

Water Supply Outlook for Alberta

January 2001



Alberta
ENVIRONMENT

Notes

Alberta Environment publishes the "**Water Supply Outlook for Alberta**" monthly, usually from February to August. These reports are prepared by the Water Sciences Branch, Hydrology/Forecasting Section of the Department's Water Management Division.

Alberta Environment is grateful for the assistance of Environment Canada's Climatological Services Unit and Water Resources Branch in providing weather, precipitation and streamflow data. Snow survey data are also provided by the United States, Soil Conservation Service of Montana and the British Columbia Ministry of Environment, Lands and Parks.

The assistance of a number of private citizens who diligently report observations of precipitation and other data is also appreciated.

Alberta Environment and the National Resources Conservation Service (NRCS) from Portland, Oregon are collaborating on the Water Supply Forecasts for the Milk and St. Mary Rivers. Water Supply forecasts for the Western United States are available through the NRCS web page:
http://www.wcc.nrcs.usda.gov/water/w_qnty.html

All data summarized in this publication are preliminary and subject to revision.

Data used in this report are available on request from: Alberta Environment, Water Sciences Branch, Hydrology/Forecasting Section, 10th Fl, Oxbridge Place, 9820 -106 Street, Edmonton, Alberta, T5K 2J6, **Fax: (780) 422-8606**

This report is also available through Alberta Environment's automated streamflow information/fax-on-demand service. To access this service toll-free, please call the Alberta Government RITE Operator at 310-0000, available 24 hours a day from anywhere in the province. At the prompt, enter the phone number **207-2718** for our streamflow information/fax on demand service.

Historical Streamflow Information: Environment Canada, Calgary, (403) 292-5317

Equivalents of Measure

Parameter	Metric Unit	Conversion to Imperial Units
Snow depth	centimetres	2.54 cm = 1 inch
Water Equivalent	millimetres	25.4 mm = 1 inch
Elevation	metres	1 m = 3.2808 feet
Streamflow	cubic metres per second	1 cms = 35.3 cfs
Volume	cubic decametre (dam ³)	1 dam ³ = 1000 m ³ = 0.8107 acre-feet

Explanation of Descriptions

Much-above-average	In the upper 15% of recorded values
Above-average	Between the upper 15% and 35% of recorded values
Below-average	Between the lower 15% and 35% of recorded values
Much-below-average	In the lower 15% of recorded values

Overview

Below-normal precipitation amounts were recorded across the province in December with the exception of the Lethbridge and Red Deer areas. As a result, mountain snowpack is much-below-normal for this time of the year. Four mountain snow courses were completed in the first week of January, all recording new historical minimum values. Plains snowpack is below-average for this time of the year. Temperatures in December were below-normal across the entire province.

Since the beginning of April, southern Alberta continues to be extremely dry as a result of a lack of precipitation. Current predictions from Environment Canada are for above-normal precipitation for southeastern areas of the province this winter (January to February), while National Oceanic and Atmospheric Administration is predicting normal precipitation across the province.

Water storage as of January 1, 2001 in the major irrigation and hydroelectric reservoirs in the Bow, Red Deer and North Saskatchewan River basins is normal for this time of the season. The exceptions are: Lake Abraham, which is above-normal and Spray Lake and Travers Reservoir, which are below-normal. In the Oldman River basin, reservoirs are below-normal except for Keho Lake, Lake McGregor, Lake Newell and Crawling Valley Reservoir, which are normal.

The Water Supply Outlook report will continue to be published monthly but will focus on the upcoming water year 2000-2001. Until February, the report will provide mid to long-term water supply forecasts and report on reservoir storage conditions, snow accumulation, and precipitation. The report is being published to continue monitoring the extremely dry conditions in southern Alberta.

December Climatic Conditions

Below-normal precipitation amounts were recorded across the province in December (Figures 1 and 2) except in the Lethbridge and Red Deer areas, where normal to above-normal precipitation occurred. Precipitation values ranged from 16 to 269 % of normal in the province during December. Precipitation in the foothills and mountain areas were below-normal in December, leading to much-below-average snowpack for this time of the year. During the first week of January, four mountain snow courses were completed and recorded new historical minimums for this time of the year. Temperatures in December were below-normal across the entire province.

Since the beginning of April, southern Alberta has received much-below-normal precipitation (Figures 3 and 4) and has created very dry conditions in southern Alberta.

Snowpack in the Plains areas of the province is below-average. A map of Plains snowpack is available from the Environment Canada website (http://www.msc-smc.ec.gc.ca/ccrp/SNOW/snow_swe.html).

Long-Lead Precipitation Outlook

Currently, there is no strong discernible signal in the El Niño/La Niña pattern. Environment Canada is forecasting above-normal precipitation for southeastern areas of the province this winter (December to February), while National Oceanic and Atmospheric Administration (NOAA) is predicting normal precipitation across the province. Environment Canada predicts above-normal precipitation for next spring (March to May) in eastern Alberta while NOAA predicts normal precipitation for the province. Preliminary forecasts by Environment Canada for the 2001 summer (June to August) are for above-normal precipitation in the southern two-thirds of Alberta, while NOAA is predicting normal precipitation across the province.

Milk River Basin

Conditions remained dry in the headwaters of the Milk River basin as much-below-normal precipitation was recorded in December (Figures 1 and 2). Precipitation remains much-below-normal since April 1 (Figures 3 and 4).

Much-below-average natural runoff volumes are forecast for the March to September 2001 period (Table 1). These forecasts assume that precipitation over the summer period will be normal. Precipitation over the next few months will have a major impact on the summer water supply forecasts between now and the end of September.

Table 1 Water Supply Forecast as of January 1, 2001 - Milk River Basin (Natural Flows)

Locations	Volume Forecast for March 1 to September 30					2000 Actual March to September Volume as a % of Median
	Volume in dam ³	Volume in acre- feet	Volume as a % of Median	Probable Range as a % of Median	Reasonable Minimum As % of Median	
Milk River at Western Crossing	23,100	18,700	41	22-95	17	31
Milk River at Milk River	38,300	31,100	40	21-93	17	27
Milk River at Eastern Crossing	47,700	38,700	41	20-95	17	N/A

Median is calculated for the March 1 to September 30 period from 1912 to 1995

Oldman River Basin

Precipitation was much-below-normal in the headwaters of the Oldman River basin during December (Figures 1 and 2). As a result, mountain snowpack is below-average for this time of the year and snow accumulation is currently near that observed in 1999. Snow pillow information is available on our website at www.gov.ab.ca/env/water/WSWaterReports/Index.html

The lack of precipitation since April 1 and low spring runoff last year has resulted in extremely dry conditions in the basin. Water storage in the major irrigation reservoirs of the Oldman River basin is below-normal for this time of the season, except for Keho Lake which is normal (Table 2).

Table 2 Status of Major Water Storage Reservoirs as of January 1, 2001 - Oldman River Basin

Reservoirs	Current Live Storage			Remarks	January 1, 2000 Live Storage	
	Volume in dam ³	Volume in acre- feet	Volume as % of Capacity		dam ³	Acre-feet
Keho Lake	81,200	65,900	72	Normal	78,400	63,600
Waterton Reservoir	73,500	59,600	43	below-normal	118,000	95,800
St. Mary Reservoir	35,300	28,600	9	below-normal	130,000	105,000
Ridge Reservoir	28,400	23,000	22	below-normal	107,000	86,700
Total	137,000	111,000	20	below-normal	354,000	287,000
Chin Reservoir	89,100	72,200	47	below-normal	180,000	146,000
Forty Mile Reservoir	42,800	34,700	50	below-normal	84,800	68,700
Total	132,000	107,000	48	below-normal	265,000	215,000
Oldman Reservoir	267,000	216,000	54	below-normal	420,000	340,000

Bow River Basin

Precipitation during December was much-below-normal in the Bow River basin (Figures 1 and 2). Snow pillows indicate much-below-average mountain snowpack conditions (www.gov.ab.ca/env/water/WSWaterReports/Index.html). Precipitation since April 1 has been below-normal in the basin, with an exception of Calgary, which has recorded normal values (Figures 3 and 4).

Water storage in most of the major hydroelectric and irrigation reservoirs is normal for the season with the exception of Spray Lake and Travers Reservoir, which are below-normal (Table 3).

Table 3 Status of Major Water Storage Reservoirs as of January 1, 2001 - Bow River Basin

Reservoirs	Current Live Storage			Remarks	January 1, 2000 Live Storage	
	Volume in dam ³	Volume in acre-feet	Volume as a % of Capacity		dam ³	Acre-feet
Lake Minnewanka	137,000	111,000	62	normal	157,000	127,000
Spray Lake	111,000	90,400	63	below-normal	120,000	97,400
Upper Kananaskis Lake	45,100	36,500	44	normal	54,800	44,400
Lower Kananaskis Lake	53,400	43,300	85	normal	52,000	42,200
Total	347,000	282,000	61	normal	384,000	311,000
Lake McGregor	309,000	250,000	85	normal	302,000	245,000
Travers Reservoir	54,200	44,000	52	below-normal	76,000	61,600
Total	363,000	294,000	77	normal	378,000	306,000
Lake Newell	159,000	129,000	89	normal	156,000	126,000
Crawling Valley Reservoir	102,000	82,400	90	normal	106,000	85,900
Total	260,000	211,000	90	normal	262,000	212,000

Red Deer River Basin

The Red Deer River basin recorded normal to above-normal precipitation in December (Figures 1 and 2). Snow pillows indicate below-average mountain snowpack conditions in the headwaters of the Red Deer Basin (www.gov.ab.ca/env/water/WSWaterReports/Index.html). Precipitation has been near-normal in the basin since April 1 (Figures 3 and 4).

Water storage in Glennifer Lake is normal for this time of the season (Table 4).

Table 4 Status of Major Water Storage Reservoirs as of January 1, 2001 – Red Deer River Basin

Reservoirs	Current Live Storage			Remarks	January 1, 2000 Live Storage	
	Volume in dam ³	Volume in acre-feet	Volume as a % of Capacity		dam ³	acre-feet
Glennifer Lake	150,000	122,000	74	normal	171,000	138,000

North Saskatchewan River Basin

Precipitation during December was much below-normal in the North Saskatchewan River basin (Figures 1 and 2). Precipitation since April 1 has been below-normal in the headwater portion of the basin.

Water storage in the North Saskatchewan major hydroelectric reservoirs is above-normal at Lake Abraham and normal at Brazeau Reservoir (Table 5).

Table 5 Status of Major Water Storage Reservoirs as of January 1, 2001 – North Saskatchewan River Basin

Reservoirs	Current Live Storage			Remarks	January 1, 2000 Live Storage	
	Volume in dam ³	Volume in acre-feet	Volume as a % of Capacity		dam ³	Acre-feet
Lake Abraham	937,000	760,000	66	above-normal	899,000	729,000
Brazeau Reservoir	312,000	253,000	64	normal	280,000	227,000
Total	1,249,000	1,012,000	66	above-normal	1,179,000	956,000

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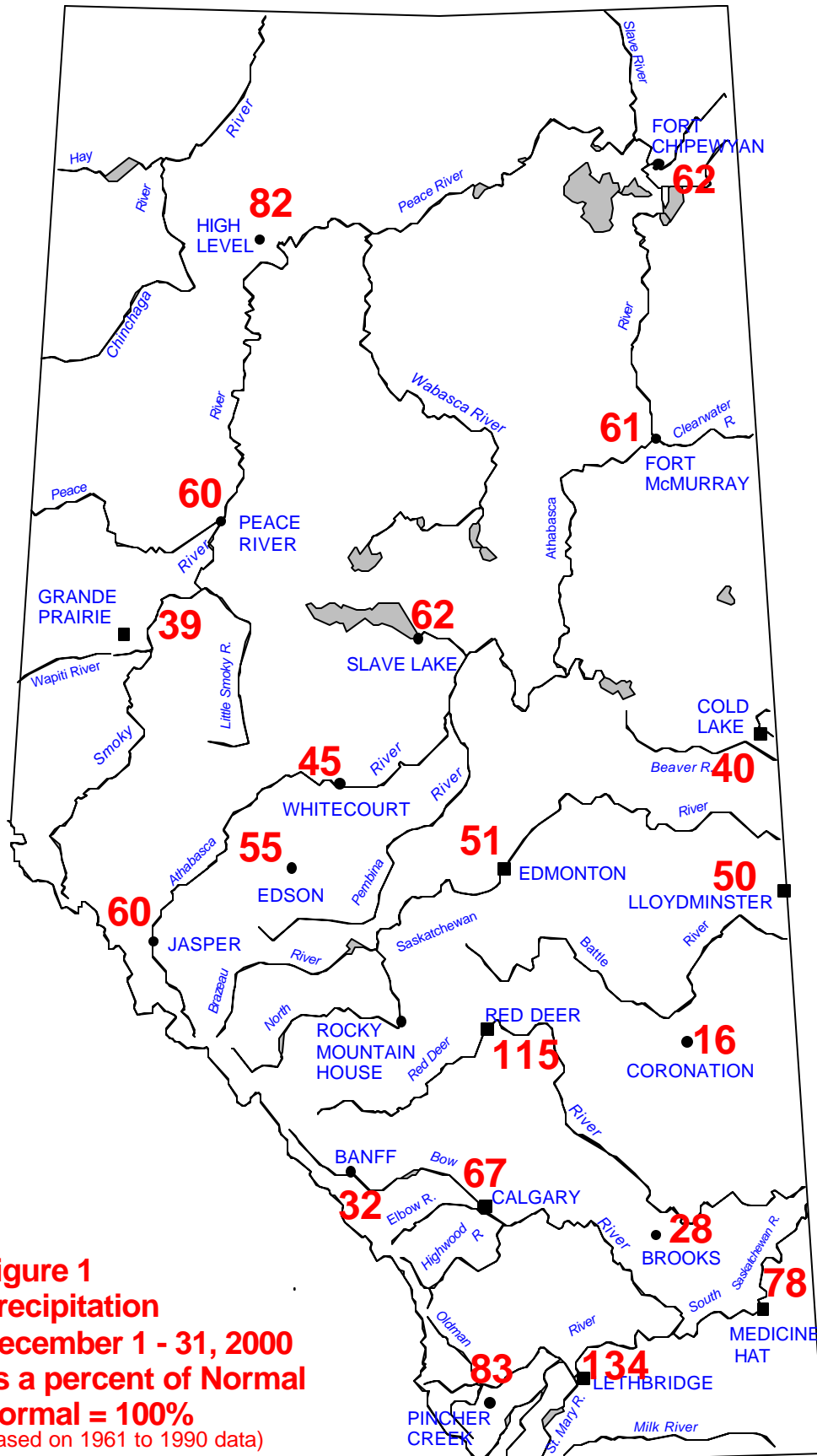


Figure 1
Precipitation
December 1 - 31, 2000
as a percent of Normal
Normal = 100%
 (based on 1961 to 1990 data)

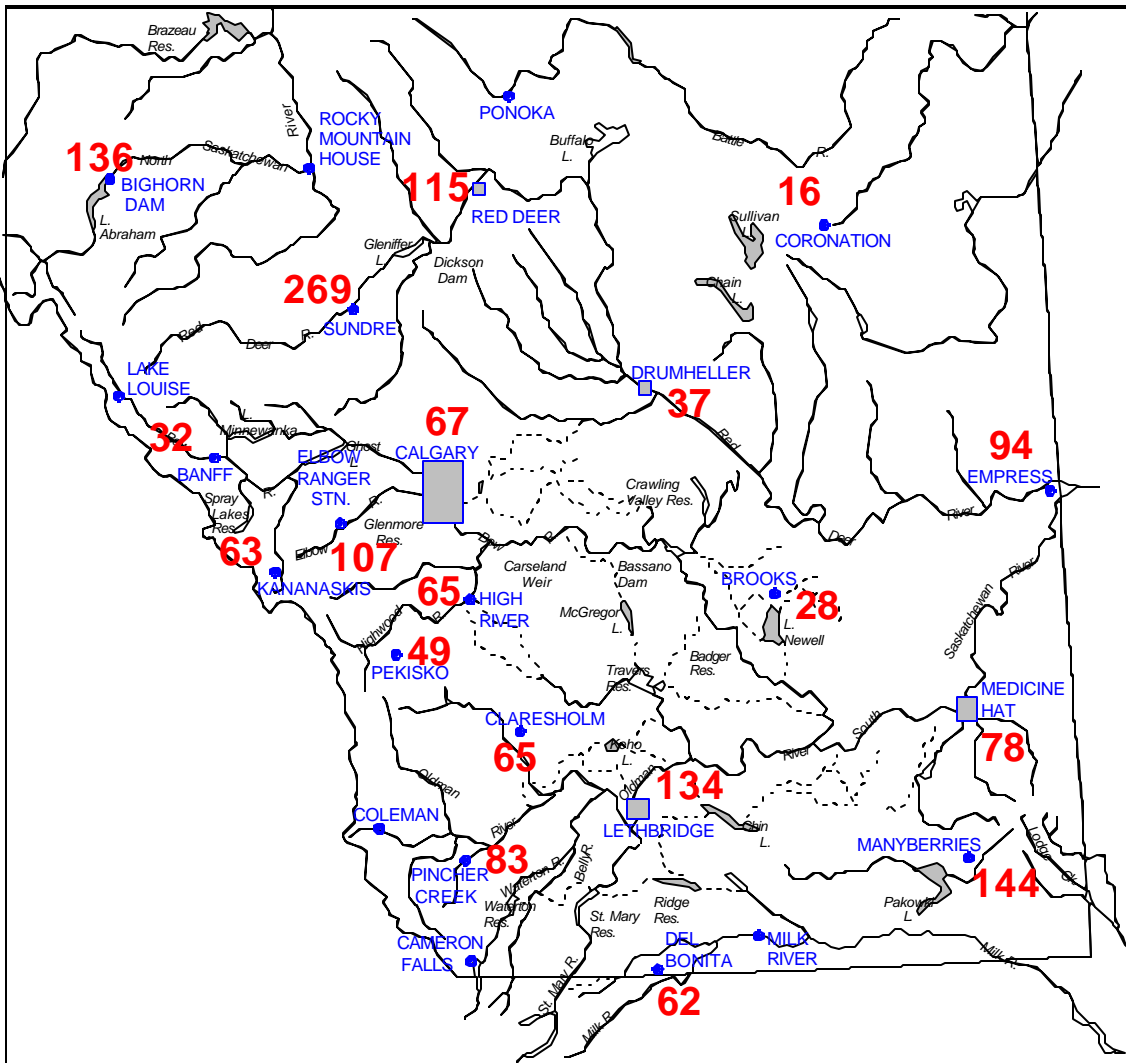


Figure 2
Southern Alberta
Precipitation
December 1 - 31, 2000
as a percent of Normal
Normal = 100%
 (based on 1961 to 1990 data)

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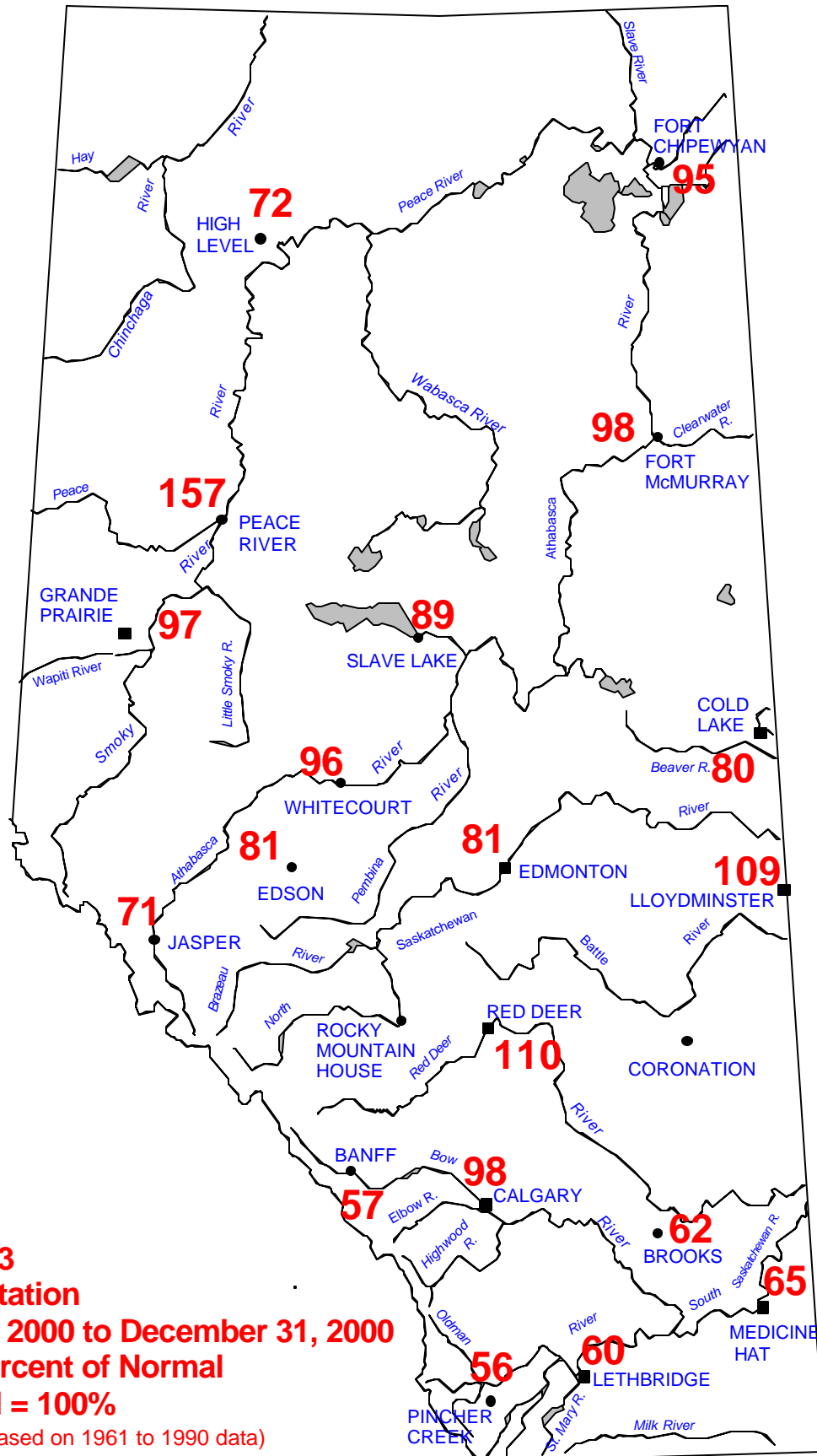


Figure 3
Precipitation
April 1, 2000 to December 31, 2000
as a percent of Normal
Normal = 100%
 (based on 1961 to 1990 data)

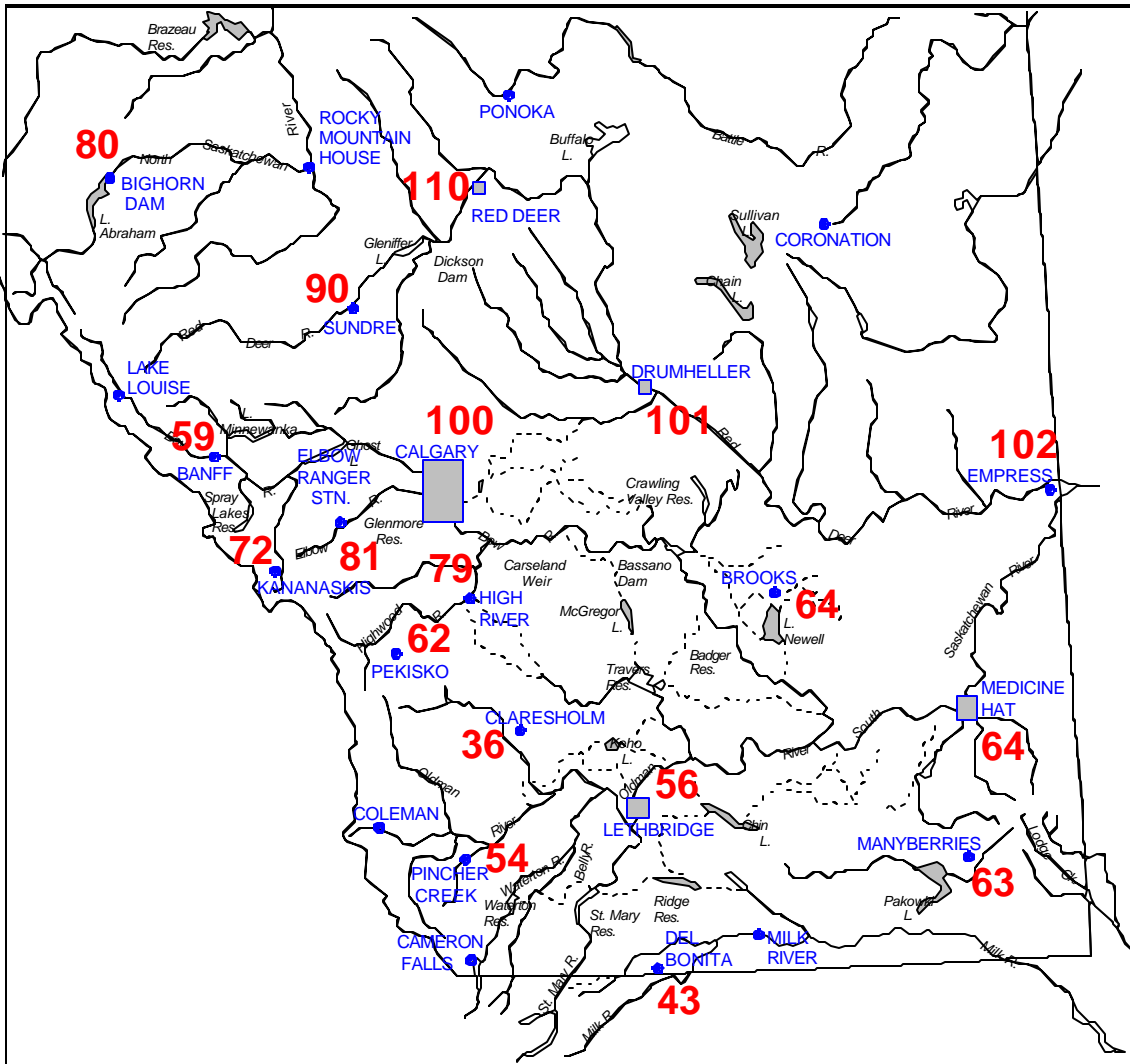


Figure 4
Southern Alberta
Precipitation
April 1, 2000 to December 31, 2000
as a percent of Normal
Normal = 100%
 (based on 1961 to 1990 data)