

Drought Report for the Agricultural Region of Alberta: July 04, 2004

Summary

Since the last report (July 27th, 2004), a significant storm event brought precipitation to most areas of the province with total accumulations ranging from 0-90 mm. As a result of a number of localized thunderstorms that occurred within this event, some areas received more precipitation than was reported and others less. Areas missed by this event include the already dry northern and extreme southwestern Peace region, along with northwestern and southeastern Alberta. Areas that received the most precipitation include most of the south half of the Peace region (40-90 mm), the Edmonton area and as far east as the County of Lamont (40-90 mm). In parts of east central Alberta where precipitation was desperately needed, amounts ranged between 40-70 mm. Further precipitation is expected over the next week and return to at least *Normal* conditions at this time should result in good crop growth for most of the province.

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. In the south, three pockets classified as *Drought* still exist and are confined mostly to the M.D.'s of Pincher Creek and Cardston and the County of Forty Mile. In the north east the *Drought Alert* area has grown and now extends as far north as the M.D. of Lakeland. In the northern part of the Peace region a large area of *Drought Alert* has emerged whereas in much of the western Peace, *Drought Alert* conditions have graded into *Normal* although a few pockets still persist.

Precipitation during the past 90 days has resulted in a trend toward *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 Alberta including northwestern and north central Alberta and two pockets in southern Alberta. Soil moisture reserves were predicted to be in *Extreme Deficit* in the northern Peace, southwestern Peace and much of northwest and north central Alberta as well as a portion of central Alberta. 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 (June 27th, 2004) the two areas of *Exceptional Drought*, one in Stettler and a smaller area straddling the boarder between Special Areas 4 and 3 have disappeared.
- Since the last *Drought* report the areas classified as *Drought* have decreased from 10% to about 5% of the reporting area. Areas in this category in northern Alberta, include a portion of the County of Westlock and in central Alberta, all or parts of the Counties of Beaver, Camrose, Lacombe, Stettler, Red Deer, Kneehill and Starland are in the *Drought* category which also extends into east central Alberta including, each of the Special Areas (2, 3, and 4) and Acadia. In southern Alberta three isolated pockets in the *Drought*

category can be found which affect portions of the counties of Pincher Creek, Cardston, Forty Mile and Cypress.

- Currently nearly 52% of the reporting area is in *Drought Alert* down about 3% from that (55%) reported in the June 27th, 2004 *Drought* report. Recent rains have reduced the *Drought Alert* areas in the western half of the Peace region but lack of moisture in the northeast has resulted in increases to the *Drought Alert* category in this part of the province. In the Peace region, most of the north is currently in *Drought Alert* and also included in this category are the parts of the M.D.'s of Clearhill, Fairview and Green View as well as the County of Grande Prairie. Much of the rest of the reporting area remains in *Drought Alert* in an area extending from north central Alberta all the way down to southern Alberta.
- The areas classified as *Normal* have increased significantly and now account for 43% of the reporting area up from 35% as reported 7 days ago in the last *Drought* report. These areas include about half of northeastern Alberta, most of the southern half of the Peace region and numerous pockets in southern Alberta, the largest of which are west of and surrounding Calgary, much of Cypress County with smaller isolated areas emerging in the Counties of Newell, Warner Lethbridge, Cardston and the M.D.'s of Willow Creek and Pincher Creek.

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 (Figures 3 – 5):

- At least *Above Normal* precipitation over the last 90 days was recorded over most of the southern half of Alberta and much of western and eastern Alberta as far north as Edson and Lloydminster, respectively. Within this area some locations recorded *Below Normal* precipitation including part of the Counties of Mountain View, Cypress, Forty Mile, Warner and Special Areas 3 and 4. Most of the southern half of the Peace country reported at least *Normal* precipitation except a few pockets in the M.D. of Fairview and the County of Grande Prairie where *Below Normal* precipitation was recorded. In northern Alberta and parts of central Alberta, *Below Normal* precipitation dominated the reporting area as was also the case in the northern Peace with some areas of the M.D.'s of Northern Lights Northern Sunrise and Mackenzie reporting *Much Below Normal* (Figure 3).
- Since the last report (June 27th, 2004) a major precipitation event delivered precipitation over much of the province except the northern Peace region and northeast and southeastern Alberta where very little precipitation was recorded (0-10 mm). Many areas may have received more or less than what are depicted on the map as a result of localized thunderstorm activity. The majority of the precipitation fell in the five major areas across the reporting area, listed in decreasing order;

1. The Edmonton area and as far east as the County of Lamont received between 50-100 mm.
2. The southern half of the Peace region received between 40 to 90mm with the highest amounts being recorded at Grand Prairie (90 mm).
3. East central Alberta received between 40–70 mm bringing much needed relief to some very dry areas, specifically, the Counties of Wainwright, Flagstaff, Stettler, Paintearth, Provost and Special Area 4.
4. In the M.D. of Willow Creek precipitation ranged between 40-70 mm
5. In the M.D of Clearwater, Nordegg reported 50 mm.

All other areas in the reporting areas received between 10 and 40 mm, which on the lower end of this scale is not enough precipitation to supply the crop needs for at least the next few days (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 (Figures 6 – 7):

- Soil moisture levels were less than 50 mm of plant available water for most of south central Alberta, and the Special Areas 2, 3 and 4 and the M.D. of Acadia. For many of these areas, this represents a *Normal* condition with exceptions occurring in the Counties of Forty Mile and the east sides of Taber and Warner where soil moisture levels are 25 mm and immediate precipitation is required. Areas in north central Alberta where soil moisture levels predicted to be between 25-50 mm include the Counties of Lac Ste Anne, Barrhead, Westlock, Woodlands, Athabasca, Lakeland and the M.D.'s of Lesser Slave River and Opportunity. In the Peace region, all of the northern areas and the extreme southwest have less than 50 mm of plant available water with the M.D.'s of Northern Lights, Northern Sunrise and Mackenzie mapping at less than 25 mm of plant available water. Soil moisture levels ranging between 25-50 mm are only sufficient to carry annual crops through the next two weeks. Where moisture levels have fallen below 25 mm, immediate precipitation is required. Pasture conditions in these areas are expected to be even drier. Some areas of the province are predicted to have high soil moisture levels and these include areas near the Swan Hills, east of Edmonton, the foothills of western Alberta and in east central Alberta around a large area centered on Lloydminster. Too much moisture in these locations may result in crop losses in low-lying areas (Figure 6).
- Soil moisture levels are in *Extreme Deficit* for most the northern and the extreme south west portions of the Peace region as well as much of northwest Alberta extending down through the Counties of Parkland, Leduc, Wetaskiwin, Ponoka, Lacombe and an isolated area spanning the borders between Stettler, Red Deer, Knee Hill and Starland Counties. Soil moisture levels are *Well Below Normal* in most of north central and west central Alberta, extending as far south as the Counties of Mountain View and Kneehill. In southern Alberta, areas in the *Well Below Normal* category include most of the County of Forty Mile and parts of Taber and Warner counties. At least *Near Normal* soil moisture conditions are predicted to occur in many parts of the south half of the Peace country in addition to east half of the reporting area and most of southern Alberta (Figure 7).

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 toward no change. If the 90-day SPI value is -1 to -2 , then the area is trending toward *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.

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This report was created on July 07, 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 June 27, 2004.

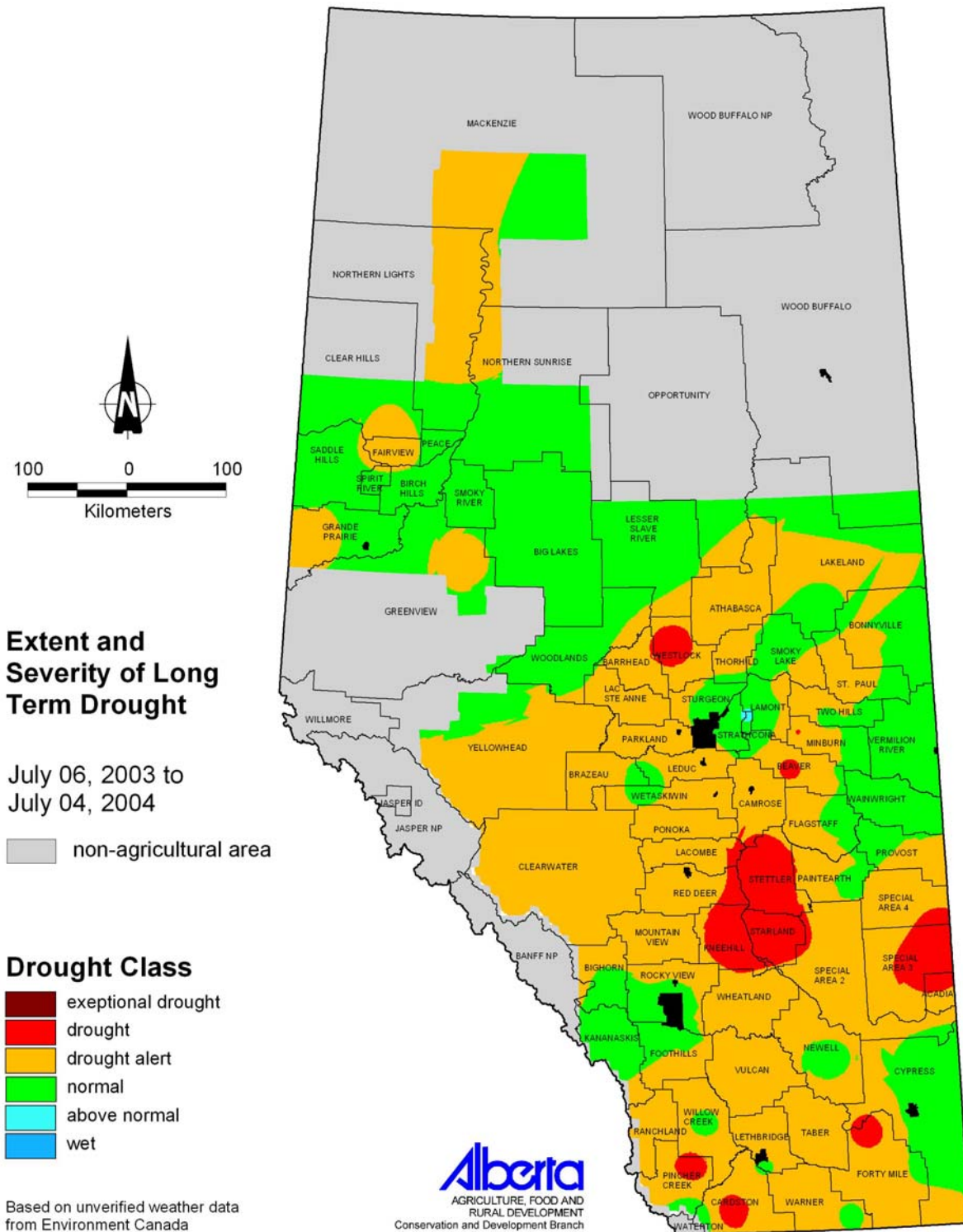


Figure 1. Extent and severity of long-term drought in the agricultural region of Alberta, as of July 04, 2004

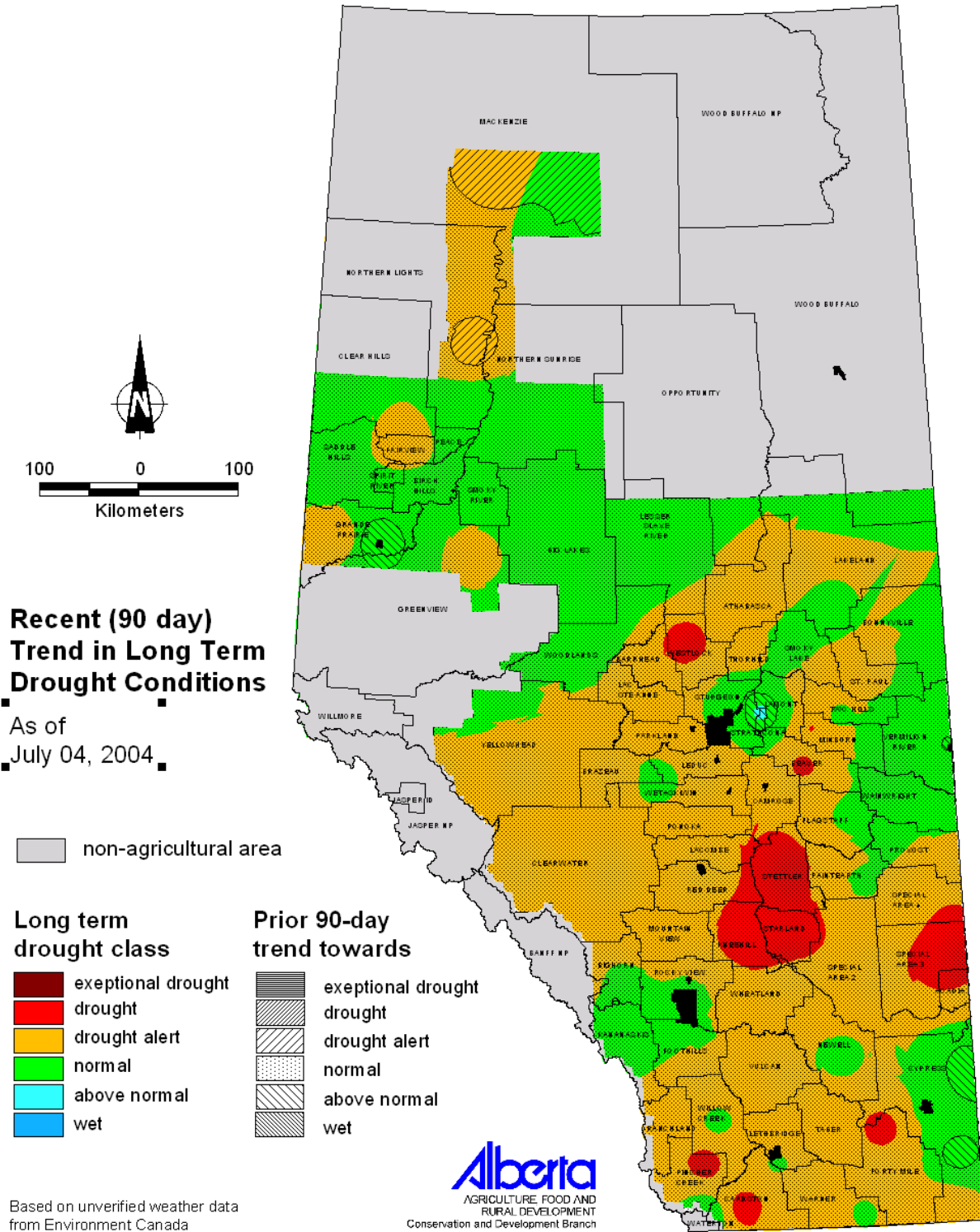


Figure 2. Recent (90 day) trends in drought status in the agricultural region of Alberta as of July 04, 2004.

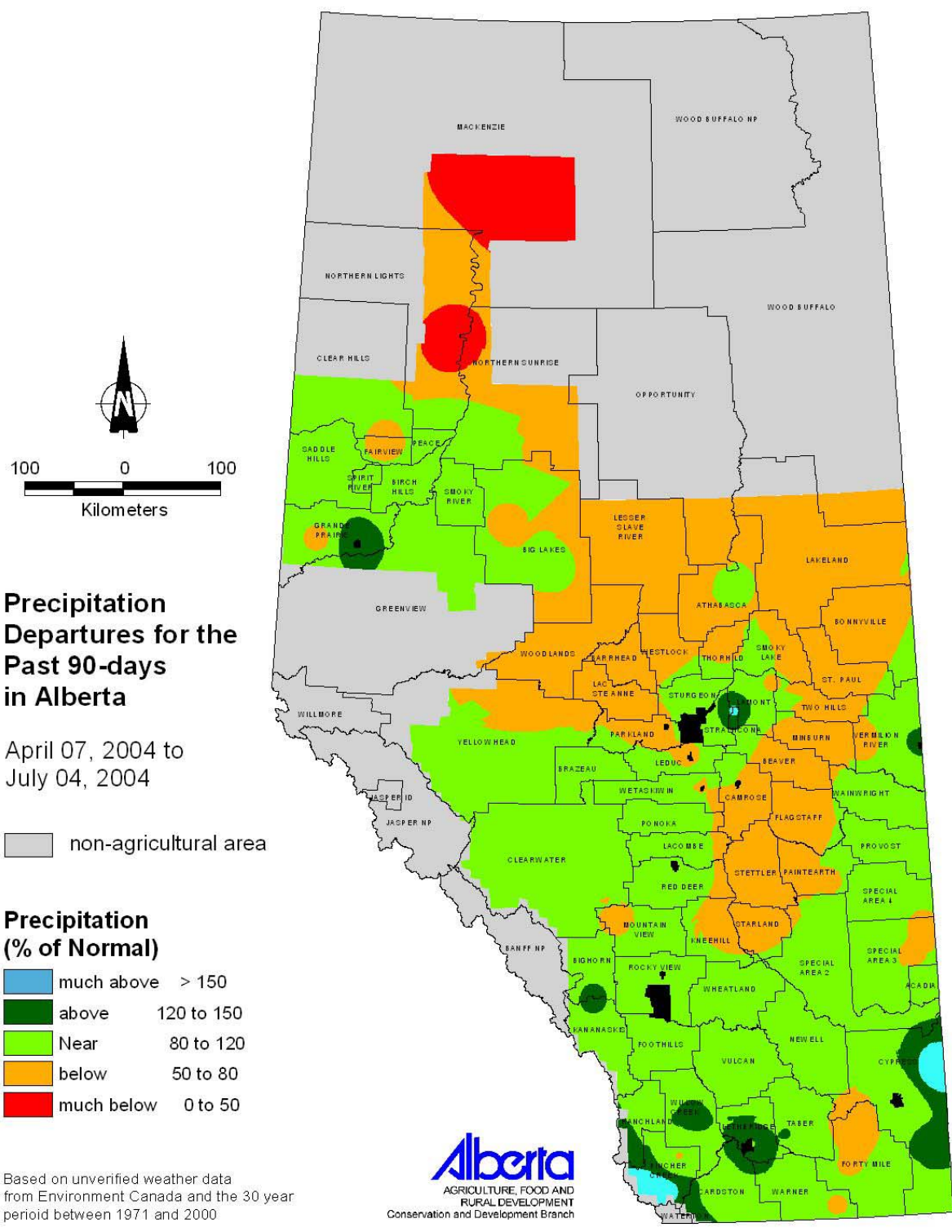


Figure 3. Precipitation departures in the agricultural region of Alberta for past 90 as of July 04, 2004.

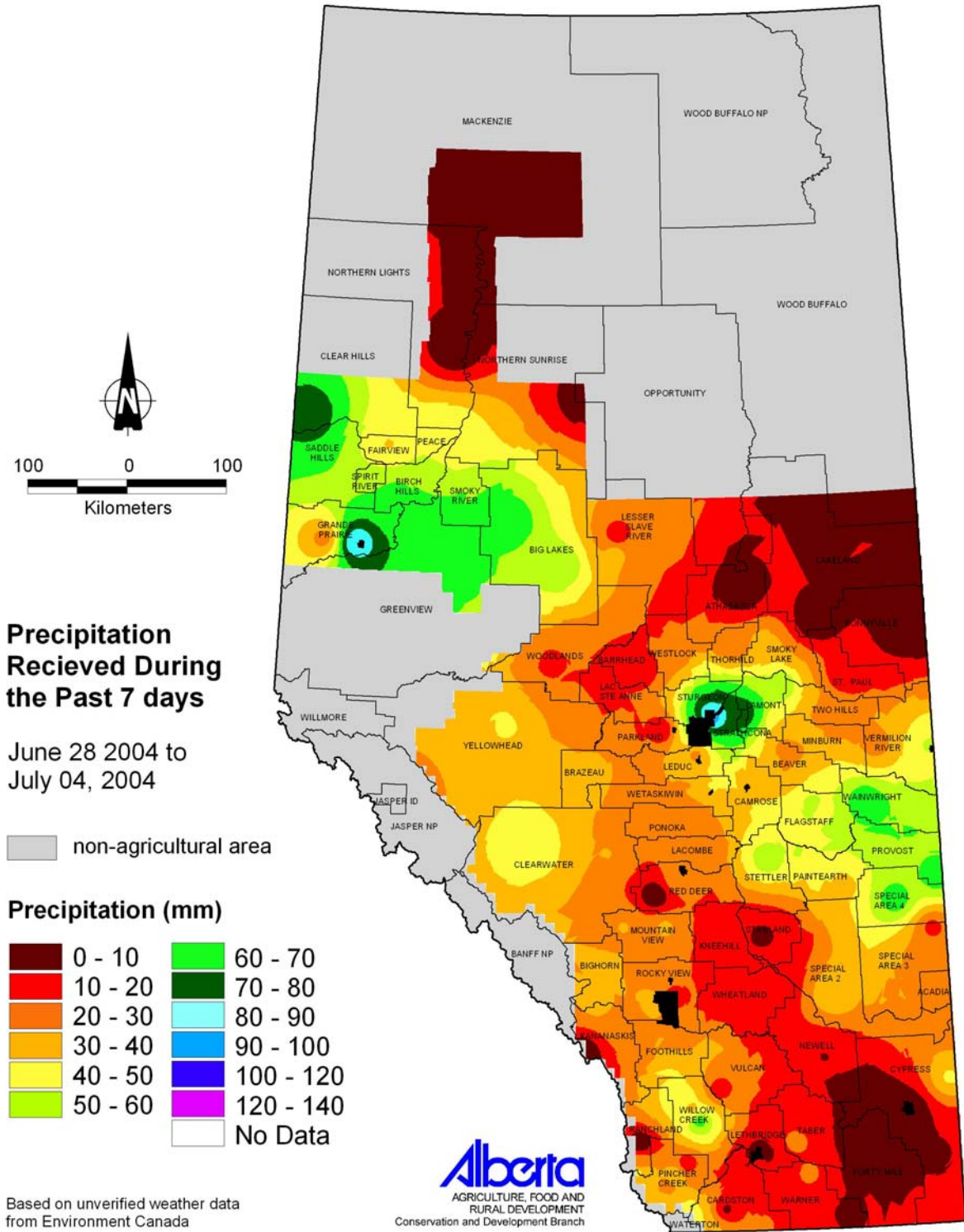


Figure 4. Precipitation (mm) since the last Drought report) as of July 04, 2004 in the agricultural region of Alberta. The last drought report was June 27, 2004.

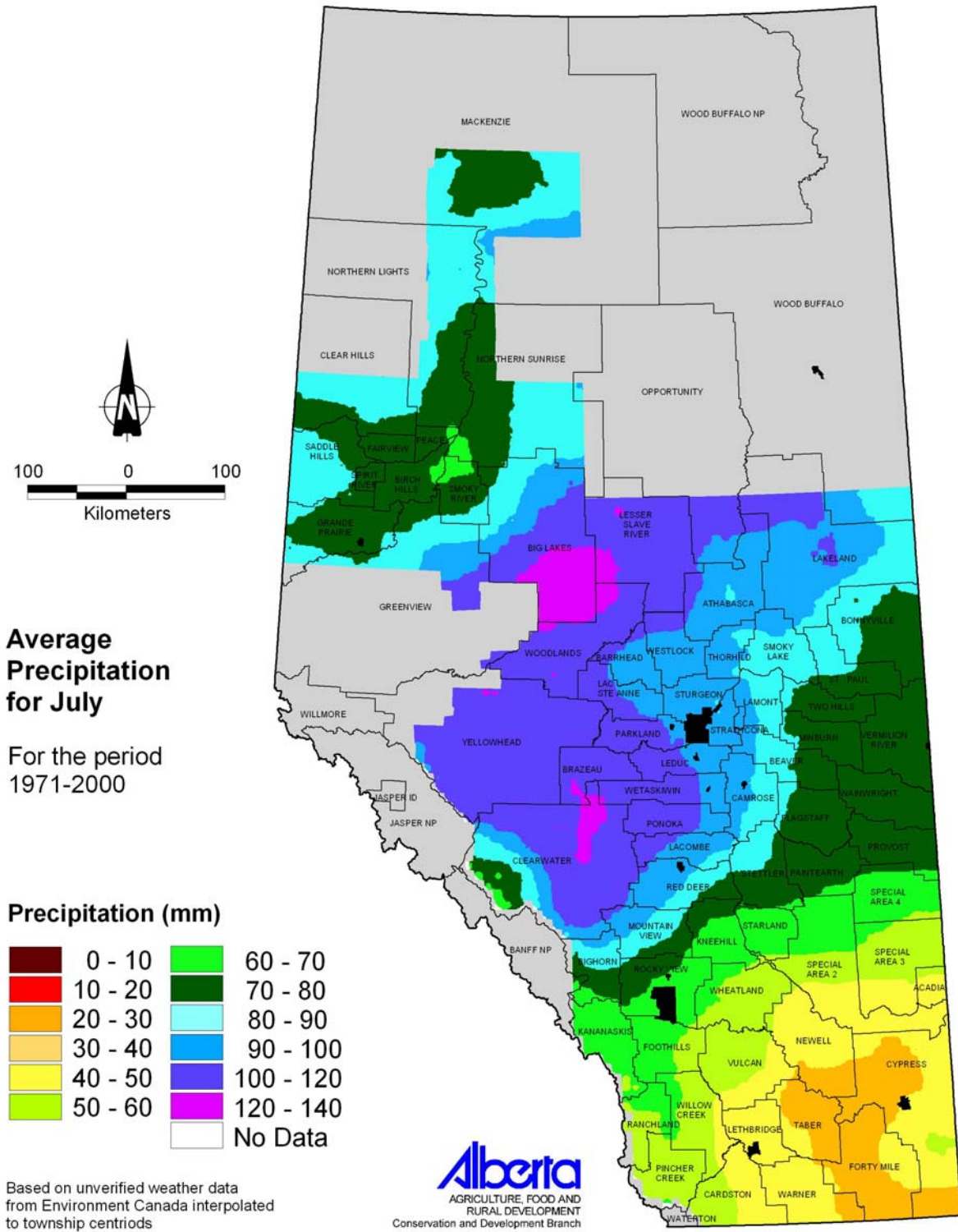


Figure 5. Average precipitation for July in the agricultural region of Alberta based on thirty years of data (1971-2000).

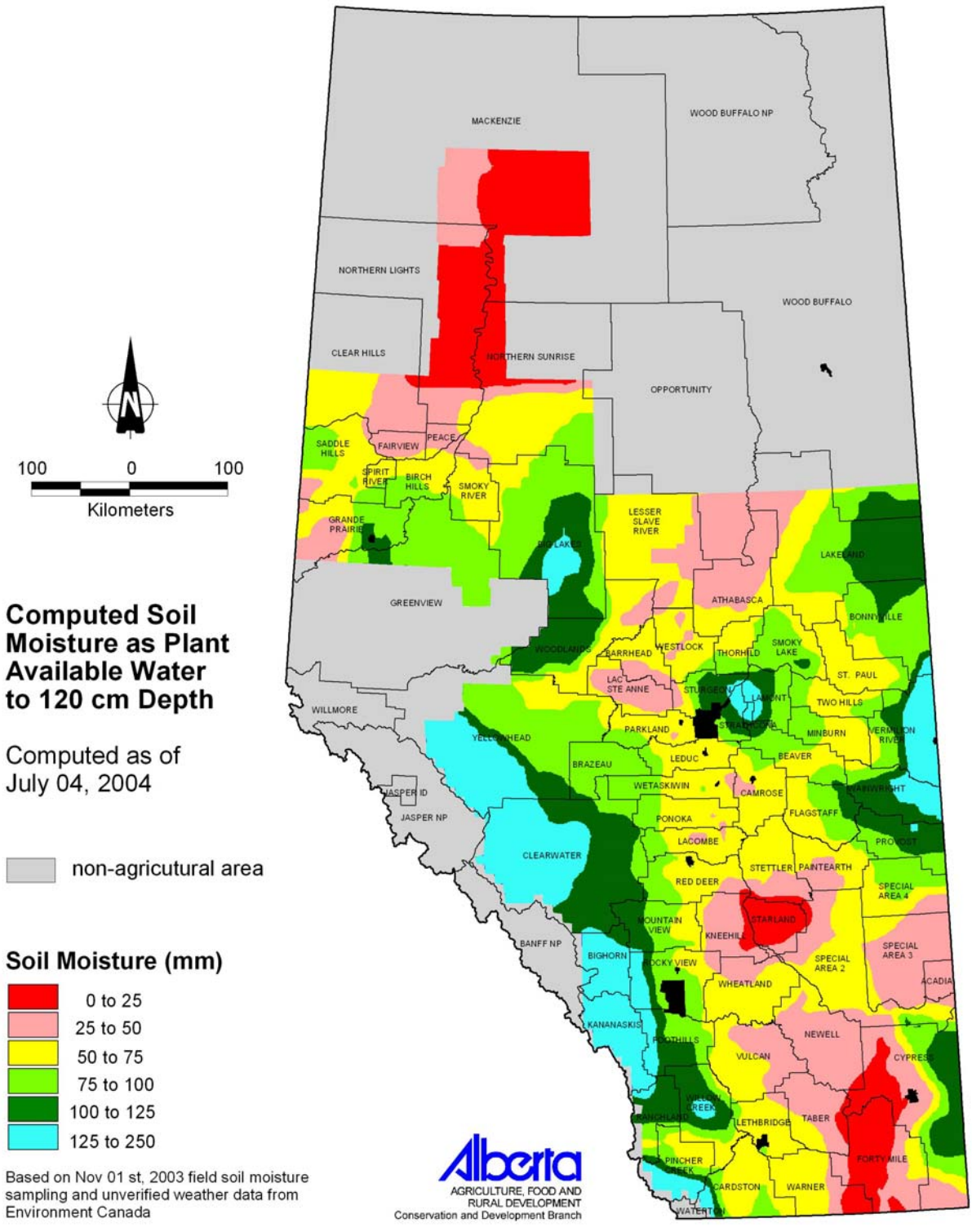


Figure 6. Soil moisture in the agricultural region of Alberta as of July 04, 2004.

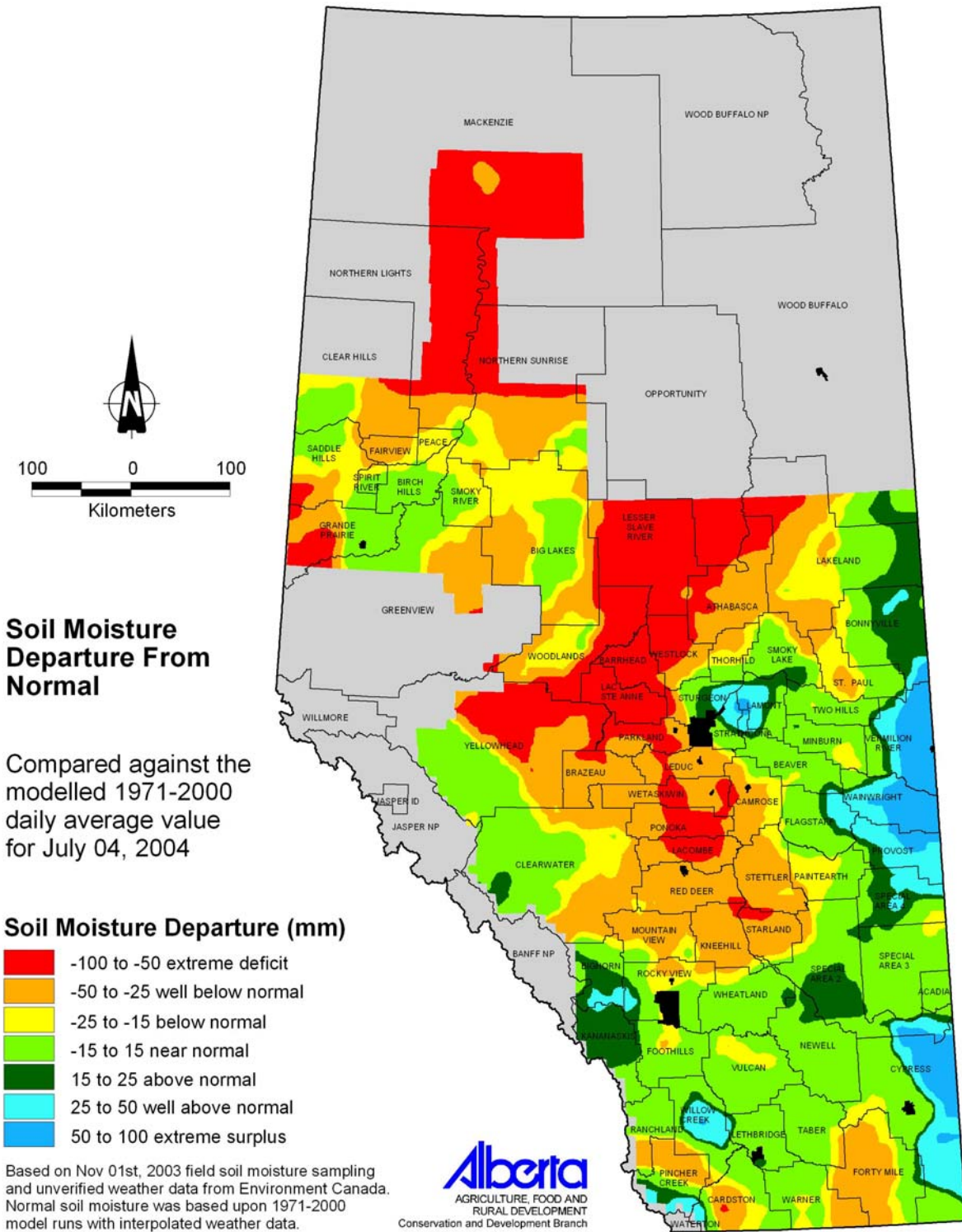


Figure 7. Soil moisture departure in the agricultural region of Alberta from average modeled soil moisture for July 04, 2004.