Mountain Snow Conditions and Water Supply Forecasts for Alberta

April 2001

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Notes

Alberta Environment publishes the **"Mountain Snow Conditions and Water Supply Forecasts 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

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Overview

Below to much-below-normal precipitation amounts were recorded in many areas of the province in March. Precipitation remains much-below-normal for the winter season (November 2000 to March 2001). Current predictions from Environment Canada are for above-normal precipitation for the March to May period in southern Alberta.

The April 1 Mountain snowpack was much-below-average in all areas along the eastern slopes. A majority of the measurements completed at the end of March set new historic minimum values. The only area along the mountains and foothills to have near normal accumulations is the Sundre area. Significant snowfall occurred in southern Alberta during the first few days of April. In most cases, this precipitation only brought current year snowfall accumulations close to or slightly above previous measured historical minimum values.

Fall precipitation (September to October 2000) was near normal in the south and below-normal in central regions and the foothills of western Alberta. The lack of precipitation since April 2000 in southern Alberta resulted in much-below-average soil moisture conditions heading into the winter season.

Water storage as of April 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 and Lower Kananaskis Lake, which are 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, which is normal.

April volume forecasts included precipitation that occurred during the first few days of April. Therefore, as of April 5, 2001, April to September natural streamflow volume is forecast to be much-below-average for the Milk, Oldman, Bow, Red Deer, and North Saskatchewan River headwaters.

March Climatic Conditions

Below-normal to much-below-normal precipitation amounts were recorded in many areas of the province in March (Figures 1 and 2). Precipitation values ranged from 7 to 137 % of normal during the month. Eastern and southern areas of the province recorded much-below-normal precipitation during the month. Temperatures were above-normal during the month of March. Precipitation remains much-below-normal for the winter season (November 2000 to March 2001) (Figures 3 and 4).

Long-Lead Precipitation Outlook

Environment Canada is forecasting above-normal precipitation in the March to May period for southern Alberta and below-normal precipitation in the Peace Country. The National Oceanic and Atmospheric Administration (NOAA) is forecasting normal precipitation for the April to May period. 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. La Niña conditions continued in February.

Summer Water Supply Volume Forecast

Fall Precipitation

Fall precipitation (September to October) was near normal in southern areas of the province (Figures 5 and 6). Central regions recorded below-normal fall precipitation and the foothills of western Alberta received below-normal to much-below-normal fall precipitation in 2000. The lack of precipitation since April 2000 in southern Alberta has resulted in soil moisture conditions being much-below-average heading into the winter season.

Mountain Snowpack

The April 1 Mountain snowpack remains much-below-average in all areas along the eastern slopes. Of the 33 mountain snow courses measured in Alberta during the last week of March, 21 recorded new historical minimums, with the majority of these sites located south of the Red Deer River. The Highwood, Elbow and Kananaskis headwaters continue to be well below the previous recorded minimum values. Most mountain and foothill areas received between 70% and 90% of normal precipitation for the month of March and remain much-below-average for this time of the year.

The only area along the mountains and foothills to have near normal accumulations is the Sundre-Rocky Mountain House area, where an isolated December snowfall accounted for most of the precipitation. The mountain snowpack conditions are shown in Figure 7 and are summarized in Table 1.

Snow pillow sites track snow accumulation in real-time. These plots are located on the department website at: (www.gov.ab.ca/env/water/WSWaterReports/Index.html).

Table 1 Mountain Snowpack Conditions as of April 1, 2001

Area	Snowpack Conditions (percent of Average)
Waterton/St. Mary River Headwaters	50 to 65%
Oldman River Headwaters	40 to 55%
Highwood/Kananaskis River headwaters	40 to 50%
Bow River Headwaters	45 to 55%
Red Deer River Headwaters	50 to 105%
North Saskatchewan River Headwaters	45 to 55%
Athabasca River Headwaters	45 to 60%
Smoky River Headwaters	55 to 65%

Average = 100%

April 2-4 Snowfall Event in Southern Alberta

Significant snowfall occurred across southern Alberta during the first few days of April. This snowfall would significantly change snow survey data acquired in the last week of March. Precipitation values ranged from 20 to 150 mm during the two-day event, with most of the snow falling in the mountains and foothills south of Calgary. A map showing precipitation totals for the April 2-4 storm event is located in Figure 8.

Water Supply Volume Forecasts

Conditions significantly changed as a result of the snowfall in the first part of April, therefore the April Water Supply Volume Forecasts has taken into account the precipitation that occurred from that event. Snow surveys are not scheduled again until the end of April.

As of April 5, 2001, much-below-average April to September natural streamflow volume is forecast for the Milk, Oldman, Bow, Red Deer, and North Saskatchewan River headwaters. These forecasts assume that precipitation over the summer period will be normal. The natural streamflow volume forecasts for 2001 and the actual 2000 volumes are presented in Table 2.

Precipitation will have a major impact on the summer water supply forecast between now and the end of September. Streamflow volume forecasts will be updated monthly until mid-summer. Check our Forecaster's

Comments web page throughout the month for updated information regarding runoff conditions.

Table 2 Water Supply Volume Forecasts as of April 5, 2001

Location	April to September 2001 Natural Streamflow Volume Forecasts as a percent of Average	May-September 2000 Actual Natural Streamflow Volumes as a percent of Average
Milk River at Milk River*	27*	26*
Oldman River at Lethbridge	54	51
Bow River at Calgary	76	77
Red Deer River at Red Deer	56	61
North Saskatchewan River at Edmonton	74	82

* The value for Milk River is compared to the median for the period April 1 to September 30

Milk River Basin

Conditions remained dry in the Milk River basin as precipitation was below-normal to much-below-normal during March (Figures 1 and 2). Precipitation remains much-below-normal during the winter season (November to March) (Figures 3 and 4). The headwater portion of the basin received near 30 mm of precipitation during the first few days of April (Figure 8).

Much-below-average natural runoff volumes are forecast for the April to September 2001 period (Table 3). Forecasted values increased slightly from those last month due to the snowfall in early April. Current forecasted values for the April to September period for the Milk River at Milk River would rank eighth lowest in 84-years of record (1912-95).

Table 3 Water Supply Forecast as of April 5, 2001 - Milk River Basin (Natural Flows)

Locations	Volume Forecast for April 1 to September 30					Forecast Ranking (lowest to highest)
	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	13,900	11,300	28	14-78	10	9
Milk River at Milk River	22,600	18,300	27	14-73	10	8
Milk River at Eastern Crossing	23,300	18,900	25	10-77	9	5

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

NOTE: There is: a 50% chance that the actual natural flow will fall within the probable range given; a 25% chance that the actual flow will be less than the lower bound of the probable range given; and a 10% chance that the actual natural flow will be less than the reasonable minimum. Actual day to day streamflow conditions may vary throughout the season as a result of the effects of streamflow diversion and reservoir storage.

Oldman River Basin

Precipitation was below-normal in the Oldman River basin during March (Figures 1 and 2). Most sites received 60% to 80% of normal precipitation during March. Eight snow course measurements were made in the basin during the last week of March, of which, five sites recorded new historical minimums (Table 4). Precipitation totals during the snowfall in early April brought between 40 and 100 mm to the mountain and foothill areas (Figure 8). In most cases, snowfall from this event brought the current year snowfall total back to or just above the previous historical minimum value.

Table 4 April 2001 Snow course measurements in the Oldman River Basin

Station Name	Apr 1/01 SWE(mm)	% of Avg.	Max SWE(mm)	Min SWE(mm)	Avg. SWE(mm)	Years of Data	Apr 1/01 Ranking (lowest to highest)
Akamina	270	50	823	307	543	21	1
Allison Pass	247	51	823	302	488	37	1
Gardiner HW	387	51	1262	498	766	14	1
Lee Creek	73	63	315	0	115	29	10
South Racehorse	236	55	589	315	429	7	1
West Castle	201	49	846	155	408	34	2
Wilkinson Bush	100	46	460	112	218	37	1
Wilkinson Open	71	41	417	66	172	36	2

Much-below-average natural runoff volumes are forecast for the April to September 2001 period. These forecasts include the precipitation that occurred from April 2-4 in the basin. These forecasts assume normal precipitation over the spring and summer period. Natural flow volumes are higher for the April to September period compared to the April to June period because of the assumption of normal precipitation from July to September. Forecasted values have increased from last month, especially in the Waterton and Belly River systems, however increases were in the four to six percent range. Current forecasted values for the Oldman River near Lethbridge during the April to September period would rank eighth lowest in the recorded values over an 84-year period (1912-95). Natural volume forecasts for the April to June period are provided in Table 5 and the April to September volumes are located in Table 6.

Table 5 Water Supply Forecast as of April 5, 2001 - Oldman River Basin (Natural Flows)

Locations	Volume Forecast for April 1 to June 30					
	Volume in dam^3	Volume in acre-feet	Volume as a % of Average	Probable Range as a % of Average	Reasonable Minimum as a % of Average	Forecast Ranking (lowest to highest)
St. Mary River	262,000	212,000	55	41-71	37	5
Belly River	120,000	97,600	79	61-94	47	14
Waterton River	309,000	250,000	68	54-83	37	12
Oldman River near Brocket	328,000	266,000	42	36-60	33	7
Oldman River near Lethbridge	1,055,000	855,000	52	40-68	33	8

Average is calculated for the period 1912 to 1995

NOTE: There is: a 50% chance that the actual natural flow will fall within the probable range given; a 25% chance that the actual flow will be less than the lower bound of the probable range given; and a 10% chance that the actual natural flow will be less than the reasonable minimum. Actual day to day streamflow conditions may vary throughout the season as a result of the effects of streamflow diversion and reservoir storage.

Table 6 Water Supply Forecast as of April 1, 2001 - Oldman River Basin (Natural Flows)

Locations	Volume Forecast for April 1 to September 30					Forecast Ranking (lowest to highest)
	Volume in Dam^3	Volume in Acre-feet	Volume as a % of Average	Probable Range as a % of Average	Reasonable Minimum as a % of Average	
St. Mary River	422,000	342,000	58	44-79	34	6
Belly River	181,000	147,000	76	60-95	46	14
Waterton River	412,000	334,000	64	52-87	36	12
Oldman River near Brocket	487,000	394,000	46	38-68	32	5
Oldman River near Lethbridge	1,555,000	1,260,000	54	43-76	33	8

Average is calculated for the period 1912 to 1995

NOTE: There is: a 50% chance that the actual natural flow will fall within the probable range given; a 25% chance that the actual flow will be less than the lower bound of the probable range given; and a 10% chance that the actual natural flow will be less than the reasonable minimum. Actual day to day streamflow conditions may vary throughout the season as a result of the effects of streamflow diversion and reservoir storage.

The lack of precipitation since last spring has resulted in very 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 7).

Table 7 Status of Major Water Storage Reservoirs as of April 1, 2001 - Oldman River Basin

Reservoirs	Current Live Storage			Remarks	April 1, 2000 Live Storage	
	Volume in dam^3	Volume in acre-feet	Volume as % of Capacity		dam^3	Acre-feet
Keho Lake	80,200	65,000	71	normal	79,400	64,400
Waterton Reservoir	71,700	58,100	42	below-normal	59,900	48,600
St. Mary Reservoir	31,600	25,600	8	below-normal	116,000	93,700
Ridge Reservoir	28,300	23,000	22	below-normal	106,000	86,300
Total	132,000	107,000	19	below-normal	282,000	229,000
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	247,000	200,000	50	below-normal	398,000	323,000

Bow River Basin

Precipitation during March was below-normal to normal in the Bow River basin (Figures 1 and 2). Precipitation values in the basin ranged from 70% to 110% of normal during March. Precipitation since November 1 has been much-below-normal in the basin (Figures 3 and 4). Fifteen of the eighteen snow course measurements were completed at the end of March in the Bow River basin (Table 8) of which, twelve sites set new historical minimum values. Snow course measurements in the Highwood River basin remain low. Significant precipitation fell in the first few days of April, particularly in the Elbow, Kananaskis and Highwood River basins. Precipitation values were near 100 mm in these areas, which brought current year snowfall accumulations close to the previous historical minimum value.

Table 8 April Snow course measurements in the Bow River Basin

Station Name	Apr 1/01 SWE(mm)	% of Avg.	Max SWE(mm)	Min SWE(mm)	Avg. SWE(mm)	Years of Data	Apr 1/01 Ranking (lowest to highest)
Bow River	104	49	437	97	212	64	3
Bow Summit	180	47	584	206	385	22	1
Chateau Lawn	131	47	480	135	276	59	1
Cuthead Lake	N/A		749	239	435	22	
Highwood Summit	180	45	681	244	400	30	1
Katherine Lake	N/A		663	246	443	18	
Larch Valley	N/A		632	277	457	21	
Little Elbow	145	43	597	216	339	21	1
Lost Creek	212	38	825	328	554	16	1
Mt. Odlum	221	47	699	282	475	15	1
Mirror Lake	161	53	561	160	303	61	2
Mist Creek	112	50	373	140	222	22	1
Mud Lake	147	43	526	183	340	23	1
Pipestone Upper	119	54	434	109	220	64	5
Ptarmigan Hut	224	55	681	231	405	34	1
Sunshine Village	277	45	996	340	612	34	1
Tent Ridge	155	42	605	224	368	20	1
Three Isle Lake	305	50	874	368	611	19	1

Much-below-average natural runoff volumes are forecast for the April to September 2001 period. Forecasted values include the precipitation that occurred April 2-4. These forecasts assume normal precipitation over the spring and summer period. Natural flow volumes are higher for the April to September period compared to the April to June period because of the assumption of normal precipitation from July to September. Forecasted values increased from last month, particularly in the Kananaskis and Spray Rivers. Forecasts for the Elbow and Highwood Rivers were relatively unchanged despite the snowfall early in April. Current forecasted values for the Bow River at Calgary during the April to September period would rank thirteenth lowest on record (1912-95 period). Natural volume forecasts for the April to June (Table 9) and the April to September (Table 10) periods are provided below.

Table 9 Water Supply Forecast as of April 5, 2001 - Bow River Basin (Natural Flows)

Locations	Volume Forecast for April 1 to June 30					
	Volume in dam^3	Volume in acre-feet	Volume as a % of Average	Probable Range as a % of Average	Reasonable Minimum as a % of Average	Forecast Ranking (lowest to highest)
Bow River at Banff	350,000	284,000	75	69-84	58	5
Lake Minnewanka Inflow	59,500	48,200	69	50-79	45	5
Spray Lake near Banff	119,000	96,500	69	59-76	54	4
Kananaskis River	133,000	107,000	71	64-79	53	8
Bow River at Calgary	750,000	608,000	66	59-75	50	6
Elbow River	46,800	37,900	45	36-68	32	2
Highwood River	152,000	124,000	38	32-66	29	3

Average is calculated for the period 1912 to 1995

NOTE: There is: a 50% chance that the actual natural flow will fall within the probable range given; a 25% chance that the actual flow will be less than the lower bound of the probable range given; and a 10% chance that the actual natural flow will be less than the reasonable minimum. Actual day to day streamflow conditions may vary throughout the season as a result of the effects of streamflow diversion and reservoir storage.

Table 10 Water Supply Forecast as of April 5, 2001 - Bow River Basin (Natural Flows)

Locations	Volume Forecast for April 1 to September 30					Forecast Ranking (lowest to highest)
	Volume in dam^3	Volume in acre-feet	Volume as a % of Average	Probable Range as a % of Average	Reasonable Minimum as a % of Average	
Bow River at Banff	887,000	719,000	84	71-91	58	12
Lake Minnewanka Inflow	134,000	108,000	74	55-87	46	13
Spray Lake near Banff	270,000	219,000	75	62-86	56	7
Kananaskis River	307,000	249,000	76	66-88	55	10
Bow River at Calgary	1,809,000	1,467,000	76	64-85	54	13
Elbow River	108,000	87,400	51	42-79	29	5
Highwood River	264,000	214,000	43	34-76	24	8

Average is calculated for the period 1912 to 1995

NOTE: There is: a 50% chance that the actual natural flow will fall within the probable range given; a 25% chance that the actual flow will be less than the lower bound of the probable range given; and a 10% chance that the actual natural flow will be less than the reasonable minimum. Actual day to day streamflow conditions may vary throughout the season as a result of the effects of streamflow diversion and reservoir storage.

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 and Lower Kananaskis Lake, which is above-normal (Table 11).

Table 11 Status of Major Water Storage Reservoirs as of April 1, 2001 - Bow River Basin

Reservoirs	Current Live Storage			Remarks	April 1, 2000 Live Storage	
	Volume in dam^3	Volume in acre-feet	Volume as a % of Capacity		dam^3	Acre-feet
Lake Minnewanka	89,300	72,400	40	normal	88,500	71,700
Spray Lake	25,500	20,600	14	below-normal	22,800	18,500
Upper Kananaskis Lake	7,590	6,150	7	normal	8,900	7,200
Lower Kananaskis Lake	24,300	20,000	38	above-normal	20,100	16,300
Total	147,000	119,000	26	normal	140,000	114,000
Lake McGregor	309,000	250,000	85	normal	229,000	186,000
Travers Reservoir	61,500	49,900	59	below-normal	77,600	62,900
Total	371,000	300,000	79	normal	307,000	249,000
Lake Newell	159,000	129,000	89	normal	157,000	127,000
Crawling Valley Reservoir	102,000	82,400	90	normal	101,000	81,900
Total	260,000	211,000	90	normal	258,000	209,000

Red Deer River Basin

The Red Deer River basin recorded below-normal to normal precipitation in March (Figures 1 and 2). Precipitation values ranged from 65% to 110% of normal in most areas of the headwater portion of the basin during March. Precipitation totals remain much-below-normal for the winter period (November to March) with the exception of the Sundre area, which has recorded normal precipitation (Figures 3 and 4). This area of higher precipitation is evident in the data from the snow courses in the basin. Limestone snow course (Table 12) indicated normal accumulation while the other three snow courses recorded new historical minimums. The Red Deer River basin received between 10 and 50 mm in the April 2-4 snowfall event.

Table 12 April 2001 Snow course measurements in the Red Deer, North Saskatchewan and Athabasca River Basins

Station Name	Apr 1/01 SWE(mm)	% of Avg.	Max SWE(mm)	Min SWE(mm)	Avg. SWE(mm)	Years of Data	Apr 1/01 Ranking (lowest to highest)
Red Deer							
Gable Mountain	104	54	330	130	191	19	1
Limestone	165	115	221	58	144	18	14
McConnell Creek	89	49	338	109	183	20	1
Skoki Lodge	203	55	472	182	305	17	1
North Saskatchewan							
Brown Creek	74	114	147	10	65	24	14
Nigel Creek	208	48	700	198	436	32	2
Nordegg	76	112	119	0	68	27	18
Athabasca							
Hinton	38	45	157	0	85	26	5
Marmot-Jasper	102	42	422	147	242	31	1
Sunwapta Falls	119	60	333	89	199	32	3

Much-below-average natural runoff volumes are forecast for the April to September 2001 period. Forecasted values include the precipitation that occurred April 2-4. These forecasts assume normal precipitation over the spring and summer period. Natural flow volumes are higher for the April to September period compared to the April to June period because of the assumption of normal precipitation from July to September. Forecasted values were relatively unchanged from those produced last month. Current forecasted values for the April to September period in the Red Deer River basin would rank twelfth lowest in the recorded values over an 84-year period (1912-95). Natural volume forecasts for the April to June (Table 13) and the April to September (Table 14) periods are located below.

Table 13 Water Supply Forecast as of April 5, 2001 – Red Deer River Basin (Natural Flows)

Locations	Volume Forecast for April 1 to June 30					
	Volume in dam^3	Volume in acre-feet	Volume as a % of Average	Probable Range as a % of Average	Reasonable Minimum as a % of Average	Forecast Ranking (lowest to highest)
Glennifer Lake	286,000	232,000	68	49-78	38	11
Red Deer River at Red Deer	366,000	297,000	56	39-64	31	11

Average is calculated for the period 1912 to 1995

NOTE: There is: a 50% chance that the actual natural flow will fall within the probable range given; a 25% chance that the actual flow will be less than the lower bound of the probable range given; and a 10% chance that the actual natural flow will be less than the reasonable minimum. Actual day to day streamflow conditions may vary throughout the season as a result of the effects of streamflow diversion and reservoir storage.

Table 14 Water Supply Forecast as of April 5, 2001 - Red Deer River Basin (Natural Flows)

Locations	Volume Forecast for April 1 to September 30					Forecast Ranking (lowest to highest)
	Volume in dam^3	Volume in acre-feet	Volume as a % of Average	Probable Range as a % of Average	Reasonable Minimum as % of Average	
Glennifer Lake	595,000	482,000	65	50-86	38	12
Red Deer River at Red Deer	711,000	576,000	56	41-78	32	12

Average is calculated for the period 1912 to 1995

NOTE: There is: a 50% chance that the actual natural flow will fall within the probable range given; a 25% chance that the actual flow will be less than the lower bound of the probable range given; and a 10% chance that the actual natural flow will be less than the reasonable minimum. Actual day to day streamflow conditions may vary throughout the season as a result of the effects of streamflow diversion and reservoir storage.

Water storage in Glennifer Lake is normal for this time of the season (Table 15).

Table 15 Status of Major Water Storage Reservoirs as of April 1, 2001 – Red Deer River Basin

Reservoirs	Current Live Storage			Remarks	April 1, 2000 Live Storage	
	Volume in dam^3	Volume in acre-feet	Volume as a % of Capacity		dam^3	acre-feet
Glennifer Lake	80,000	64,800	39	normal	99,400	80,600

North Saskatchewan River Basin

Precipitation during March was normal to above-normal in the North Saskatchewan River basin (Figures 1 and 2). Winter precipitation (November to March) remains below-normal (Figures 3 and 4). Two of the three snow course measurements in the basin at the end of March (Brown Creek and Nordegg) were average (Table 12). These sites correspond to the pocket of snow observed in the foothills of the Sundre-Rocky Mountain area. Nigel Creek, a higher elevation site, recorded the second lowest snowpack value in 29 years (Table 12). Other higher elevation snow course sites in the adjacent Athabasca River basin are also near the historical minimum values. Therefore, the snowpack at the higher elevations of the North Saskatchewan River basin are assumed to be much-below-average. The snowfall event in early April did not affect the North Saskatchewan basin, as the majority of the precipitation fell south of the basin.

Much-below-average natural runoff volumes are forecast for the April to September 2001 period (Table 16). No additional precipitation from the early April snowstorm was added to the forecast. Forecasted values did not change significantly from those produced last month. Current forecasted values for the April to September period in the North Saskatchewan River at Edmonton would rank twelfth lowest in 84-years (1912-95).

Table 16 Water Supply Forecast as of April 1, 2001 - North Saskatchewan River Basin (Natural Flows)

Locations	Volume Forecast for April 1 to September 30					Forecast Ranking (lowest of highest)
	Volume in dam^3	Volume in acre-feet	Volume as a % of Average	Probable Range as a % of Average	Reasonable Minimum as a % of Average	
Lake Abraham Inflow	1,790,000	1,451,000	85	78-91	73	2*
Brazeau Reservoir Inflow	978,000	793,000	69	56-87	52	5**
North Saskatchewan River at Edmonton	4,293,000	3,480,000	74	67-86	58	12

Average is calculated for the period from 1912 to 1995

* Lake Abraham ranking based on 20 years of record
** Brazeau Reservoir ranking based on 29 years of record

NOTE: There is: a 50% chance that the actual natural flow will fall within the probable range given; a 25% chance that the actual flow will be less than the lower bound of the probable range given; and a 10% chance that the actual natural flow will be less than the reasonable minimum. Actual day to day streamflow conditions may vary throughout the season as a result of the effects of streamflow diversion and reservoir storage.

Water storage in the North Saskatchewan major hydroelectric reservoirs is above-normal at Lake Abraham and normal at Brazeau Reservoir (Table 17).

Table 17 Status of Major Water Storage Reservoirs as of April 1, 2001 – North Saskatchewan River Basin

Reservoirs	Current Live Storage			Remarks	April 1, 2000 Live Storage	
	Volume in dam^3	Volume in acre-feet	Volume as a % of Capacity		dam^3	Acre-feet
Lake Abraham	453,000	368,000	32	above-normal	423,000	343,000
Brazeau Reservoir	53,800	43,600	11	normal	26,400	21,400
Total	507,000	411,000	27	normal	450,000	365,000

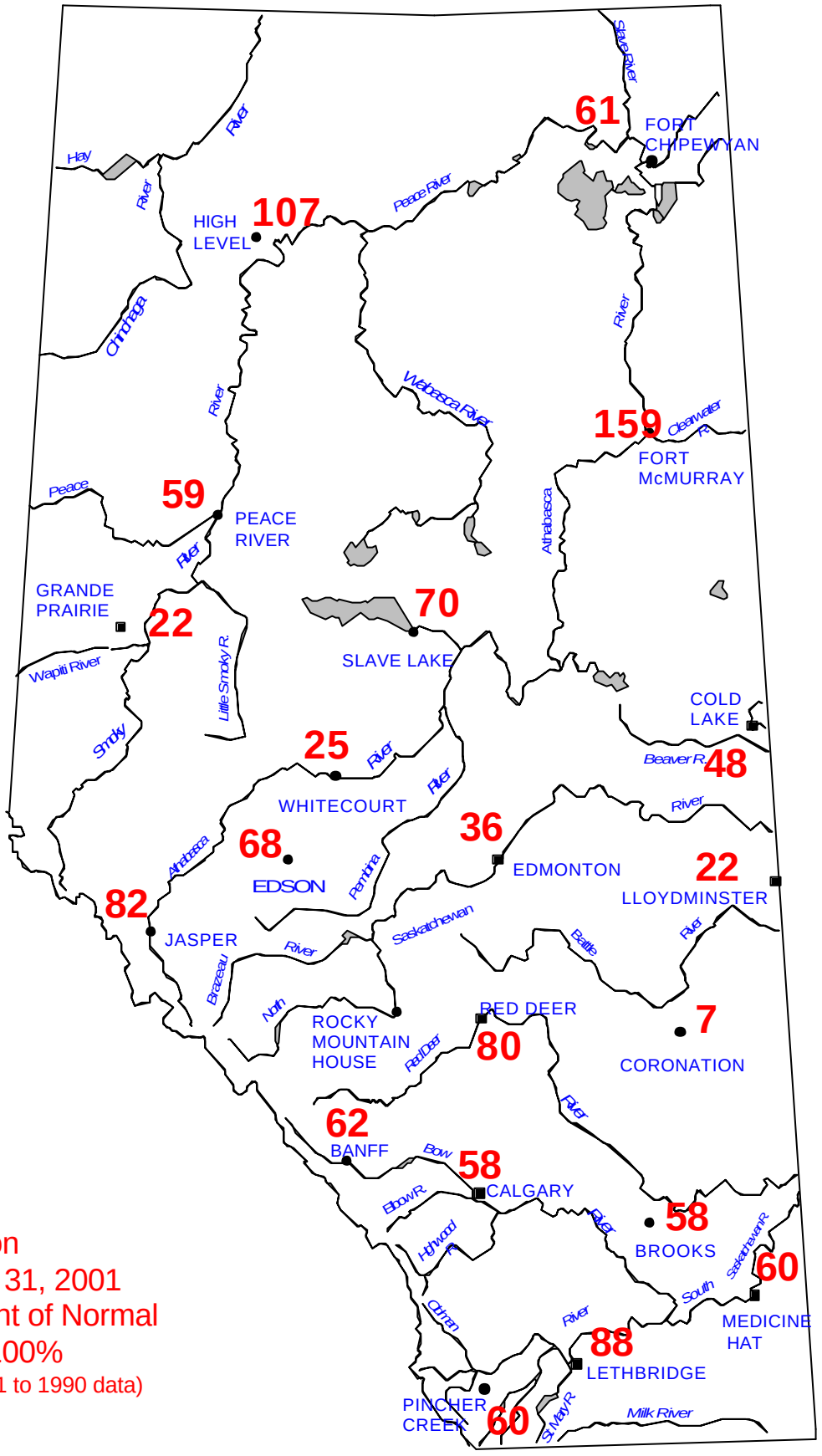

Figure 1
Precipitation
March 1 to 31, 2001
as a percent of Normal
Normal = 100%
(based on 1961 to 1990 data)

Alberta ENVIRONMENT

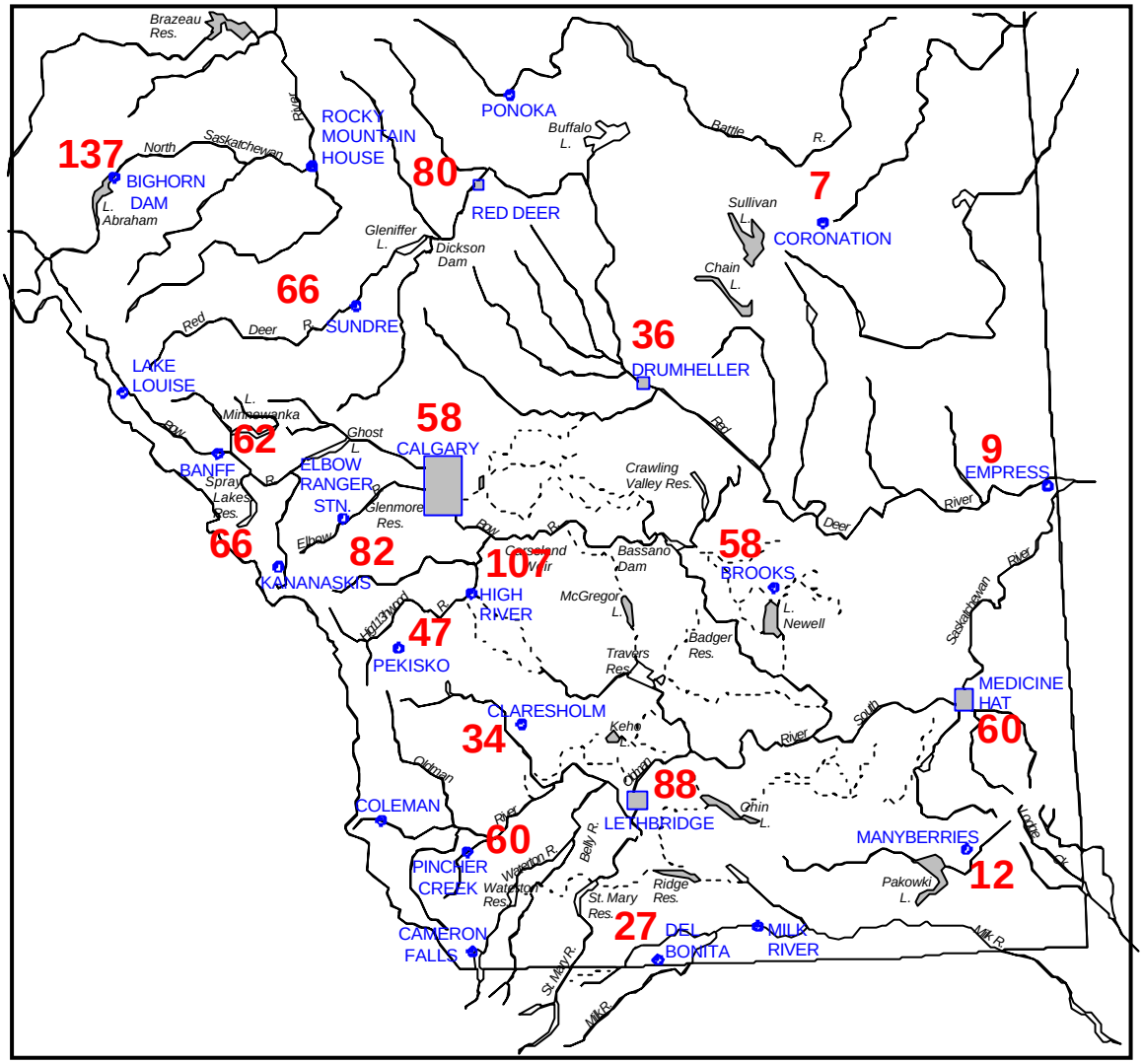

Figure 2
Winter Precipitation
Southern Alberta
March 1 to 31, 2001
as a percent of Normal
Normal = 100%
(based on 1961 to 1990 data)

Alberta ENVIRONMENT

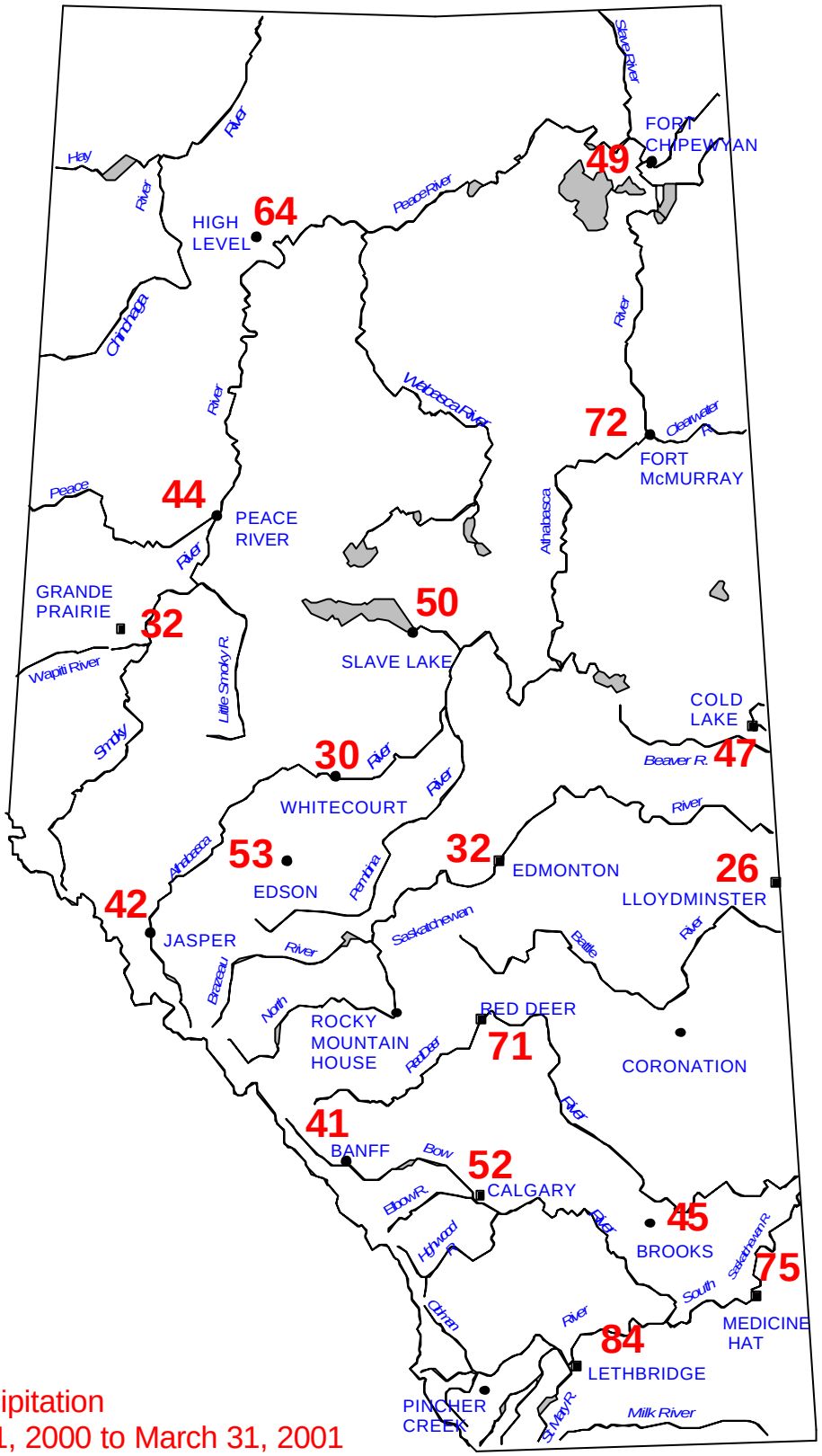

Figure 3
Winter Precipitation
November 1, 2000 to March 31, 2001
as a percent of Normal
Normal = 100%
(based on 1961 to 1990 data)

Alberta ENVIRONMENT

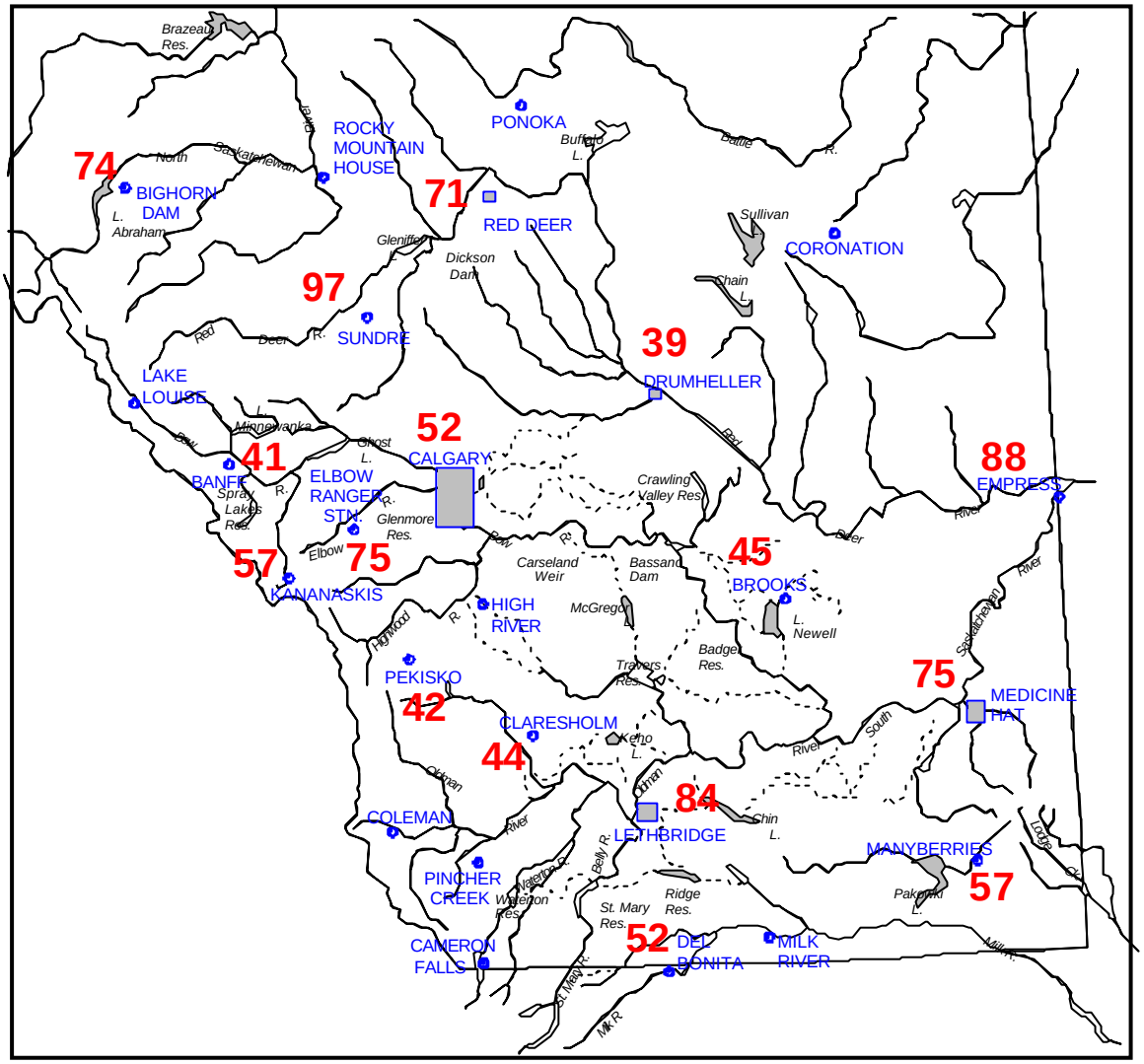

Figure 4
Winter Precipitation
Southern Alberta
November 1, 2000 to March 31, 2001
as a percent of Normal
Normal = 100%
(based on 1961 to 1990 data)

Alberta ENVIRONMENT

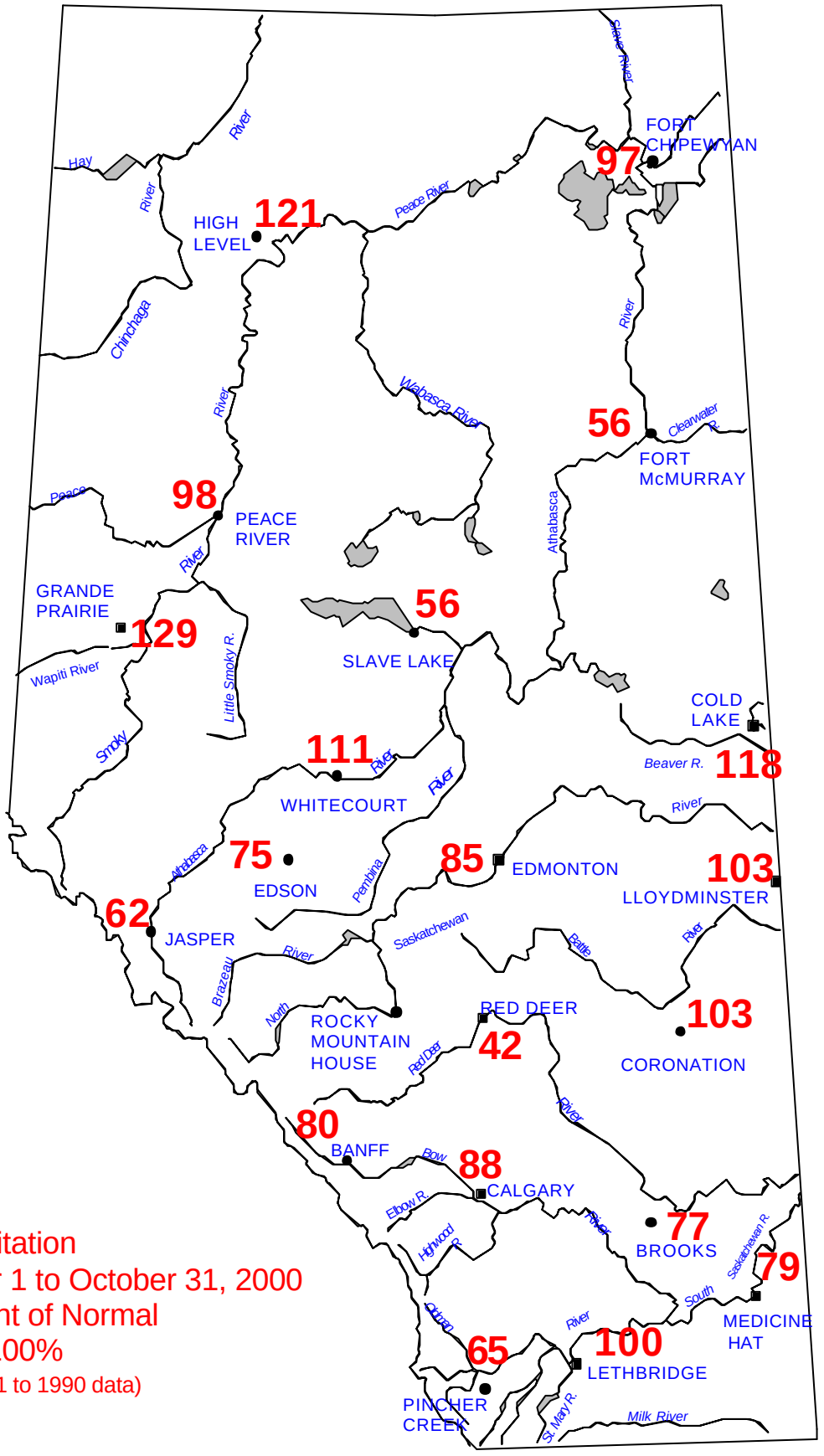

Figure 5
Fall Precipitation
September 1 to October 31, 2000
as a percent of Normal
Normal = 100%
(based on 1961 to 1990 data)

Alberta ENVIRONMENT

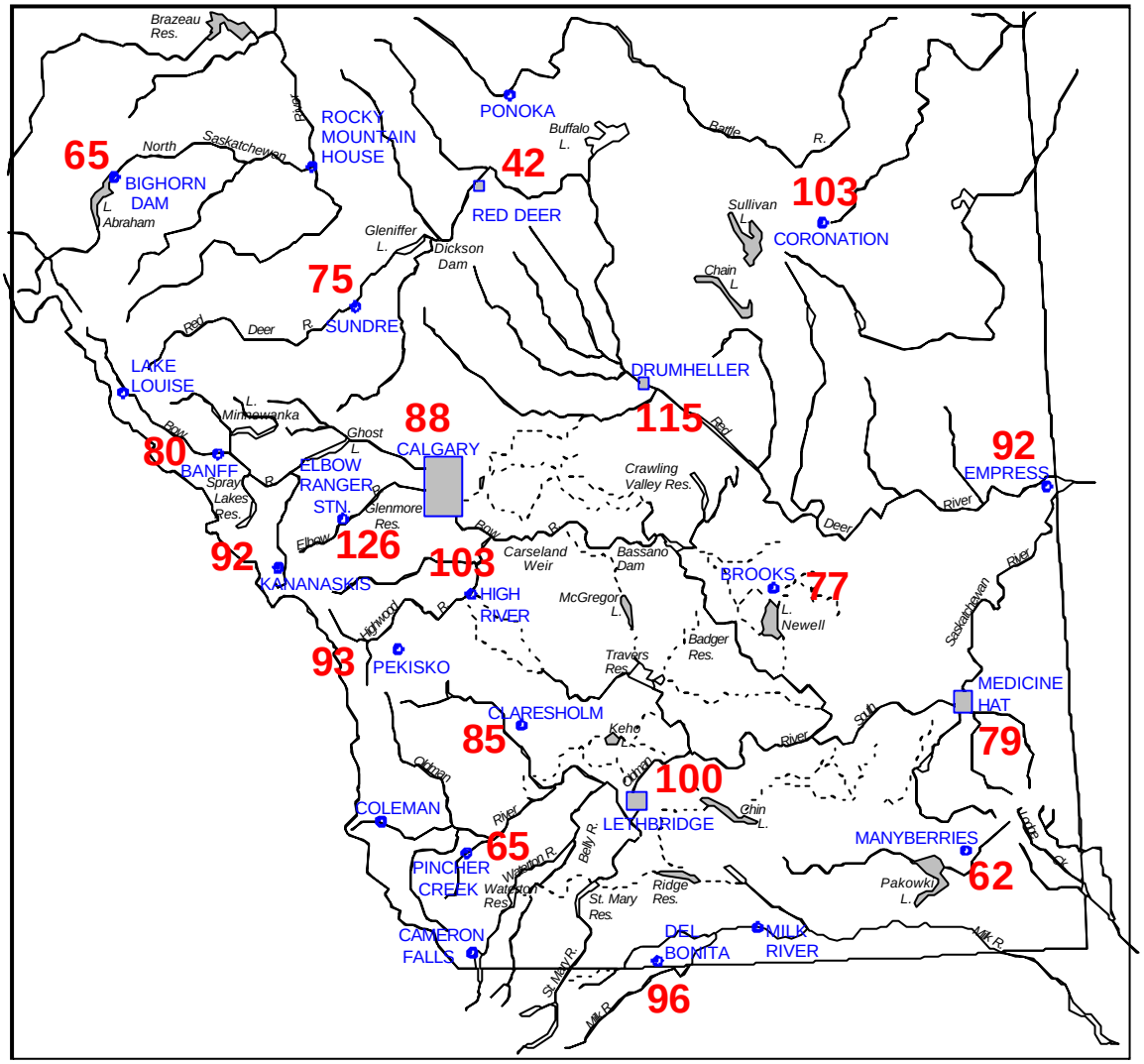

Figure 6
Fall Precipitation
Southern Alberta
September 1 to October 31, 2000
as a percent of Normal
Normal = 100%
(based on 1961 to 1990 data)

Alberta ENVIRONMENT

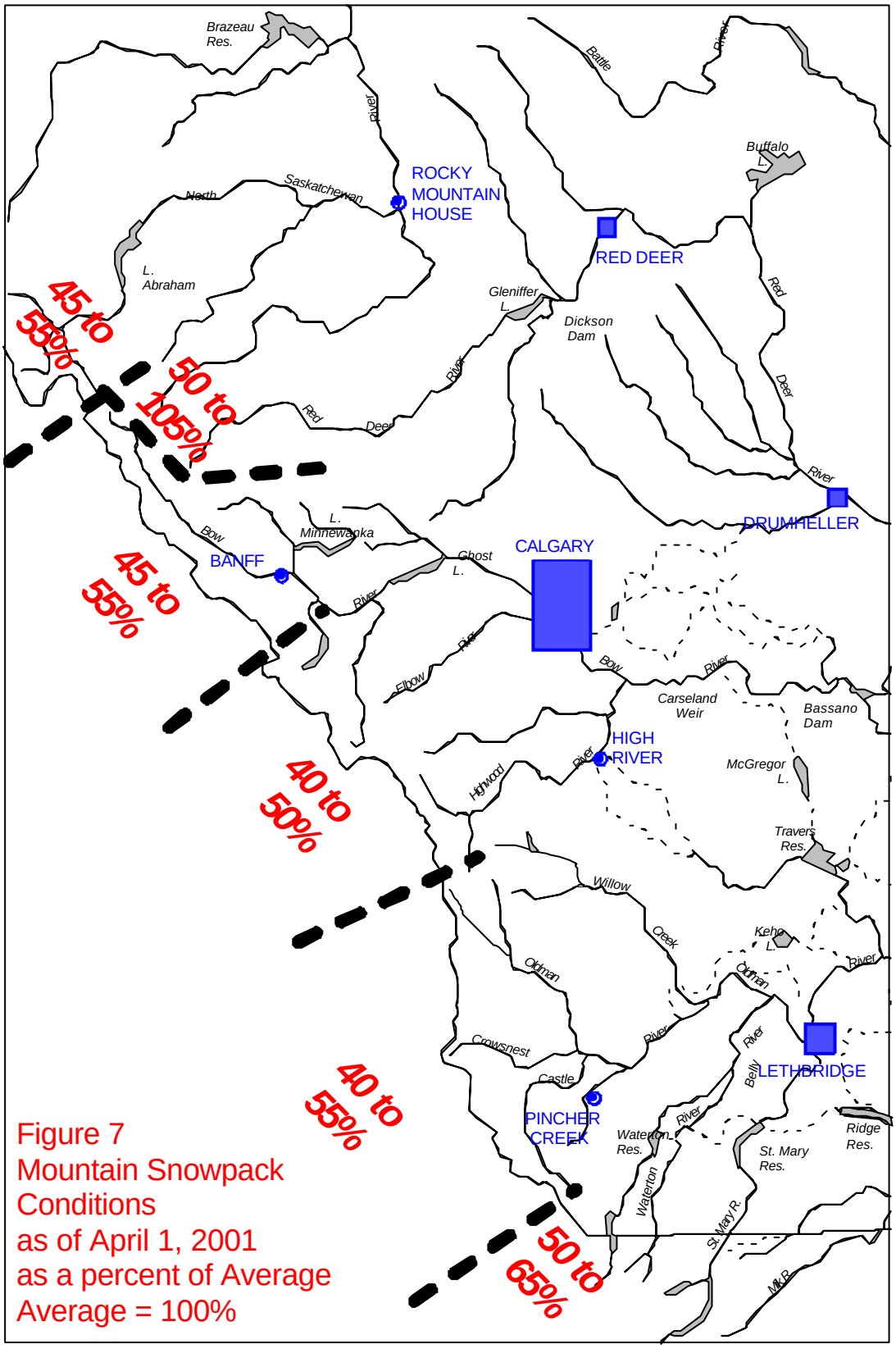

Figure 7
Mountain Snowpack Conditions
as of April 1, 2001
as a percent of Average
Average = 100%

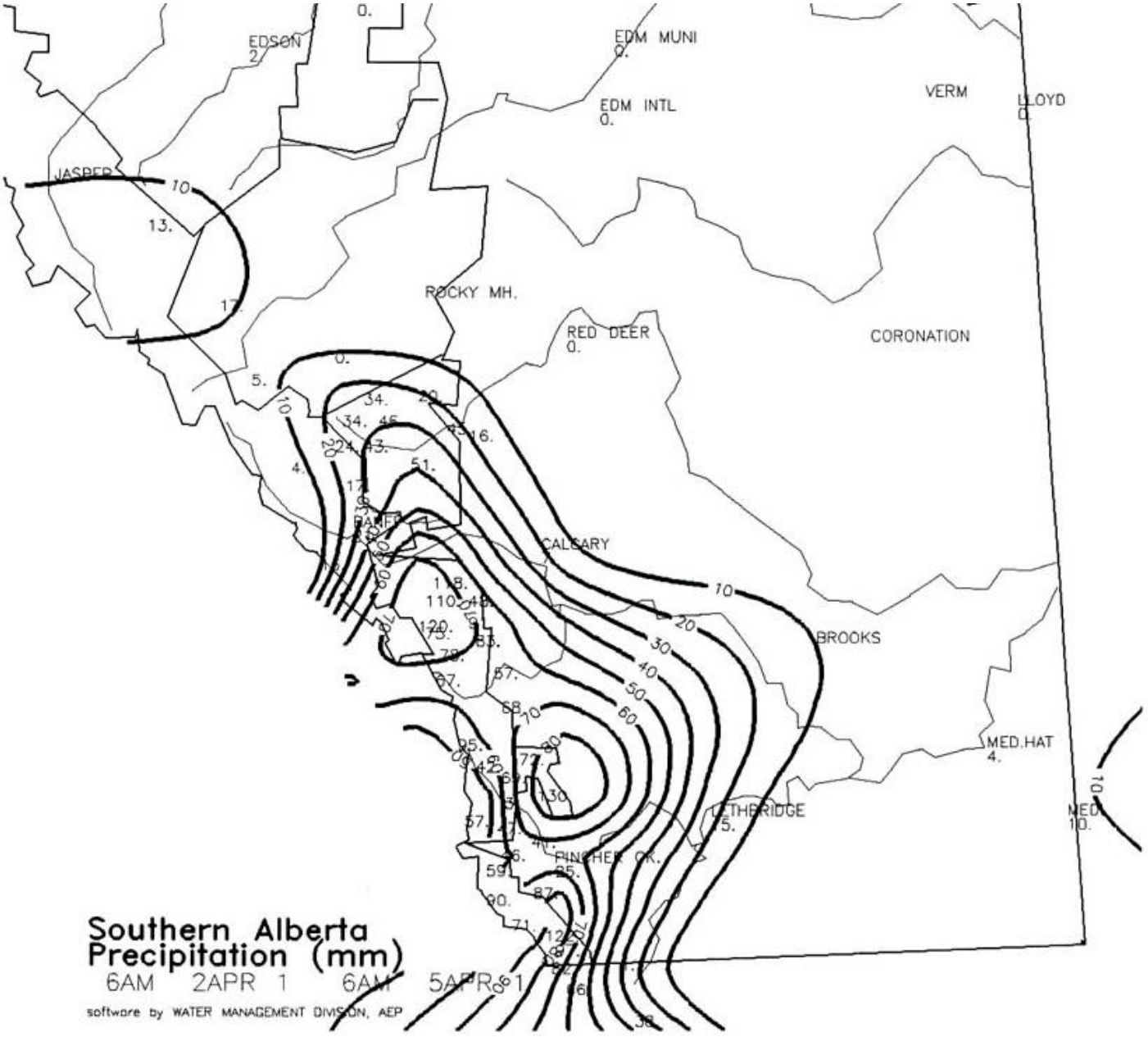

Figure 8

April 2 –5, 2001
Southern Alberta Snow Storm

Alberta
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