

# Drought Report for the Agricultural Region of Alberta: August 02, 2004

## Summary

Since the last report (July 18<sup>th</sup>, 2004), scattered thunderstorm dominated precipitation patterns over the reporting area. As a result, some areas may have received more or less precipitation than has been reported here. Total precipitation amounts have ranged from less than 10 mm in the extreme south to as much as 80 mm at some stations (Figure 4). Manning reported 76.2 mm suggesting some relief came to parts of the critically dry north central Peace region. Other areas reporting significant precipitation include both St. Paul (66.0 mm) and Vermillion (73.2 mm) in east central Alberta and Sundry (80.2 mm) in west Central Alberta. Areas receiving less than 10 mm include southwest and south central Alberta. In addition to the northern Peace, south central Alberta may be emerging as a concern as this area too was largely missed by the early July rains that had brought relief to much of the province. In total, over the last 30 days, some weather stations in the counties of Cardston, Warner, Forty Mile and Cypress have reported less than 20 mm of total precipitation.

As a result of the recent precipitation, the areas classified as *Drought* in west central Alberta have disappeared. In east central Alberta, along the boarder between Special Areas 3 and 4, one pocket of *Drought* remains and, similarly in the southwest a small remaining pocket classified as *Drought* still remains in the County of Cardston. Across the reporting area, the locations areas previously classified as *Drought Alert* have decreased in size.

Precipitation during the past 90 days has resulted in a trend toward at least *Normal*, or low risk of *Drought*, for most of the reporting area, 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* and *Drought Alert* 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 parts of southwestern 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 future precipitation deficiencies occur. Most of the Peace region is predicted to have *Well Below Normal* soil moisture conditions with areas of *Extreme Deficit* showing over much of the northern Peace and parts in the extreme southwest, southern and east central 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 continued to decrease and now account for approximately 0.1% of the reporting area. Three small pockets remain in this category one in the county of Starland, one spanning the boarder between Special Areas 3 and 4, and one in the county of Cardston. Of significant note is the fact

that the northern Peace region is not categorized as *Drought* despite the dire need of moisture here. 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 July and August of last year.

- Currently nearly 17% of the reporting area is in *Drought Alert* down from 31% reported in the July 18<sup>th</sup>, 2004 *Drought* report. Recent rains have reduced the *Drought Alert* areas in much of the northern Peace country, as well as northern, central and western Alberta. In southern Alberta the affected areas remain largely unchanged. Currently *Drought Alert* areas include west central Alberta, central Alberta and east central Alberta with some pockets remaining in southwestern and south central Alberta.
- The areas classified as *Normal* have increased significantly and now account for 82% of the reporting area up from 68% as reported 15 days ago in the last *Drought* report.

#### **Recent trends (Figure 2):**

- The area representing recent (90-day) trends toward *Normal* conditions increased since the last report and represents most of the mapped area. Since 17% of the province was in *Drought Alert* status, this represents a trend toward improvement in most of the affected areas
- The 90-day trend towards *Drought Alert* remains in the northern Peace region and affects the M.D. of Mackenzie, and the northern eastern corner of the M.D. of Northern Lights. 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, Figure 5 and Figure 6):**

- Most of the northern half of the Peace region has received at least *Below Normal* precipitation with the exception of the M.D. of Mackenzie and the northeastern tip of the M.D. of Northern Lights, which have received *Well Below Normal* precipitation. In the previous report, much of the northern Peace region including M.D.'s of Mackenzie, Northern Lights and Northern Sunrise, as far south as Manning have received *Much Below Normal* precipitation over the previous 90 days. Currently, the map shows that the *Much Below Normal* category has receded significantly. However since weather stations are sparse in this area, this observation is based on observations from a single station, located at Manning that recently received 76.2 mm. As a result of recent thunderstorm activity, some areas may be better or worse than what has been depicted on the map. In other areas of the peace, *Below Normal* precipitation was recorded in a small pocket in the County of Grande Prairie, centered on Beaver lodge and also in most of the northwestern portion of the M.D. of Lesser Slave River. In the rest of Alberta, areas receiving *Below Normal* precipitation include east central Alberta including the counties of Minburn, Beaver, Flagstaff, Camrose, Ponoka, Lacombe, Stettler and Paintearth. Other isolated pockets can be found throughout central Alberta including an area surrounding the town of Andrew, as well as in the counties of Clearwater, Starland and one spot straddling the boarder between Special Areas 3 and 4 at the town of Esther. In the south, three main pockets of *Below Normal* can be found, one each in the County of Forty Mile, Warner and Cardston. *Normal* precipitation was recorded in most of the rest of Alberta with Grand Prairie and some areas

in the southwest and southeast recording *Above Normal*. *Much Above Normal* precipitation was recorded in the County of Cypress near the town of Shuler (Figure 3).

- Since the last report (July 18<sup>th</sup>, 2004) isolated showers delivered varying amounts of precipitation (0-80 mm) over the province. Total precipitation amounts ranged from less than 10 mm in the extreme south to as much as 80 mm at a few of the reporting stations. Manning reported 76.2 mm suggesting some relief came to parts of critically dry north central Peace region. Other areas reporting significant precipitation include both St. Paul (66.0 mm) and Vermillion (73.2 mm) in east central Alberta and Sundry (80.2 mm) in west central Alberta. Areas receiving less than 10 mm include parts of southwest and south central Alberta. Of these areas of particular note is an area in south central Alberta where early July rains were light compared to the rest of the province. Those areas receiving less than 20 mm since the last report will need precipitation shortly in order to maintain existing yield potentials (Figure 4).
- Precipitation for the month of July was at *Near Normal* or greater for most of the province. Exceptions include the northern Peace in the M.D. of Mackenzie where *Much Below Normal* precipitation was recorded. In southern Alberta, parts of the M.D. of Pincher Creek and the Counties of Cardston and Warner also reported *Much Below Normal* Precipitation. Areas reporting *Below Normal* include the northeast corner of the M.D. of Northern lights in the Peace, parts of Lakeland County and the Regional Municipality of Wood Buffalo in northern Alberta. In the north west, several areas of *Below Normal* exist, the largest affecting the counties of Clearwater, Red Deer Lacombe and Ponoka, as well as several other smaller pockets scattered through the area. In the south, *Below Normal* was recorded in the M.D. of Pincher Creek and the Counties of Cardston, Warner, Forty Mile and Cypress (Figure 5).
- August generally marks an end to the heavy rainfall season in most of Alberta, with total amounts ranging from 30 mm in the southwest up to 100 mm in the northwest and southeastern Peace region (Figure 6). This compares to ranges of 30–140mm for July and 50-140 mm for June. Given current soil moisture conditions a return to *Normal* precipitation patterns 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 insure good crop growth.

**Soil Moisture (Figure 7, Figure 8 and Figure 9):**

- Soil moisture levels were less than 50 mm of plant available water for most of the east half of the province with the exception being the northeast portion of the province. Almost the entire Peace region was predicted to have less than 50mm of plant available water. Within these areas, at least half had soil moisture reserves of less than 25mm. A situation requiring precipitation in the next week or so to maintain current crop conditions (Figure 7). 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 8).
- Soil moisture levels are in *Extreme Deficit* for much of the northern and the extreme southwest portions of Peace region, a condition that has improved slightly since the last report (July 18<sup>th</sup>). However, this result is based on precipitation data recorded at a single

location (Near Manning). Locations currently experiencing areas with extreme soil moisture deficits in the Peace are the M.D.'s of Mackenzie, Northern Sunrise, Saddle Hills, Green View and the county of Grand Prairie. In the north half of Alberta, isolated pockets in this category can be found in the Counties of Lakeland, Woodlands, Yellowhead, Ponoka and Lacombe. Two small areas in the south can also be found in the M.D. of Pincher Creek and the County of Cardston. *Well Below Normal* moisture reserves are predicted to be present for most of the Peace region and parts of northern Alberta including the M.D. of Lesser Slave River and the Counties of Athabasca and Lakeland. Most of the North West is also experiencing *Well Below Normal* soil moisture reserves. In the south *Well Below Normal* soil moisture reserves can be found in the M.D. of Pincher Creek and Cardston and Warner counties. The rest of the reporting area is mostly classified as having *Normal* soil moisture reserves, save for fringe areas boarding the *Well Below Normal* category where reserves are *Below Normal* and in the extreme northeast, east central and southeast where some counties are experiencing *Well Above Normal* to *Extreme Surplus* (Figure 9).

## 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 of  $-2$  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

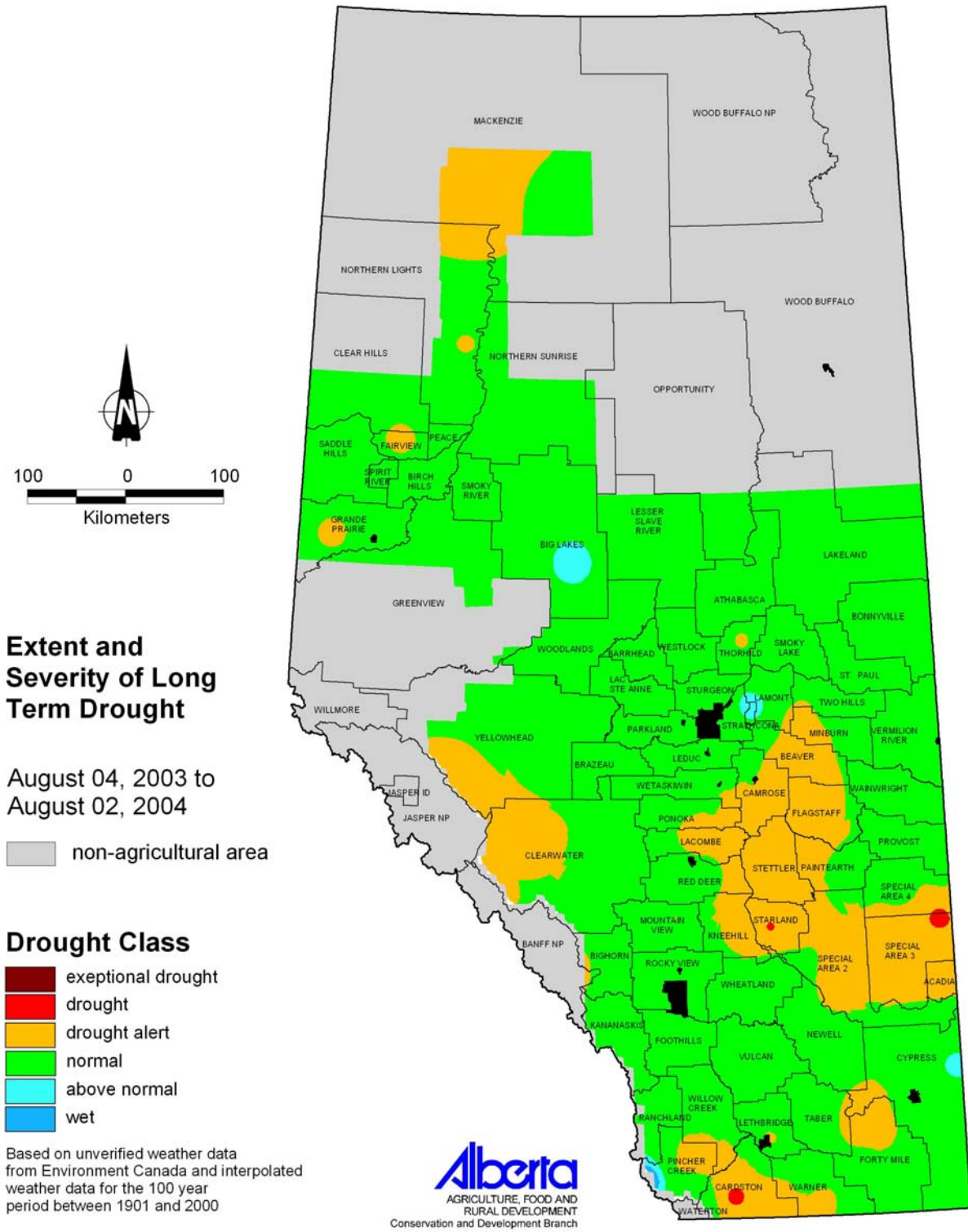
Ralph Wright , Allan Howard, Katherine Altman and Kris Sabourin

Conservation & Development Branch & Program

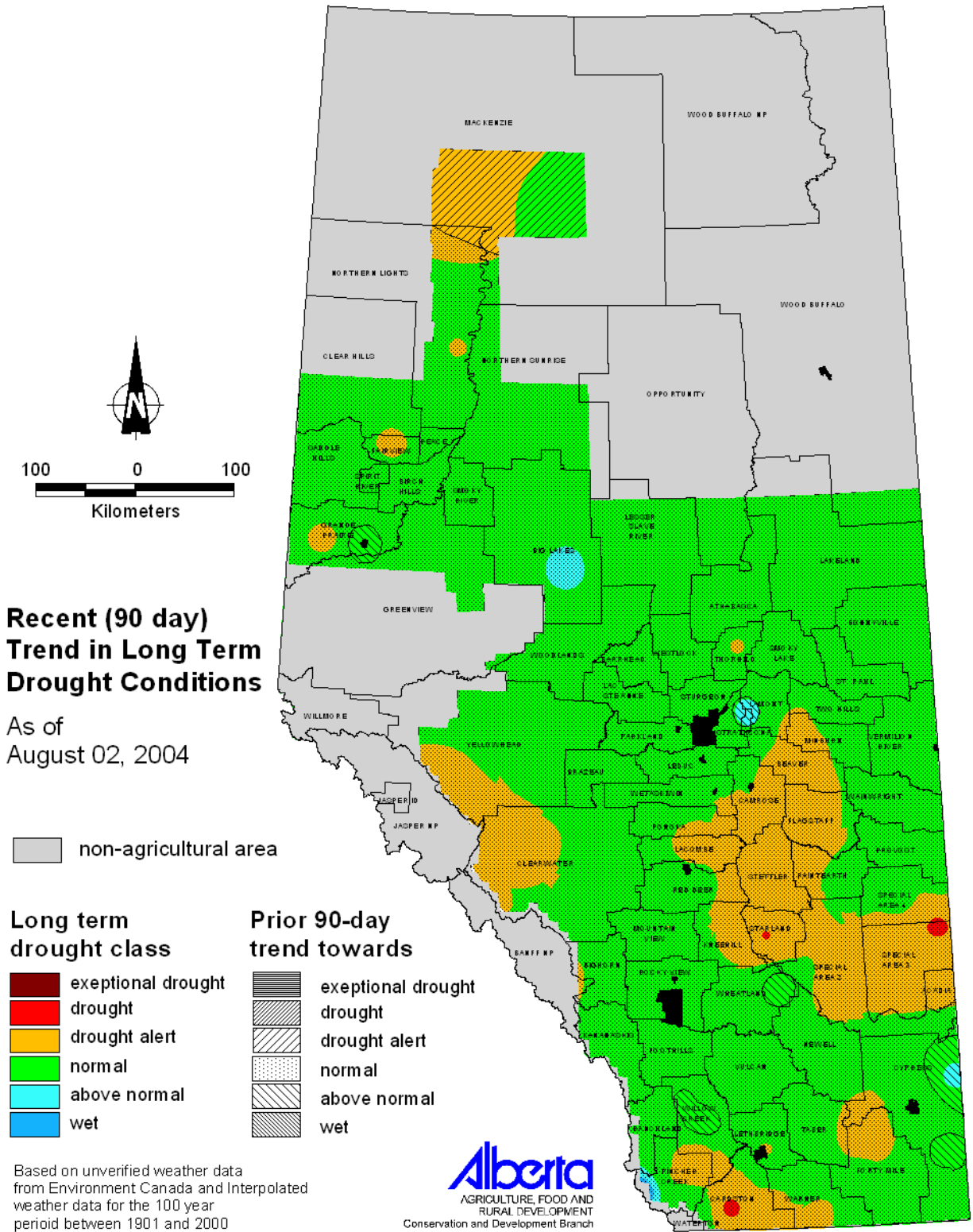
Alberta Agriculture, Food and Rural Development, Edmonton, AB T6R 5T6

Contact: Ralph Wright; ph (780) 427-3556 This report was created on August 2<sup>nd</sup>, 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 18<sup>th</sup>, 2004.

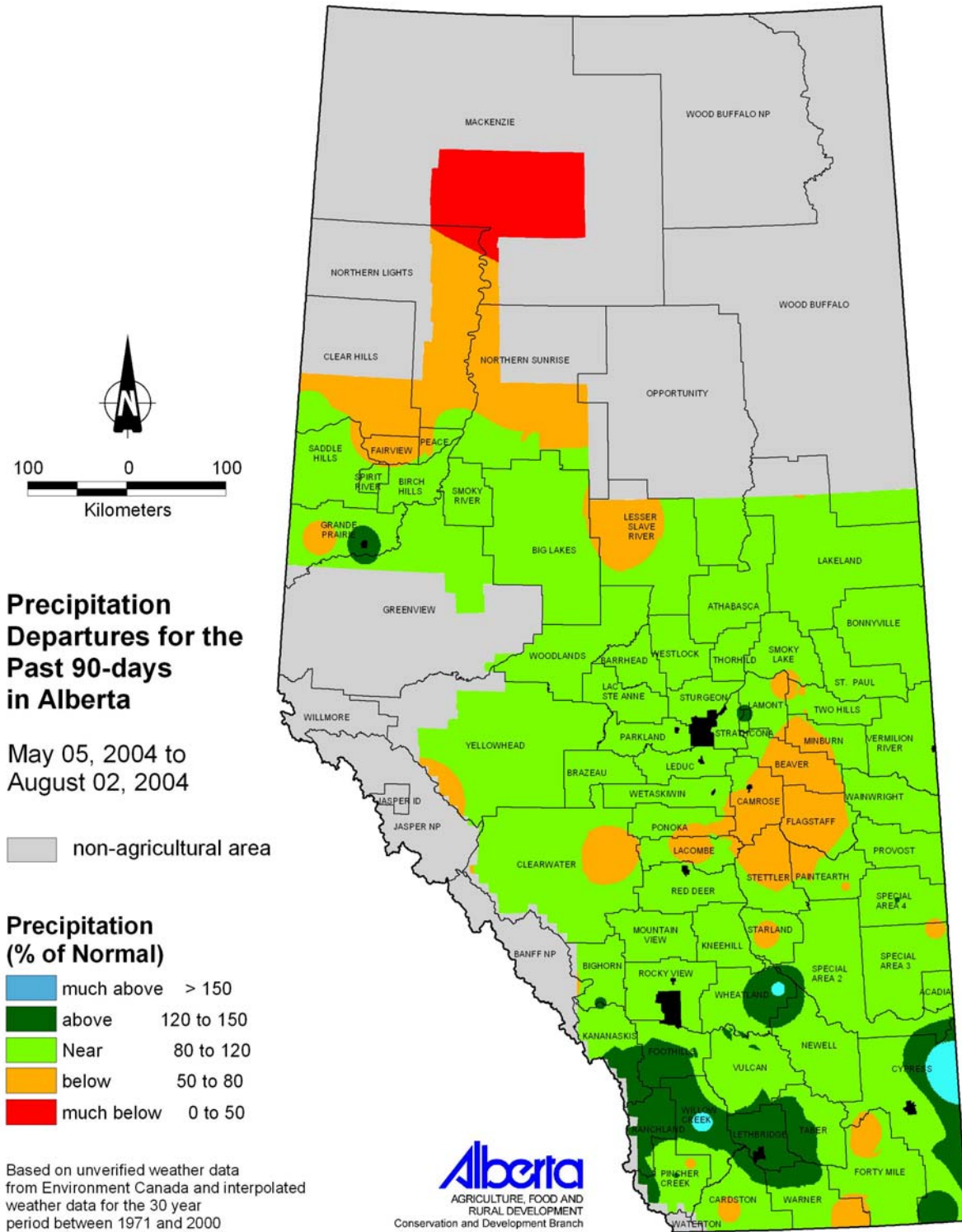


**Figure 1. Extent and severity of long-term Drought in the agricultural region of Alberta, as of August 02, 2004.**



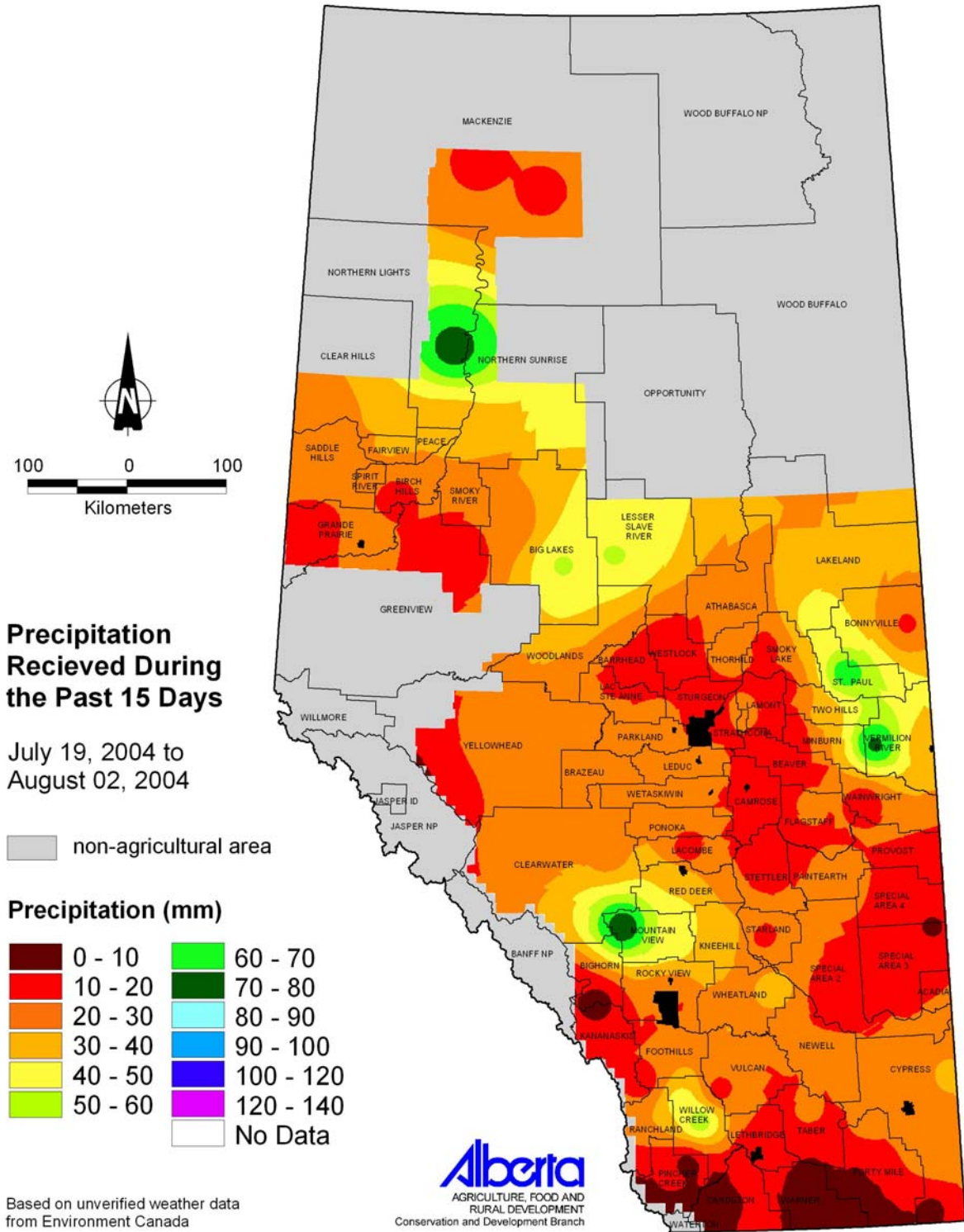
**Figure 2. Recent (90 day) trends in Drought conditions for the agricultural region of Alberta, as of August 02, 2004.**





**Figure 3. Precipitation departures in the agricultural region of Alberta for past 90 days as of August 02, 2004.**





**Figure 4. Precipitation (mm), since the last Drought report, as of August 02, 2004 in the agricultural region of Alberta. The last Drought report was July 18, 2004.**

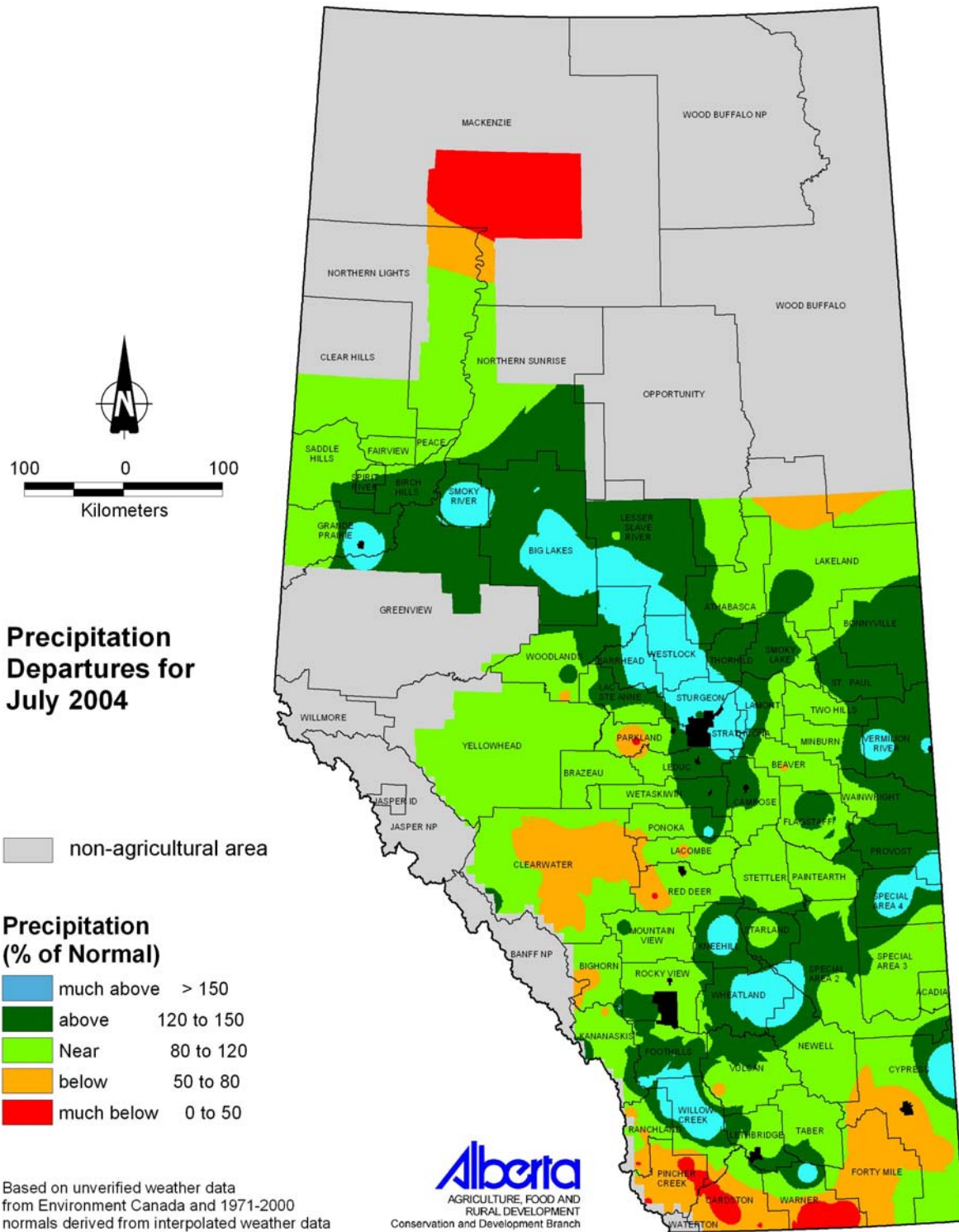
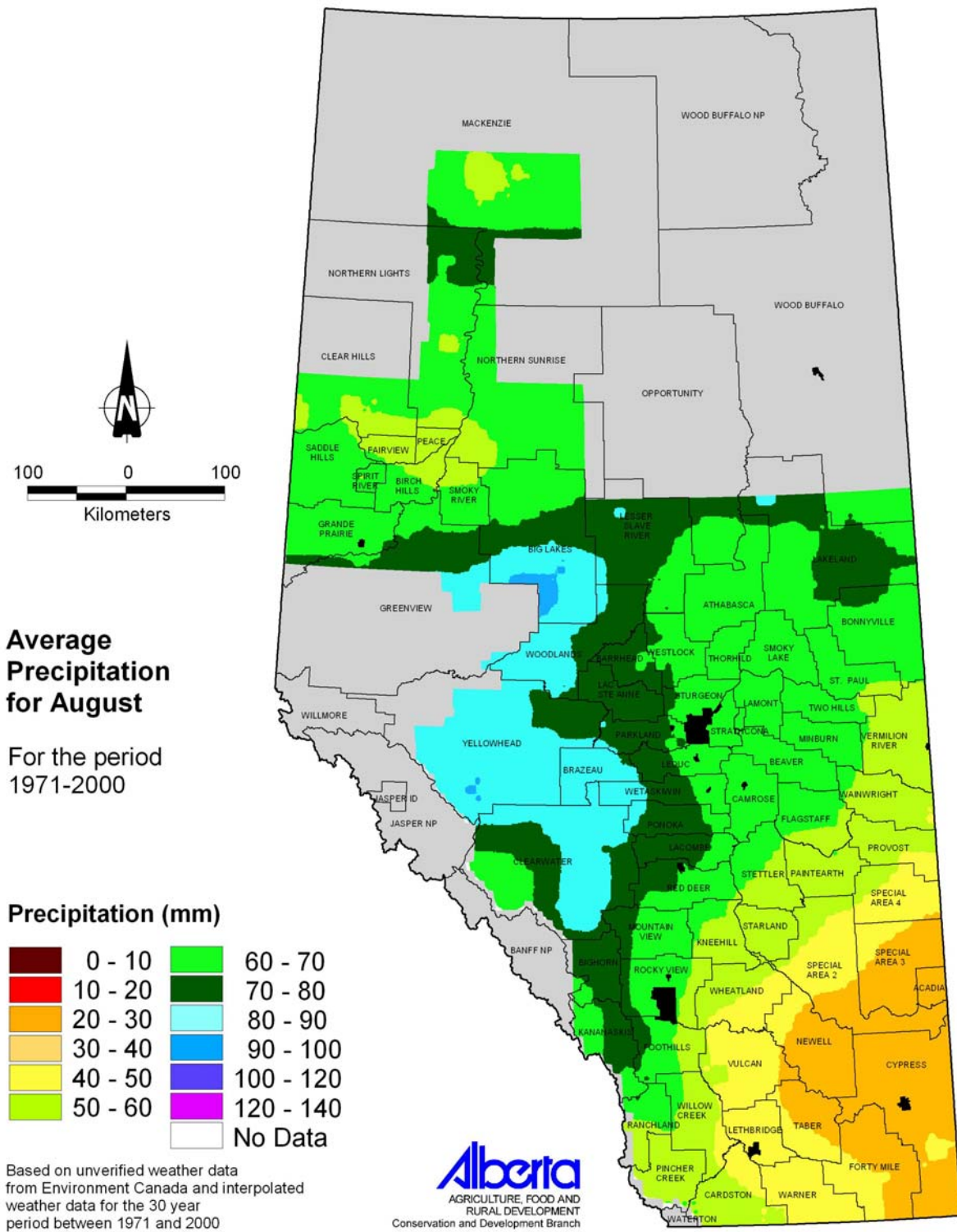


Figure 5. Precipitation departures from 30-year normals (1971-2000) for July 2004.



**Figure 6. Average precipitation for August in the agricultural region of Alberta based on thirty years of data (1971-2000).**



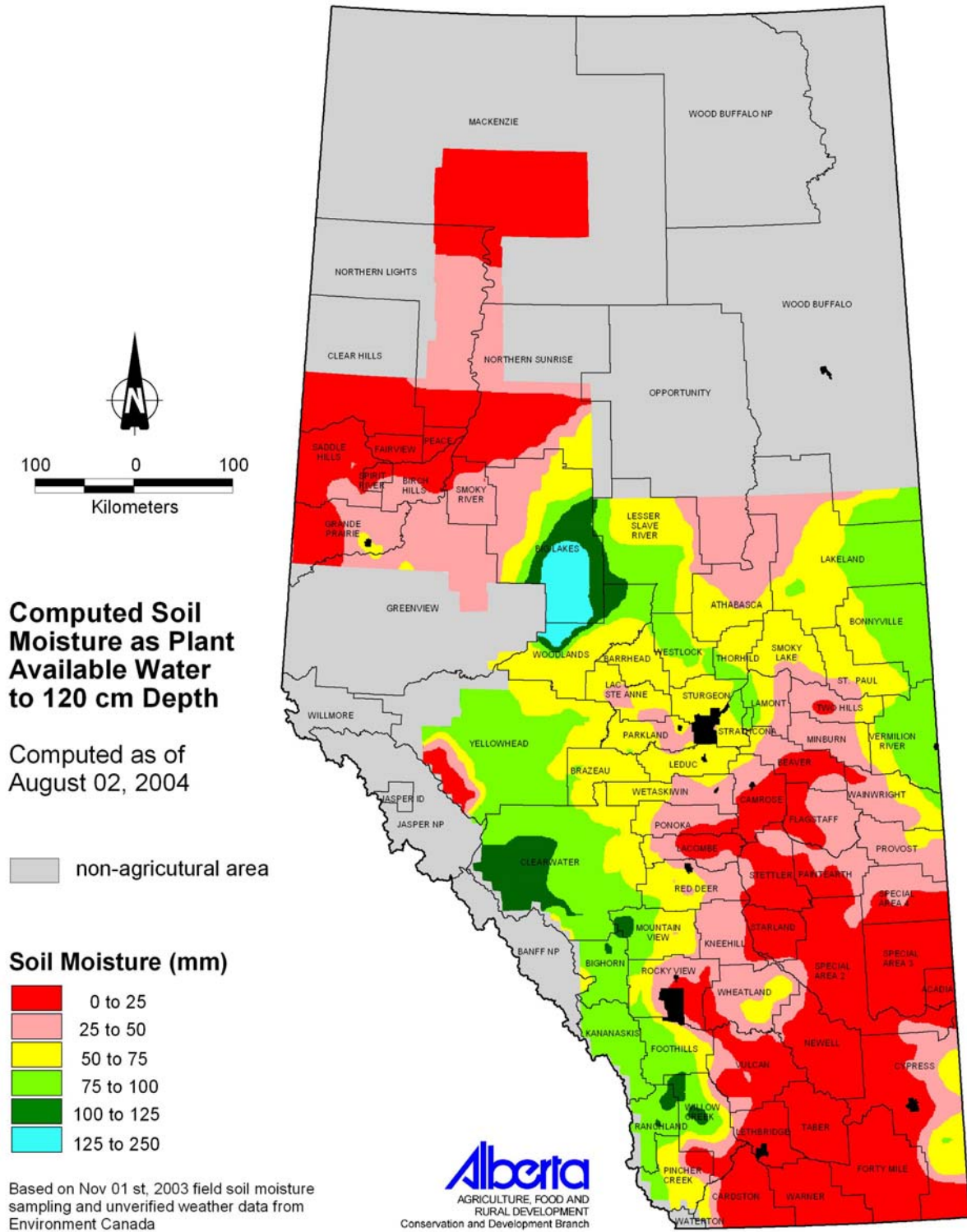


Figure 7. Soil moisture in the agricultural region of Alberta as of August 02, 2004.

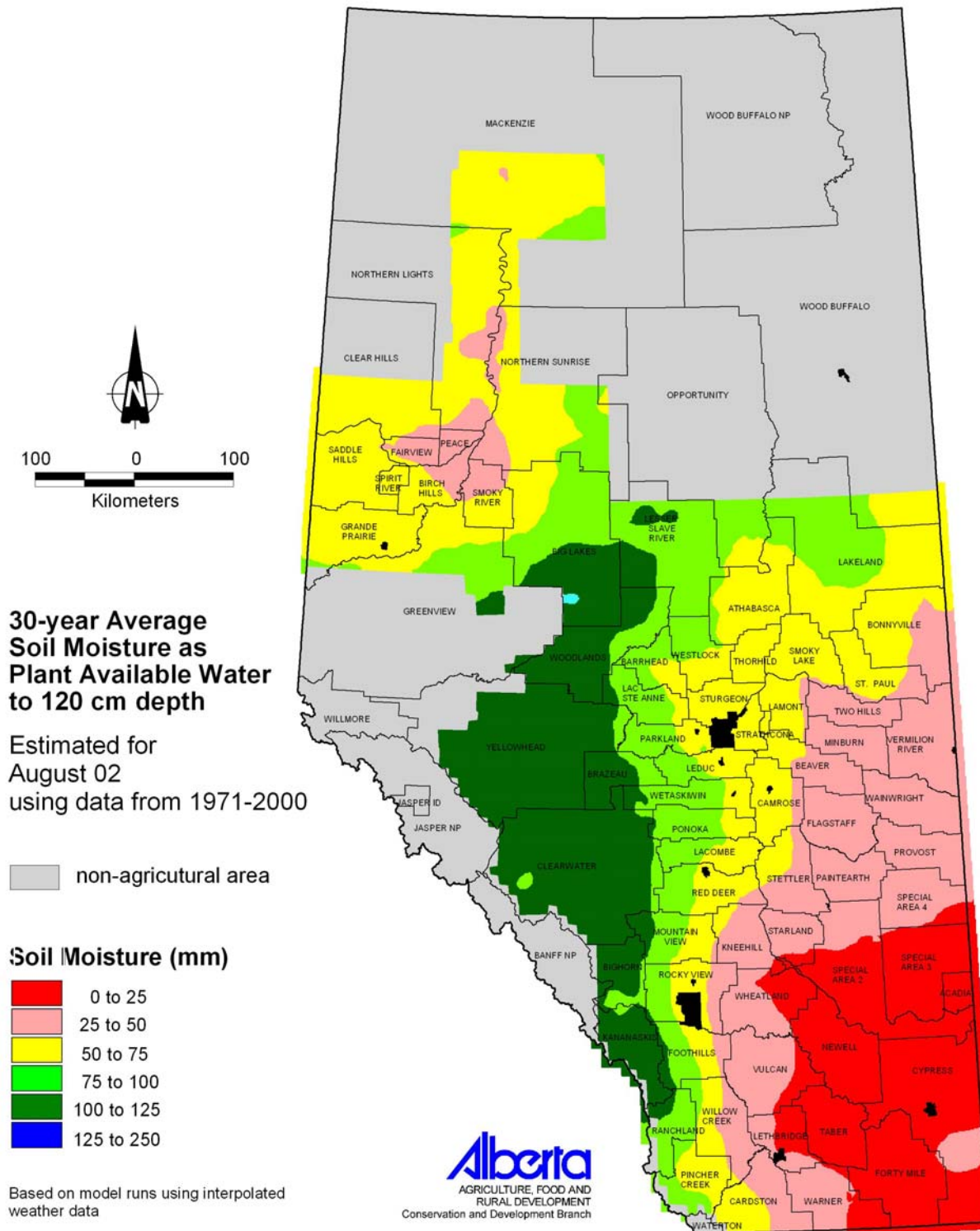
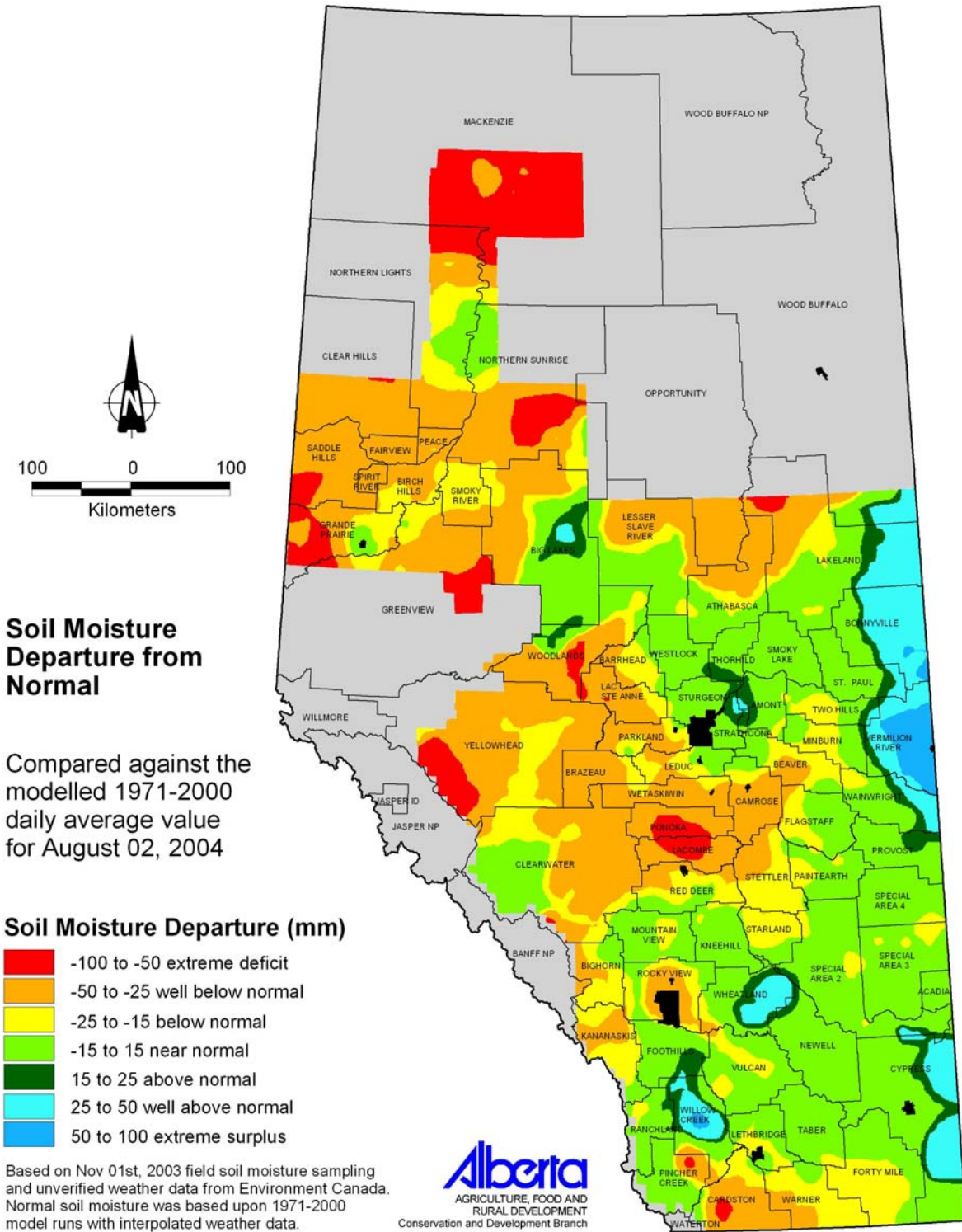


Figure 8. Modeled 30-year average soil moisture conditions for August 2<sup>nd</sup>.



**Figure 9. Soil moisture departure in the agricultural region of Alberta from average modeled soil moisture for August 02, 2004.**