, Starland, Special Areas 3 and 4, Warner and Pincher Creek (Figure 3).
- Since the last report (June 4th, 2004) a series of storm events, coupled with thunder storm activity, has continued to deliver varying amounts of precipitation 0-140 mm over much of central Alberta with the majority of the precipitation falling around the Swan Hills (140

mm) and beyond with total amounts between 40-90 mm extending into the south eastern Peace region, greater than 50 mm across most of the northern parts of the reporting area and much of the north west and in central Alberta, a broad band of precipitation (>50 mm) extending through much of central Alberta, including Edmonton, Red Deer, and as far south as the County of Wheatland. The northern Peace region remains in desperate need of precipitation as less than 10 mm has fallen over much of this area. The remainder of the northern half of the Peace region received between 10-20 mm of precipitation, barely enough to sustain crop growth. Much of southwestern and southeastern Alberta was also missed by the recent storm activity, with total amounts in these areas ranging between 0 and 20 mm. The same is also true in parts of east central Alberta for parts of the Counties of Wainwright, Flagstaff and Two Hills, which reported less than 20 mm of precipitation. All other locations within the reporting areas received between 20 to 40 mm, which is enough precipitation to supply the crop needs for the next week or so. (Figure 4).

- July is historically a very important month for precipitation with 30-year normals that range between 30 mm in south central Alberta to 140 mm in the northwest (Figure 5). Given current soil moisture conditions, a return to *Normal* precipitation totals should result in adequate crop growth over most of the province with the exception of south central Alberta. Dry conditions here, in and around the County of Warner currently exist and as a result *Above Normal* precipitation will be needed to ensure good crop growth.

Soil Moisture (Figure 6, Figure 7 and Figure 8):

- Soil moisture levels were less than 50 mm of plant available water for most of south central Alberta and east central Alberta, stretching as far north as the County of St. Paul, with a few pockets appearing in central Alberta in the Counties of Ponoka and Lacombe as well as Special Areas 2, 3 and 4 and the M.D. of Acadia. Much of southeastern Alberta has soil moisture levels of less than 25 mm, a condition requiring immediate precipitation for continued crop development (Figure 6). However, for many of these areas, particularly in the south east and east central areas, soil moisture levels of below 50 mm represent an *Average* condition which highlights the dependence of agriculture in these areas on regularly occurring timely rain fall events (Figure 7). In the northern Peace river region soil moisture levels are below 50 mm in the counties of Fairview, Peace, Clear Hills, Northern Sunrise, Northern Lights and Mackenzie. Any remaining crops, permanent pasture or hay land in this area are in desperate need of precipitation. In the rest of the northern and western Peace region, soil moisture levels are between 25-50 mm, which translates to soil moisture deficits of *Extreme* to *Well Below Normal* for this time of year. Most of western Alberta, the southeast Peace region and the northeast have soil moisture levels ranging greater than 50mm and as high as 150 mm (Figure 6). These areas are currently not in a crop moisture deficit but again, continued rainfall is needed to keep crop growing as depending on soil moisture conditions a crop can use upwards of 30 mm of water in a week
- Soil moisture levels are in *Extreme Deficit* for most the northern and the extreme southwest portions of Peace region a condition that has worsened since the last report (July 4th). In the northern part of the reporting area, soil moisture deficits continue to be *Well Below Normal* to *Extreme Deficit* but the areas affected have diminished in size and are not confined to the M.D.'s of Lesser Slave Lake, Opportunity and the County of Lake Land. Since the last report, the areas of *Extreme Deficit* in the northwest have disappeared,

grading into *Below Normal* to *Near Normal*. Since the last report, areas of *Well Below Normal* soil moisture in west and west central Alberta have decreased but are still affecting the Counties of Woodlands, Wetaskiwin, Clear Water, Ponoka, Camrose, Lacombe, Red Deer, Mountain View and Rocky View. In addition, one pocket of *Extreme Deficit* can be found in the County of Lacombe and one in the County of Clearwater. In southern Alberta, areas in the *Well Below Normal* category have expanded and now include most of the County of Forty Mile, Warner Cardston and parts of the M.D. of Pincher Creek. One isolated pocket of *Extreme Deficit* in the County of Cardston continues to intensify. At least *Near Normal* soil moisture conditions are predicted to occur in many parts of the south half of the Peace county in addition to east half of the reporting area and most of southern Alberta (Figure 8).

Explanation of Terms

Long term (hydrologic) *Drought*

Long term, or hydrologic, *Drought* is a result of the cumulative effect of several dry months. It primarily impacts livestock feed and water supply and may affect annual crops. Hydrologic *Drought* is determined from precipitation totals over a 365-day period using the Standardized Precipitation Index (SPI). Long-term *Drought* is rated as either *Wet*, *Above Normal*, *Normal*, *Drought Alert*, *Drought* or *Exceptional Drought*. The SPI is recommended for *Drought* identification by the United States National Drought Mitigation Centre. The long-term *Drought* conditions are reported year-round.

The trend in long-term *Drought* is determined by comparing the 365-day SPI with the 90-day SPI. Where the 90-day SPI value is -1 to $+1$, then a trend toward moderating conditions is occurring, potentially resulting in *Normal* status. If the 365-day SPI values for that area are already *Normal*, then the trend is towards no change. If the 90-day SPI value is -1 to -2 , then the area is trending towards *Drought Alert* status. This could be a deteriorating condition if the current 365-day value is *Normal*, however it could represent a continuing condition if the area is already in *Drought Alert*, or an improving condition if the area is already in *Drought*. Values of the 90-day SPI that are between -2 to -3 and lower than -3 indicate a trend toward *Drought* and *Extreme Drought* respectively. Values of the 90-day SPI that are between $+1$ and $+2$, and greater than $+2$ represent a trend toward *Above Average* and *Wet* respectively.

Soil Moisture (reported during the growing season months only)

The crop gets the moisture it requires from the reserve of soil moisture, which in turn is replenished by rainfall. Soil moisture is a valuable indicator of *Drought* potential because it shows the reserve of water available to the crop at a given point in time. During peak growing periods, soil moisture reserves are consumed quickly and must be replenished frequently by rainfall. Low soil moisture reserves during these times indicate a high risk of immediate crop stress. Prolonged stress becomes *Drought*, and results in significant unrecoverable yield loss.

Because the climate varies across Alberta, comparing current moisture levels to normal levels provides a valuable indicator of *Drought* risk that can be applied to all localities and to all times of the season. *Below Average* soil moisture levels, at any time, indicate a need for more rain or snow to restore reserves.

Soil moisture is measured as millimeters (mm) of plant available water. Plant available water is approximately half of the total water that can be measured in the soil. Soil moisture is monitored from May through October.

Report prepared by the Drought Reporting Team

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This report was created on July 18, 2004.

Drought analysis is currently scheduled at bi-weekly intervals between May 1 and October 30. This report was generated as a result of a widespread recent precipitation and updates the previous report of July 04th, 2004.

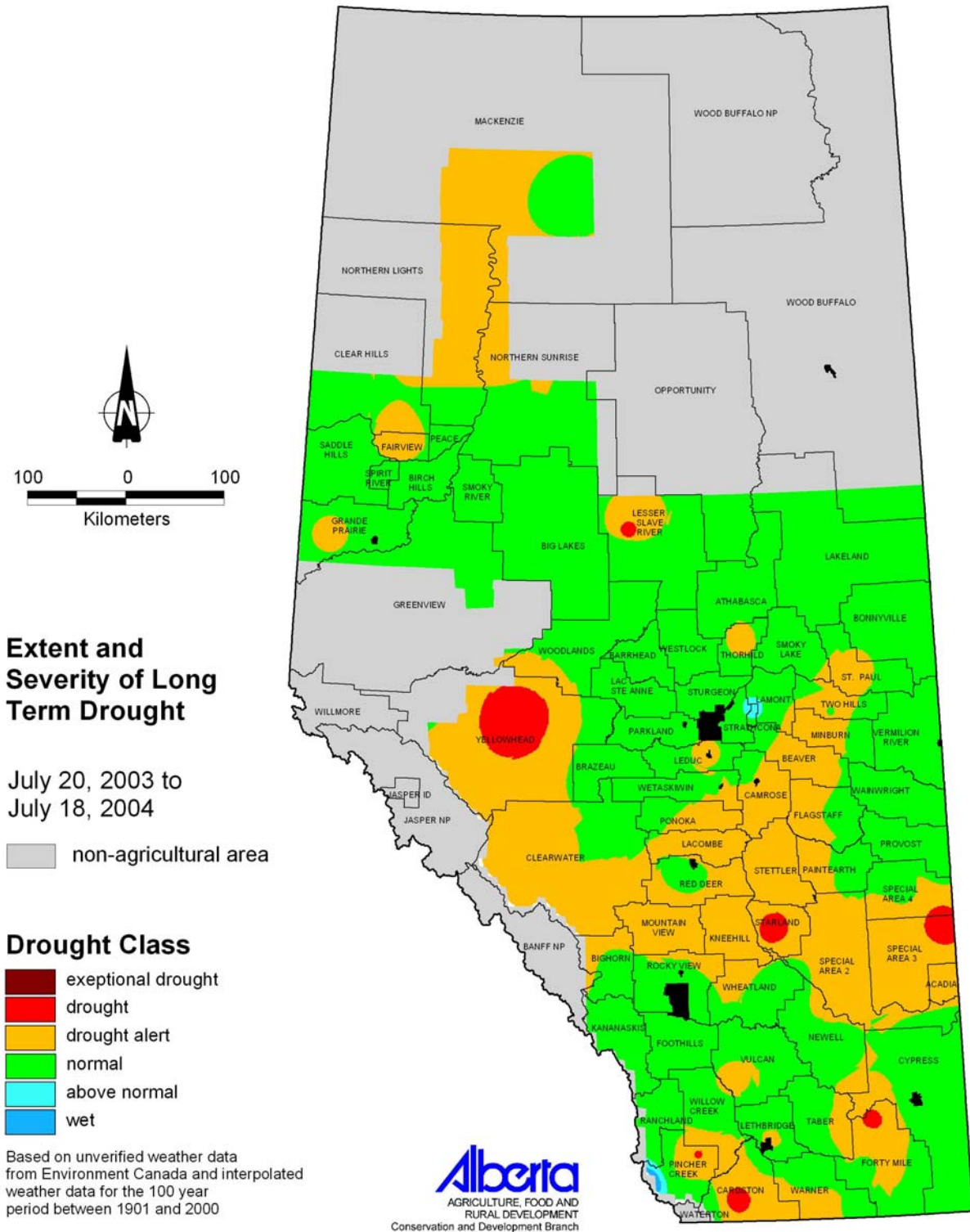


Figure 1. Extent and severity of long-term drought in the agricultural region of Alberta, as of July 18, 2004

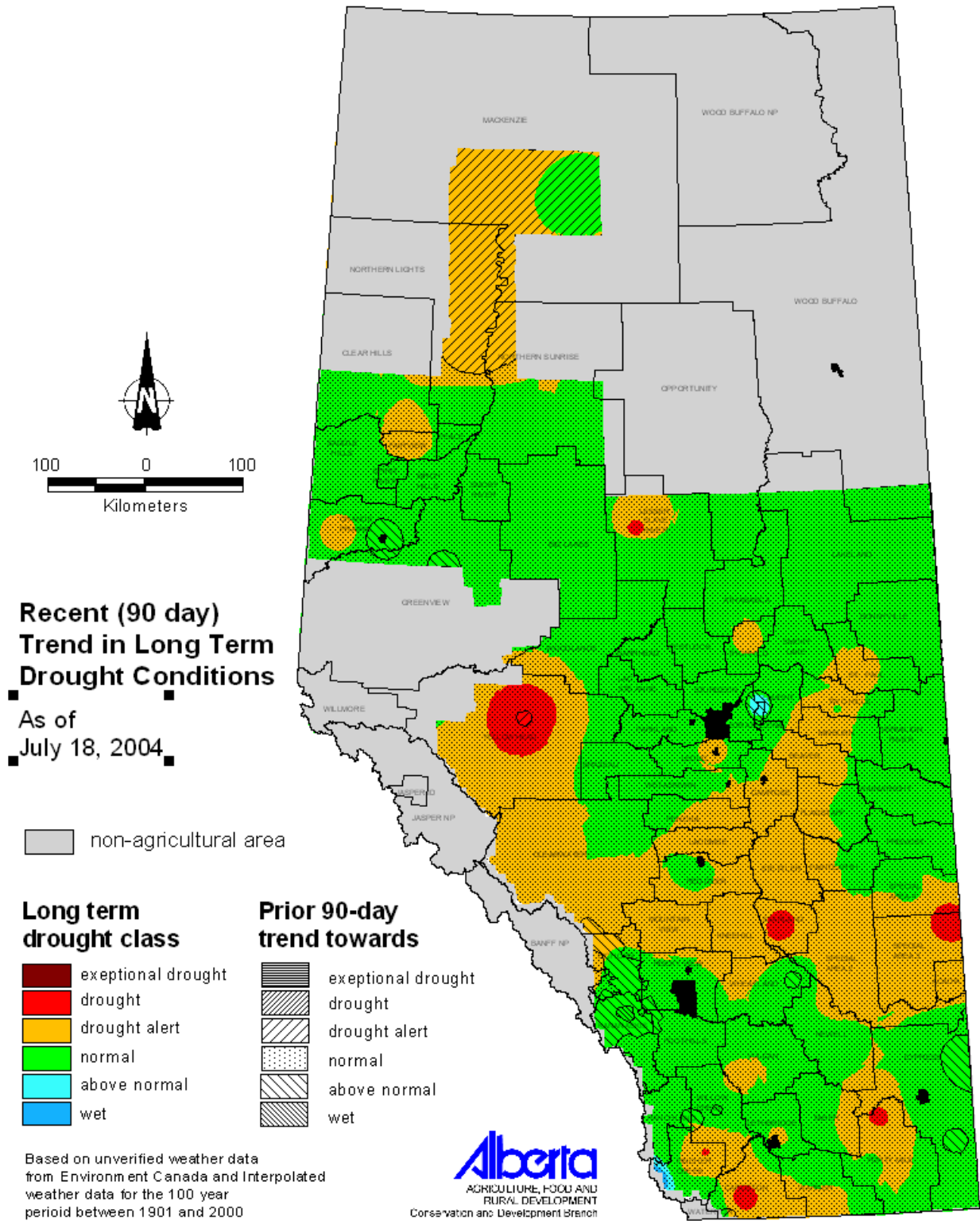


Figure 2. Recent (90 day) trends in drought status in the agricultural region of Alberta as of July 18, 2004.

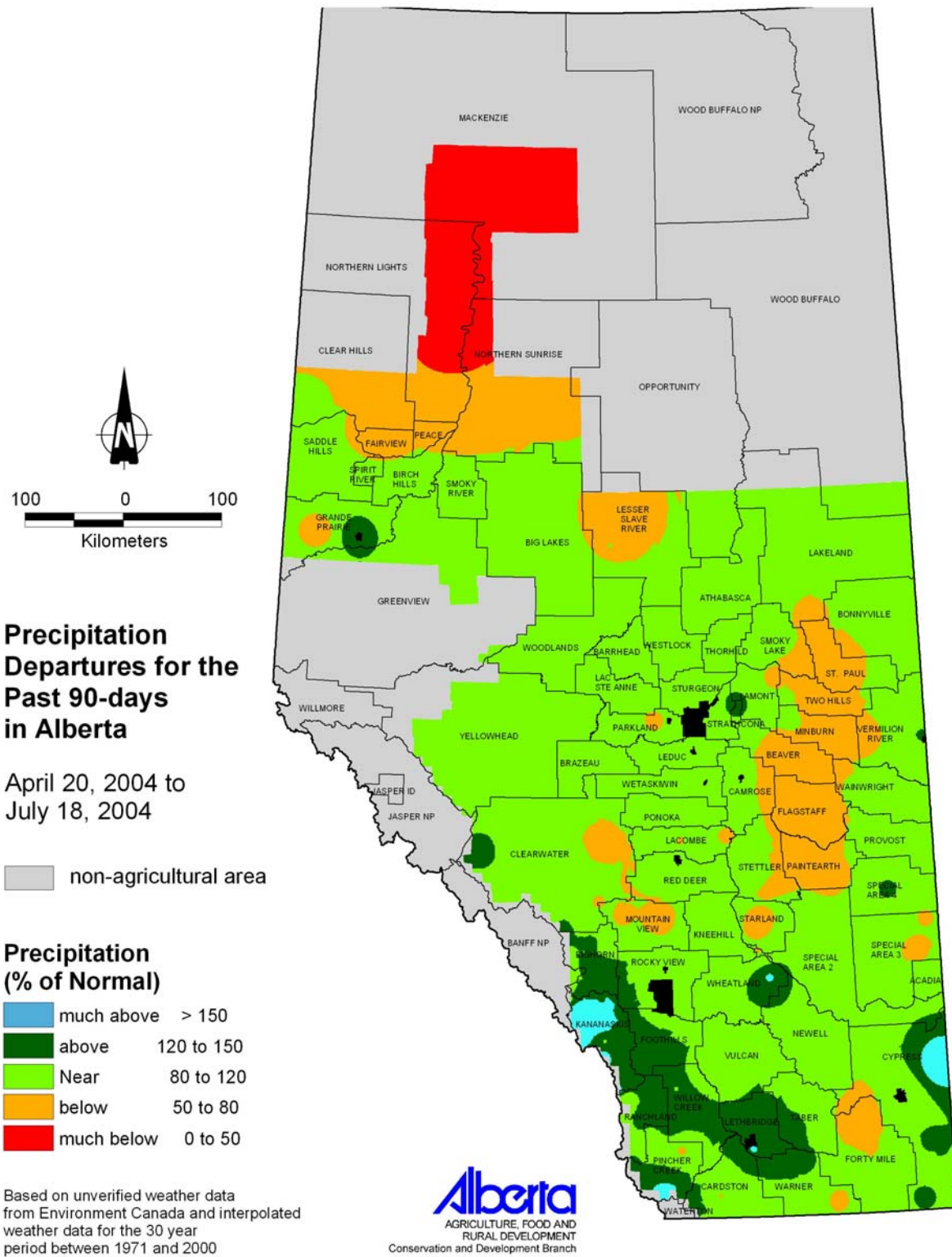


Figure 3. Precipitation departures in the agricultural region of Alberta for past 90 as of July 18, 2004.

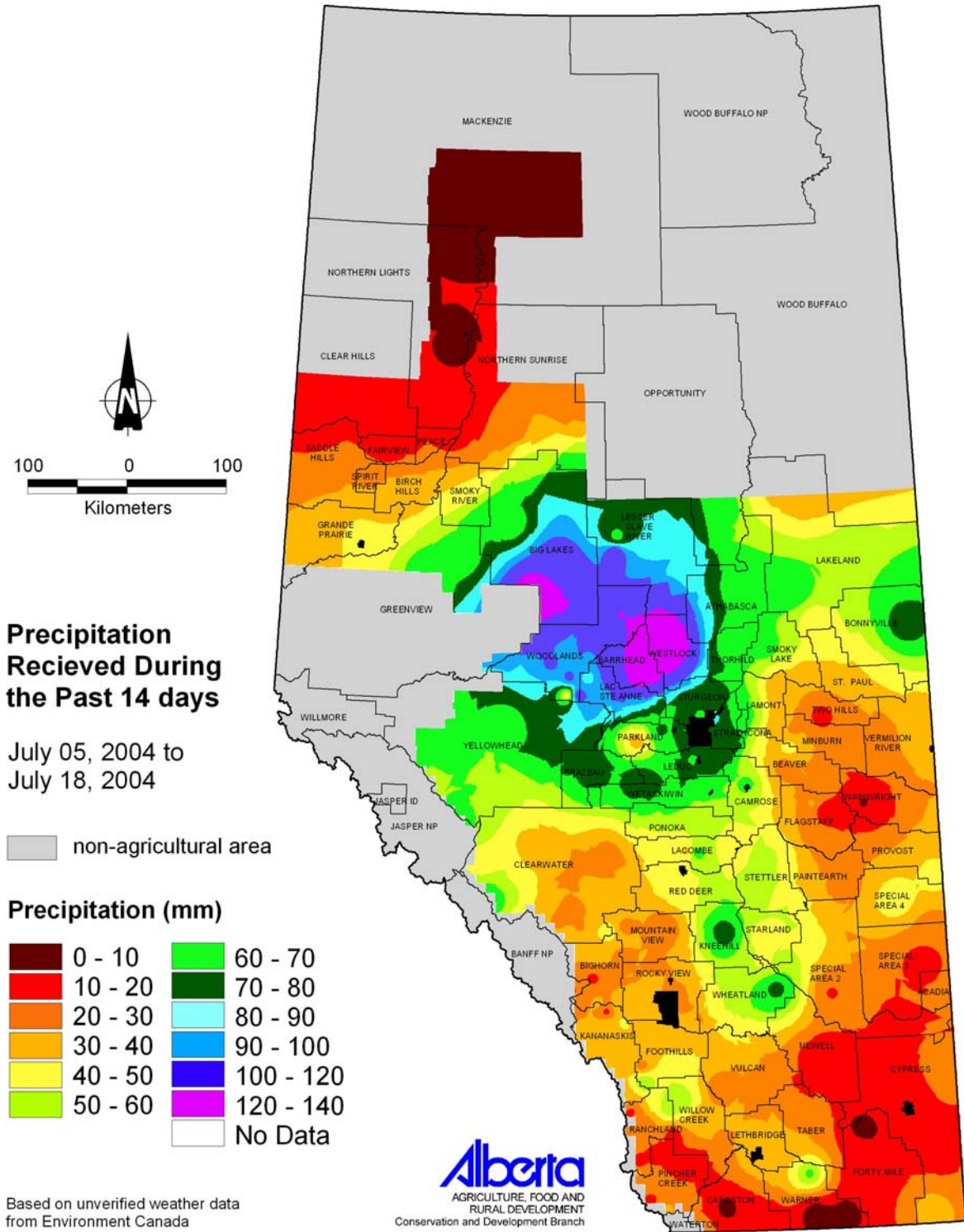


Figure 4. Precipitation (mm), since the last Drought report, as of July 18, 2004 in the agricultural region of Alberta. The last drought report was July 04, 2004.

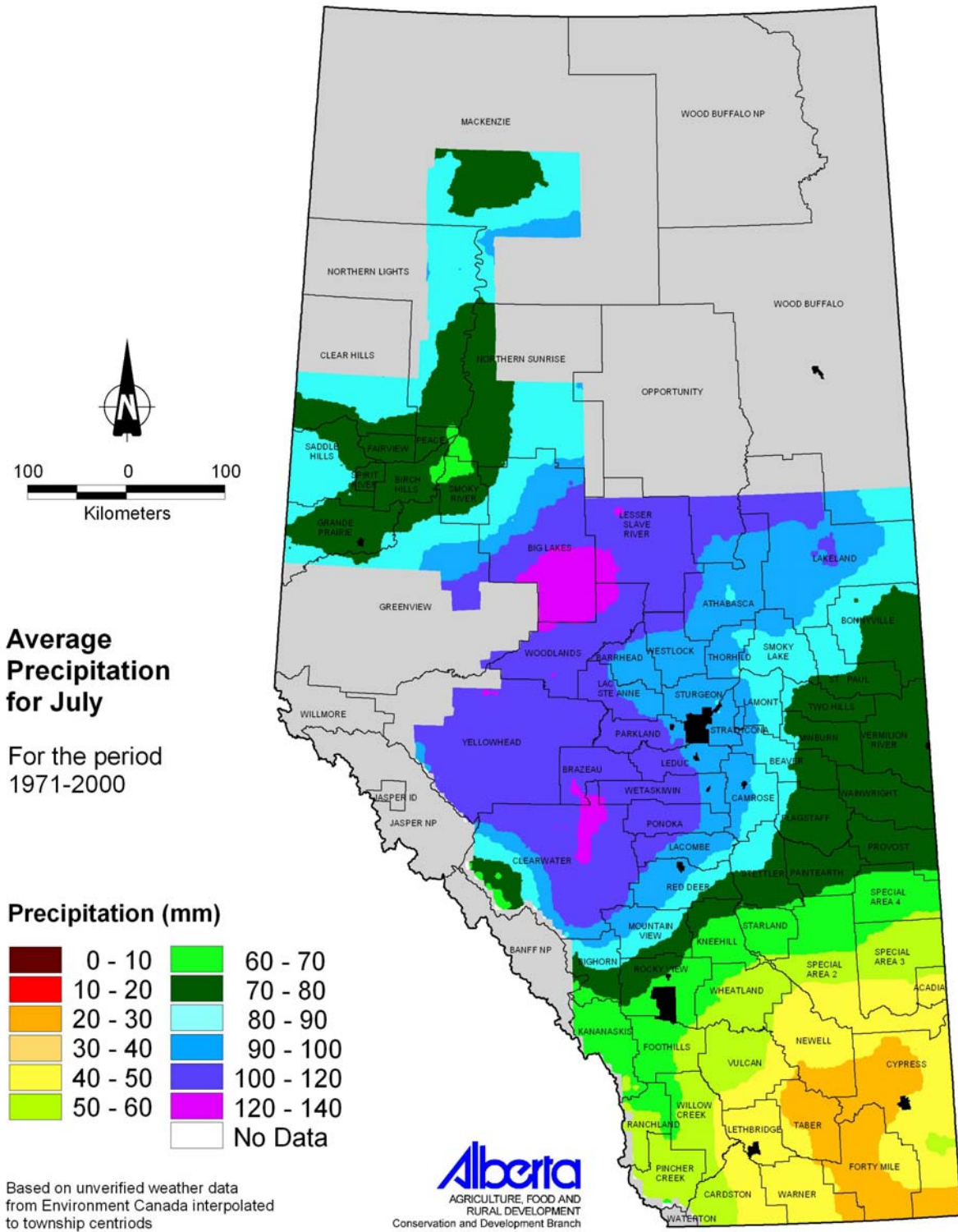


Figure 5. Average precipitation for July in the agricultural region of Alberta based on thirty years of data (1971-2000).

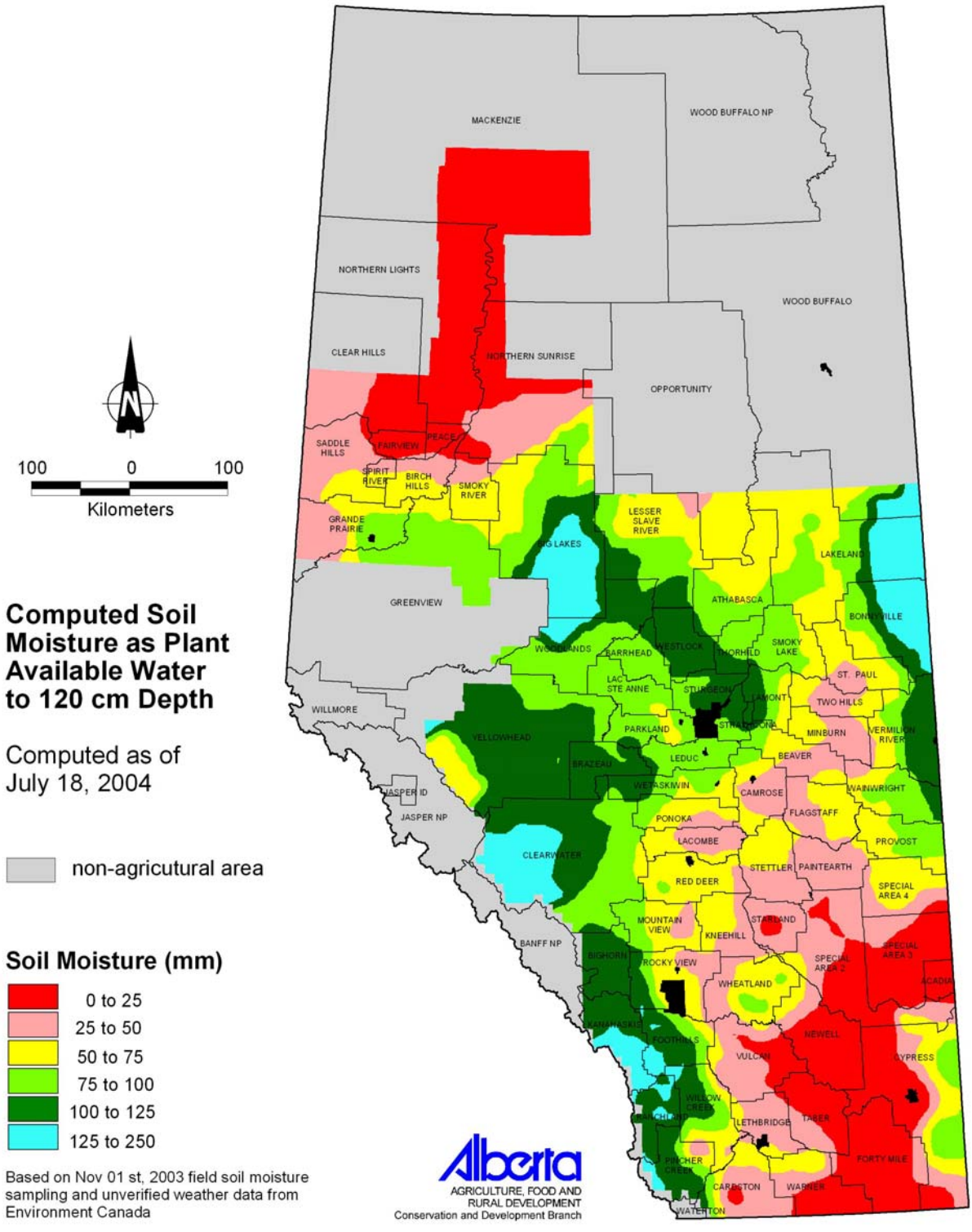


Figure 6. Soil moisture in the agricultural region of Alberta as of July 18, 2004.

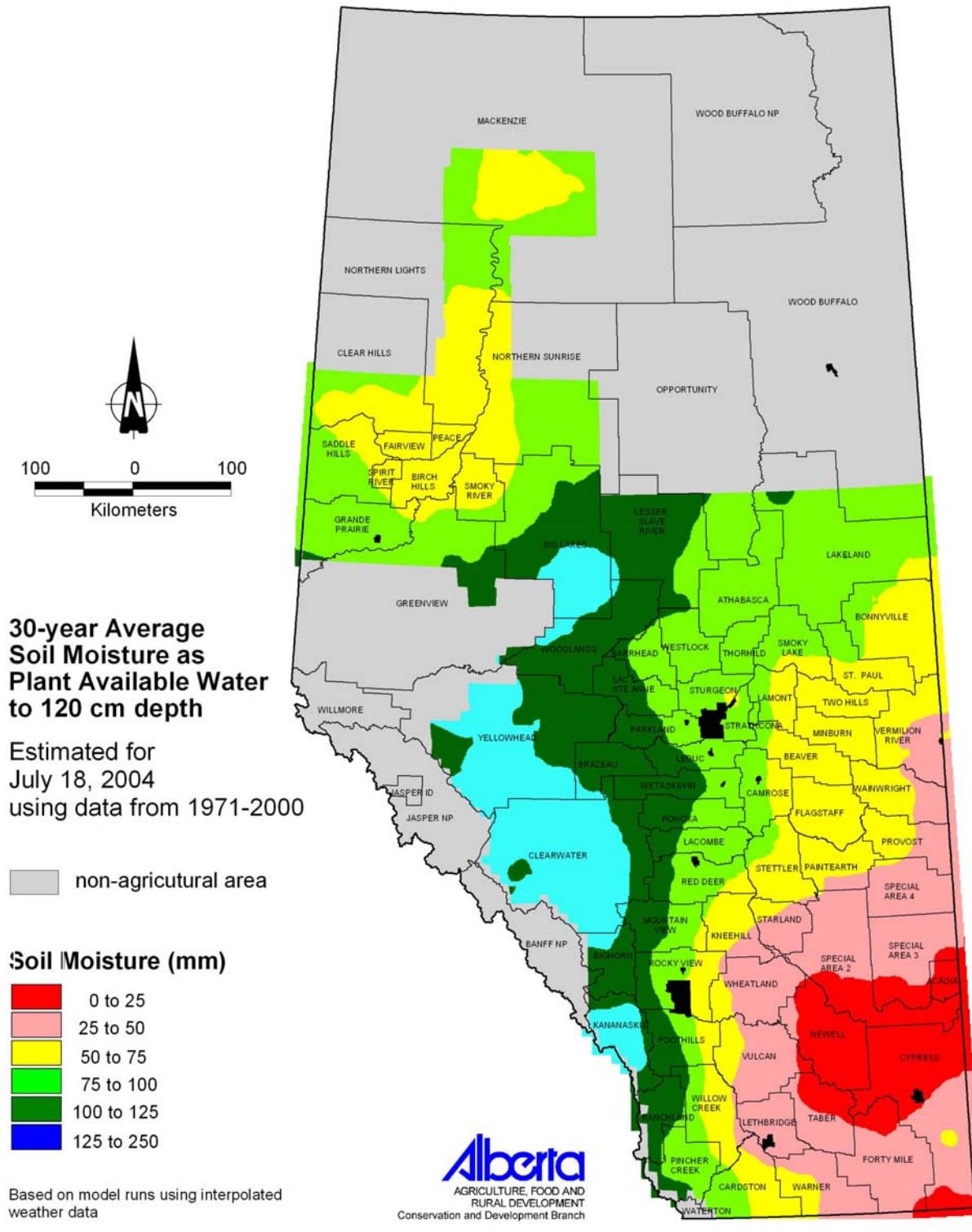


Figure 7. Modeled 30-year average soil moisture conditions for July 18

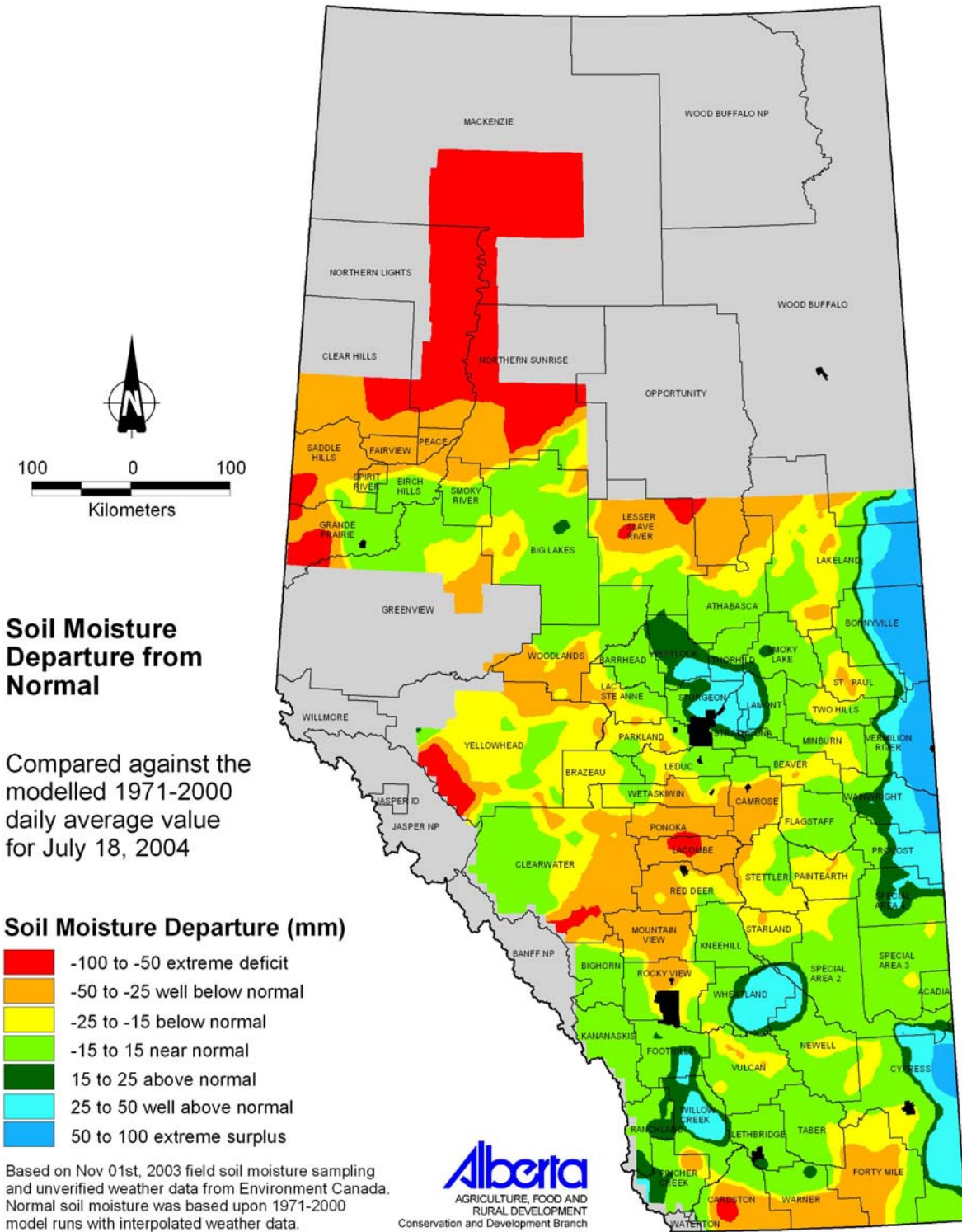


Figure 8. Soil moisture departure in the agricultural region of Alberta from average modeled soil moisture for July 18, 2004.