

Drought Report for the Agricultural Region of Alberta: May 1, 2004

Summary

Precipitation for the month of April was *Much Below Normal* for most of the southeastern half of the province. *Below normal* precipitation was recorded for much of the rest of the province excluding the Edmonton to Red Deer corridor, parts of northern Alberta and the central Peace regions. Continued dry weather in the southwestern portions of the province intensified the *Exceptional Drought* areas and in the central portions a major area in *Drought* emerged. In the south and the east half of the province, continued dry weather has increased the size of *Drought* areas. Long-range forecasts were for above normal temperatures and below normal precipitation for the next six months, however the *Drought* situation in the northwestern U.S. is expected to improve through May, which could benefit southern Alberta slightly.

Current Situation

Long-term *Drought* (Figure 1):

- The mapped reporting area was widened since the last report and now includes more of the northern and western portions of Alberta and more of the Peace region. Areas in the *Drought* class increased significantly especially in central Alberta and now include Special Areas 3 and 4 and most of the Counties of Starland, Kneehill, Stettler, Lacombe and parts of Counties of Red Deer, Mountain View and Clearwater. The southwestern portion of the province also shows increases in the *Drought* class and some developing pockets of *Exceptional Drought* can be found in the M.D.'s of Pincher Creek, Willow Creek, and the Counties of Cardston, Starland and Cypress. In total, 11% of the reporting area is classified as *Drought* and 0.3% is classified as *Exceptional Drought*. Areas in *Drought Alert* include most of southern, central and western Alberta and the western Peace region. Currently 45% of the reporting area is in the *Drought Alert* category. Approximately 43% of the reporting area is classified as *Normal* and includes northeastern Alberta, the east half of the Peace region and in the south, the north half of Cypress County and some isolated pockets in the County of Newell, Warner and the M.D. of Taber.

Recent trends (Figure 2):

- Recent (90 day) trends toward *Normal* conditions (-0.5 to 0.5) were experienced in most areas of the Peace and northern Alberta.
- Areas trending toward *Drought Alert* status (-1 to -2) include most of the southern half of the province extending up to the town of Camrose and much of the western portions of the province, extending up to the County of Grande Prairie. Also included in this category are the Counties of Two Hills, Minburn and Beaver. Of these areas, those in *Drought Alert* status are expected to stay in *Drought Alert* status, and those not in *Drought Alert* are expected to move into *Drought Alert* status if current conditions persist.
- Some pockets in the south are trending toward *Drought* status (-2 to -3) and include Special Areas 3 and 4, the Counties of Cypress, Forty Mile and the M.D. of Pincher Creek. Those areas already in *Drought*, are showing no indication of changing.
- Both the Counties of Cypress and Forty Mile each contain an isolated pocket trending towards *Exceptional Drought* (< -3). This is a clear indication that very dry conditions are persisting in these areas.

Precipitation (Figures 3 – 6):

- Precipitation in the past 90 days (since February 1st) was *Much Below Normal* for most the southern half of the province. Other areas in this classification include the Counties of Two Hills, Minburn Beaver, Flagstaff, Woodlands and Clearwater. *Below Normal* precipitation was recorded for the rest of the province save for the east half of the Peace and the central parts of northern Alberta including the city of Edmonton, where precipitation departures ranged from *Near to Much Above Normal* (Figure 3)
- Based on climate normals, April is a relatively dry month with the bulk of the province receiving between 10-30 mm. During this time, the south and western portions the province, along the foothills, typically receives the most precipitation, between 30 and 50 mm (Figure 4)
- Most of the precipitation recorded since the last report (March 31st, 2004), Figure 5, fell during the latter half of April. Much of it occurred as a spring snowstorm from April 12th to 16th. Localized areas east of Edmonton and west of Calgary and in the M.D. of Lesser Slave Lake recorded the most precipitation (>40 mm). Much of the province received between 10 and 30 mm with 20-30 mm falling in the southwestern portion of the province. Other areas hit by the storm included the Peace River region, the west central and western half of the province, all receiving between 10 and 20 mm of precipitation. Less than 10 mm was recorded in the south and eastern half of the province. For most areas of the province, precipitation for the month of April was *Below to Much Below Normal* (Figure 6).
- Departures are based on Environment Canada verified data through September 2003, and unverified data from October 2003 through March 2004.

Outlook

Precipitation forecasts (Figure 7):

- Environment Canada predicts *Below Normal* precipitation from March through May 2004.
- Temperatures from March through May 2004 are predicted to be *Below Normal* north of Edmonton and near normal in the south.

Explanation of Terms

Seasonal *Drought* (reported during the growing season months only)

Seasonal *Drought* is only reported for two periods, the growing season (May 1 – August 31) and the fall (Sept 1 – October 31). Seasonal *Drought* during the growing season impacts annual crops, hay and pastures but does not necessarily affect livestock water supply. Seasonal *Drought* during the fall can affect hay and pastures. It also affects livestock water supply in the following year by reducing the potential for spring runoff. The ratings are based on the current soil moisture conditions and precipitation departures. Seasonal *Drought* is rated as *Normal*, *Drought Alert* or *Drought*.

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.

Precipitation Trends¹

Long-term cumulative precipitation departures are generated monthly to assess the long-term water status at representative stations in all five regions of the agricultural area of Alberta. Cumulative monthly total precipitation was compared to *Normal*, starting from an arbitrary reference point of January 2001. These departures provide information on how effective recent precipitation trends are in restoring conditions to *Normal*, given that we have had several months of *Below Normal* precipitation.

This helps understand what amount of rainfall is required to offset the *Drought* and dry weather since 2001. When the line slopes down, the precipitation is *Below Normal*. When the line slopes up, precipitation is *Above Normal* and when the line is flat, precipitation is *Near Normal*. From this information, short-term periods of *Normal* or *Above Normal* precipitation can be put into perspective with the cumulative effect of conditions since January 2001. For example, in southern Alberta, since the heavy rains in June 2002, precipitation dropped sharply from *Normal* at Cardston, but remained *Near Normal* at Medicine Hat until the summer of 2003. The effect of the dry summer of 2003 can be seen in the steeply sloping lines at most stations in all regions. In the southern Peace region, the flat lines indicate a return to *Near Normal* precipitation during August 2003, however the cumulative total since 2001 is still *Below Normal* for all stations except Ballater.

Report prepared by the Drought Reporting Team

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This report was created on May 1, 2004.

Drought analysis is scheduled at monthly intervals between November 1 and April 30. This report updates the previous report of April 18th, 2004.

¹ Precipitation analysis was based on Environment Canada data, with recent data unverified. Amounts may change as data becomes verified.

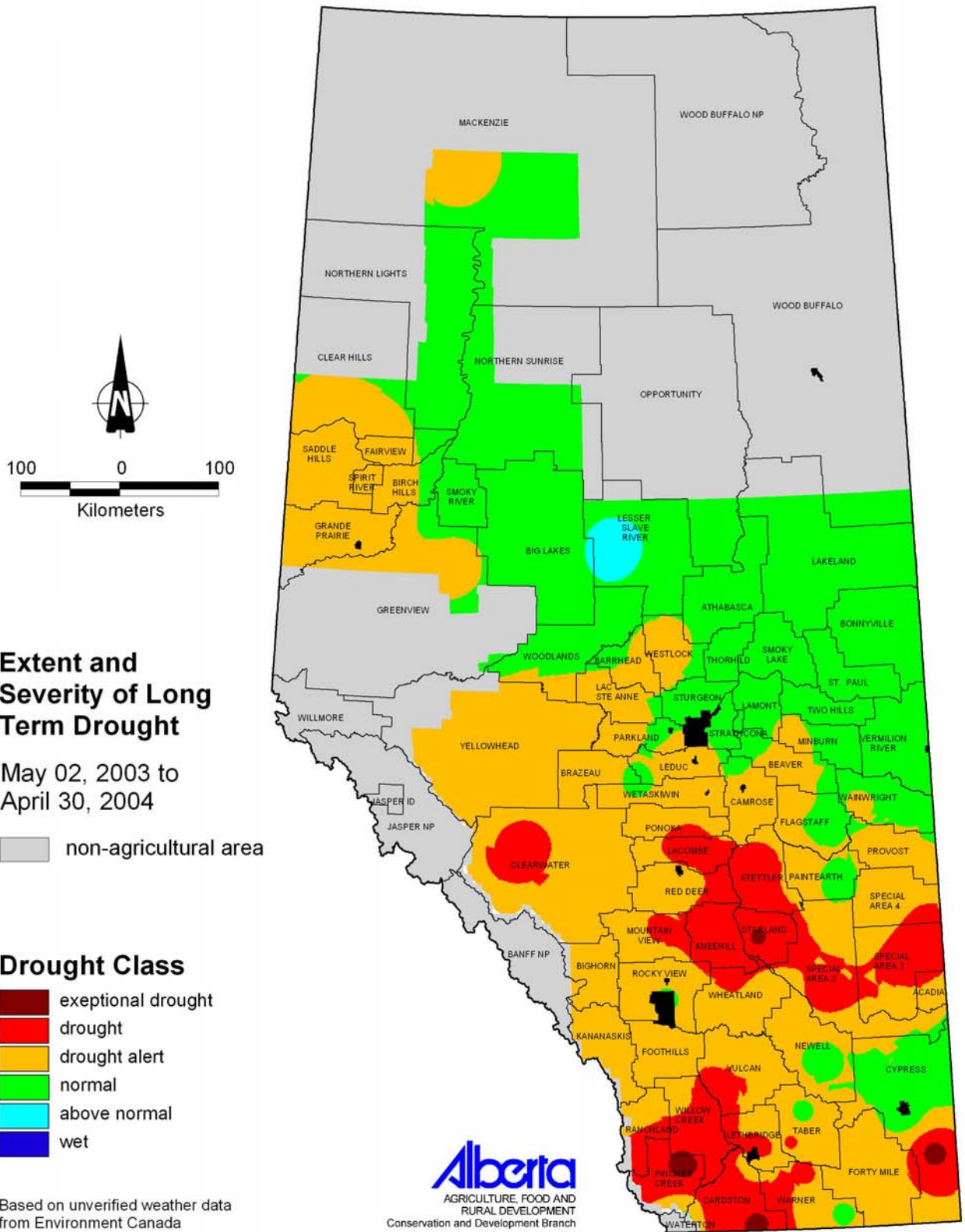


Figure 1. Extent and severity of long-term drought in the agricultural region of Alberta, April 30, 2004.

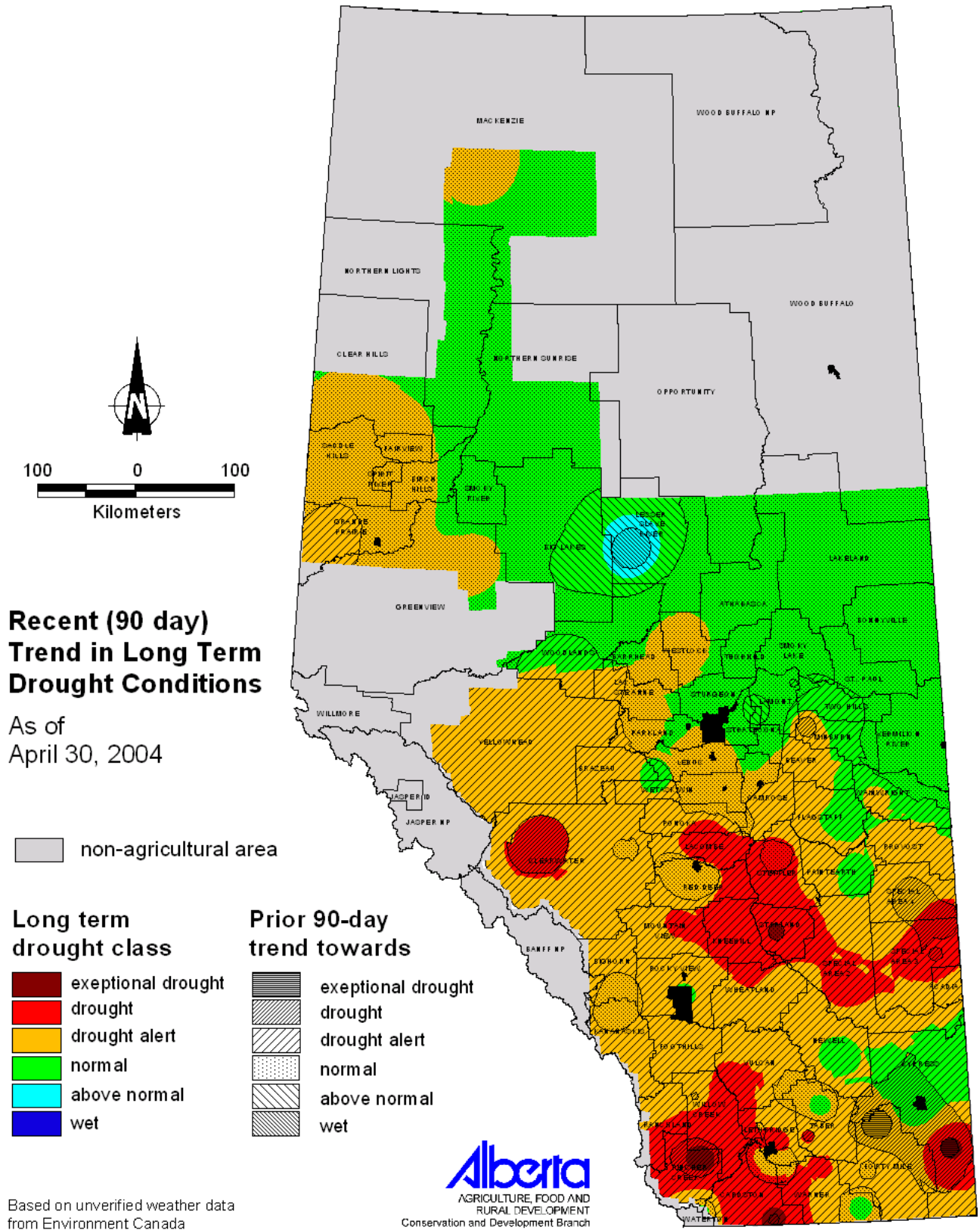


Figure 2. Recent (90 day) trends in drought status in the agricultural region of Alberta, April 30, 2004.

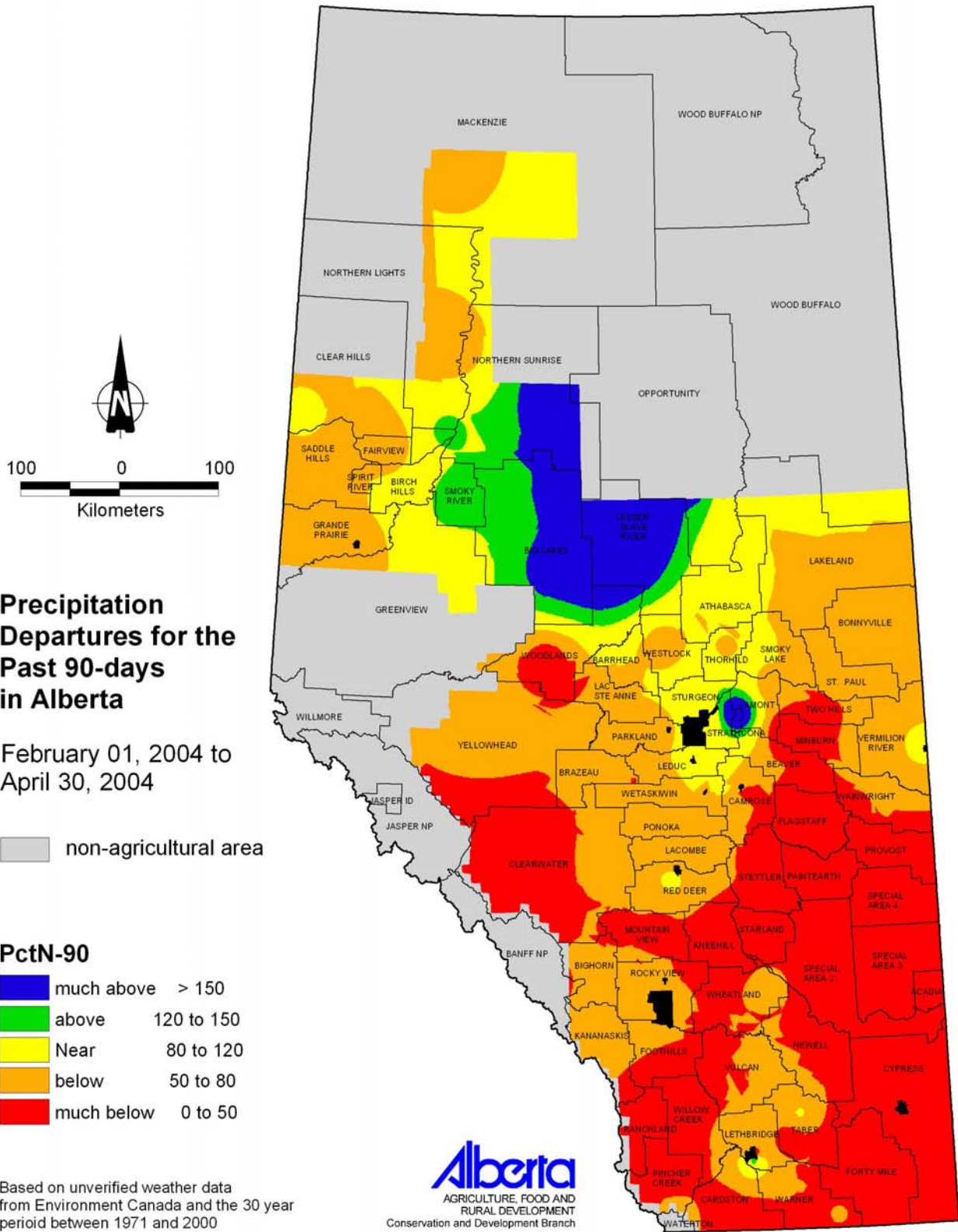


Figure 3. Precipitation departures for the 90 days up to April 30, 2004.

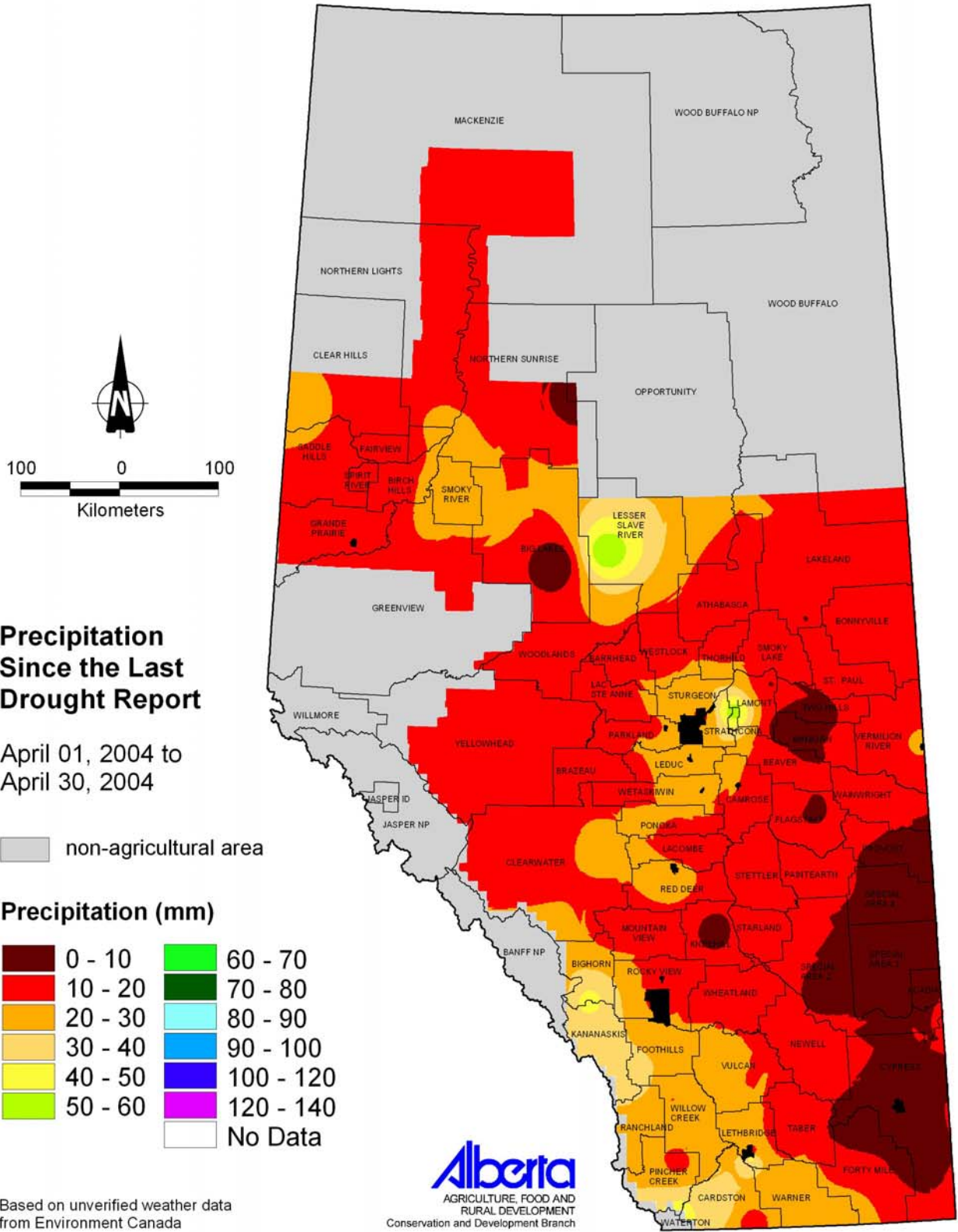


Figure 4. Total Precipitation (mm) for April 2004.

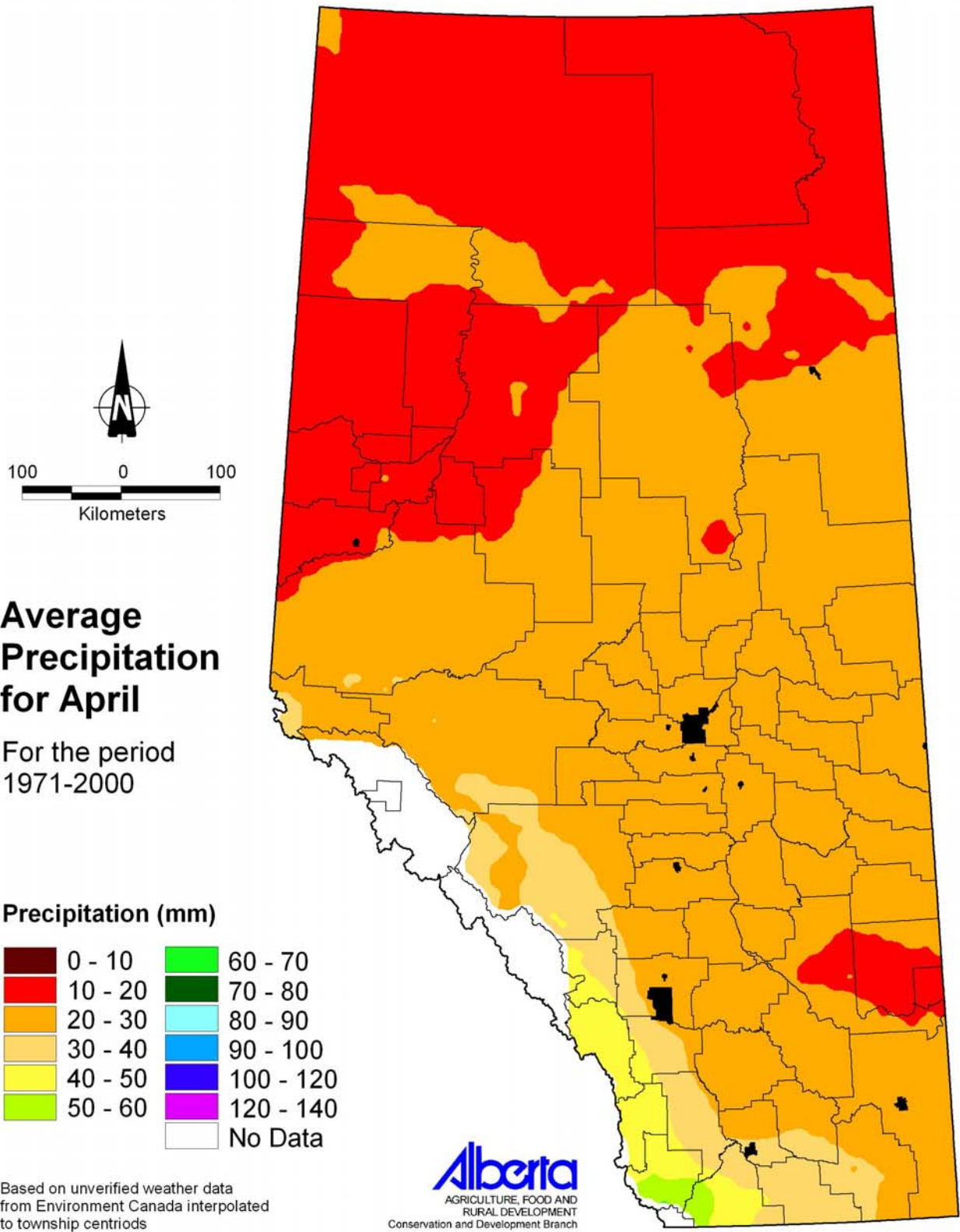


Figure 5. Normal precipitation for April.

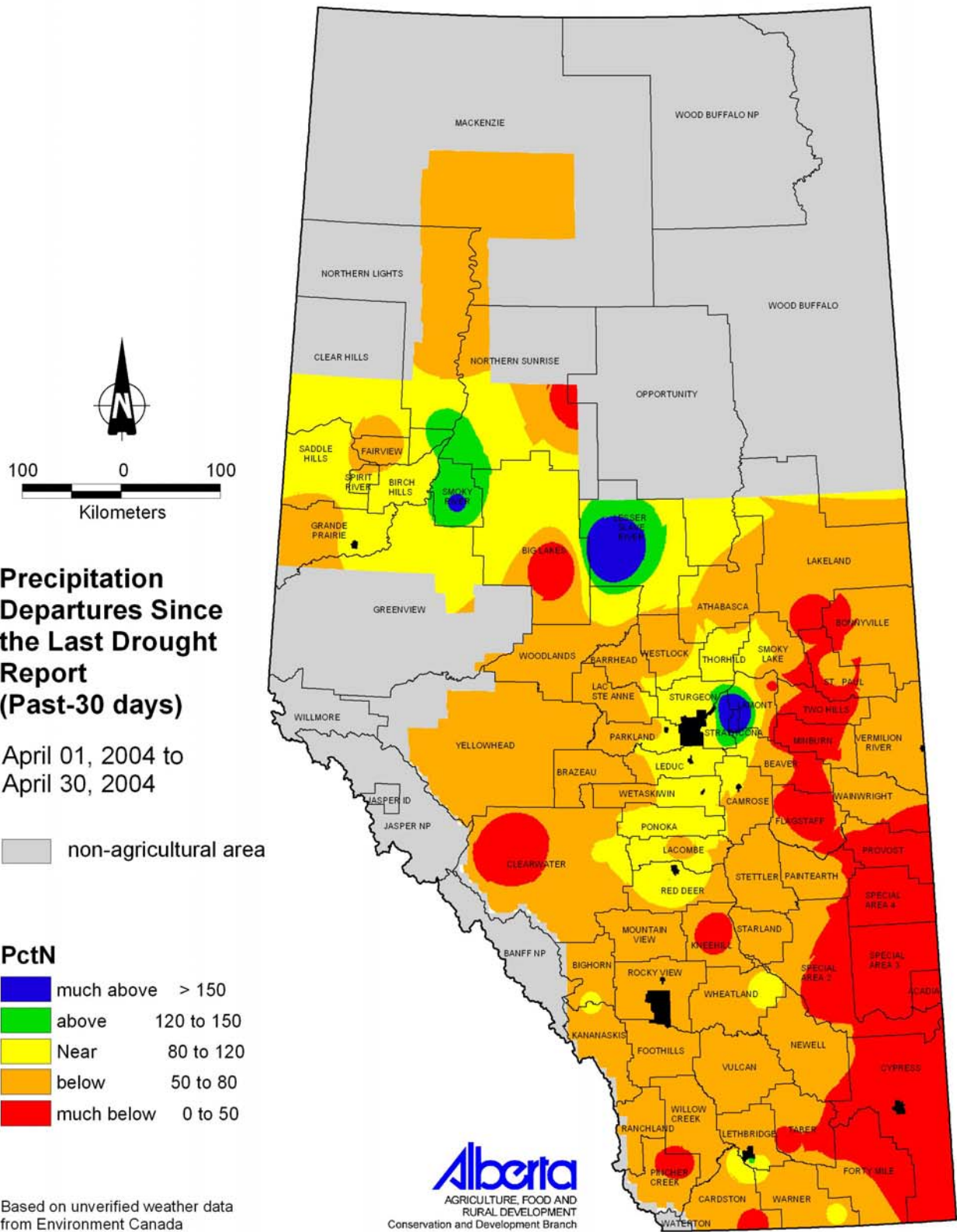


Figure 6. Precipitation departure for April 2004.

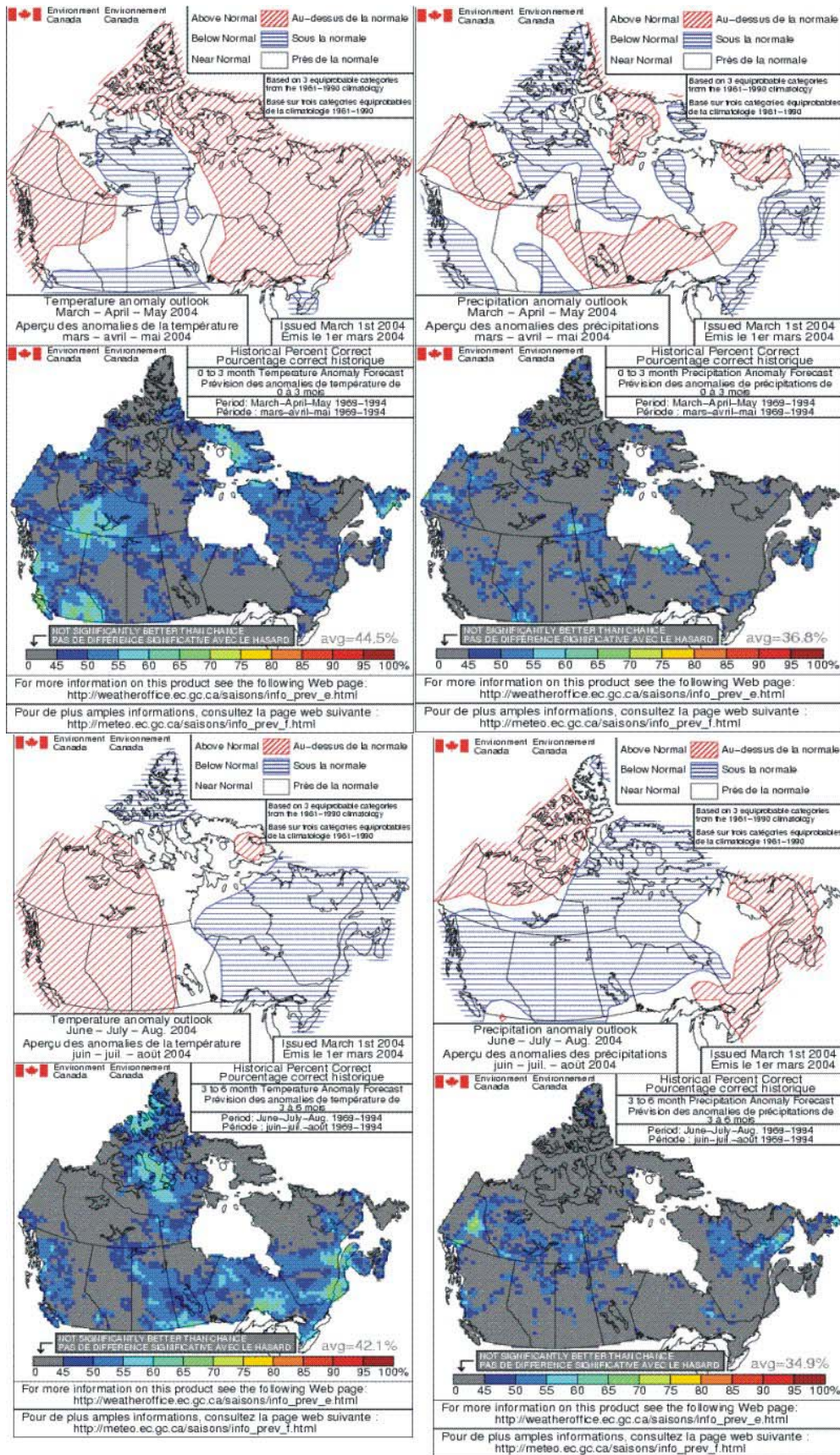


Figure 7. Environment Canada forecasts for March – May 2004 (top) and June – August bottom) for temperature (left) and precipitation (right).