

Mountain Snow Conditions and Water Supply Forecasts for Alberta

December 2001



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 Hydrology Branch, Forecasting Section of the Department's Environmental Operations 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, Hydrology Branch, 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 of Current Conditions

Precipitation was generally below-normal in the province during the month of November except for a narrow northwest to southeast band of above-normal precipitation, extending from High Level to Medicine Hat. Precipitation on either side of this band was generally below-normal.

Snow accumulations in the mountains are near normal values for this time of the year with the exception of the headwaters of the Oldman River basin, which have below-normal accumulations due to the majority of the precipitation falling as rain in November and the melting of the early season snowpack. Normally the accumulation of snowpack at this time of the year accounts for one-fifth of the seasonal total.

Environment Canada's long-lead precipitation forecast for the December to February period indicates above-normal precipitation in the northern third of the province, normal precipitation in central areas, and below-normal in the southwestern portion of the province. The forecast for the spring period (March to May) is for above-normal precipitation in eastern areas of Alberta and normal precipitation elsewhere. The National Oceanic and Atmospheric Administration (NOAA) is forecasting normal precipitation for the province for the winter (December to February) and spring (March to May) periods.

Water storage as of December 1, 2001 in the major irrigation and hydroelectric reservoirs in the Bow and Oldman River basins is below-normal for this time of the season, with the exception of Keho Lake, Lake Newell and Crawling Valley Reservoir, which are normal. Storage conditions in the Oldman and Bow River basins are less than last year at this time. Water storage in the Red Deer and North Saskatchewan River basins are normal for this time of the season.

The Water Supply report will continue throughout the winter and will focus on the reporting of current conditions. In February, the Plains Runoff Outlook will be added to provide insight on runoff conditions for the plains area.

November Climatic Conditions

Precipitation was generally below-normal in the province during the month of November except for a narrow northwest to southeast band of above-normal precipitation, extending through the middle of the province from High Level to Medicine Hat (Figures 1 and 2). Precipitation on either side of this band was generally below-normal.

Long-Lead Precipitation Outlook

Environment Canada's long-lead precipitation forecast for the December to February period indicates above-normal precipitation in the northern third of the province, normal precipitation in central areas, and below-normal in the southwestern portion of the province. The forecast for the spring period (March to May) is for above-normal precipitation in eastern areas of Alberta and normal precipitation elsewhere. The National Oceanic and Atmospheric Administration (NOAA) is forecasting normal precipitation for the province for the winter (December to February) and spring (March to May) periods.

Reservoir Storage Conditions

Water storage in the major irrigation reservoirs of the Oldman River basin is below-normal for this time of the season, with the exception of Keho Lake, which is normal (Table 1).

Table 1 Status of Major Water Storage Reservoirs as of December 1, 2001 – Oldman River Basin

Reservoirs	Current Live Storage			Remarks	December 1, 2000 Live Storage	
	Volume in dam ³	Volume in acre-feet	Volume as % of Capacity		dam ³	acre-feet
Keho Lake	79,700	64,700	83	normal	81,200	65,900
Waterton Reservoir	64,100	52,000	38	below-normal	74,500	60,400
St. Mary Reservoir	34,700	28,200	9	below-normal	40,800	33,100
Ridge Reservoir	21,700	17,600	17	below-normal	28,400	23,000
Total	121,000	97,800	17	below-normal	144,000	117,000
Chin Reservoir	22,400	18,200	12	below-normal	89,100	72,200
Forty Mile Reservoir	9,250	7,500	11	below-normal	42,800	34,700
Total	31,700	25,700	11	below-normal	132,000	107,000
Oldman Reservoir	108,000	87,900	22	below-normal	274,000	222,000

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Water storage in most of the major hydroelectric and irrigation reservoirs in the Bow River basin is below-normal for the season, except for Lake Newell and Crawling Valley Reservoir, which are normal (Table 2).

Table 2 Status of Major Water Storage Reservoirs as of December 1, 2001 - Bow River Basin

Reservoirs	Current Live Storage			Remarks	December 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	below-normal	153,000	124,000
Spray Lake	91,000	73,800	51	below-normal	137,000	111,000
Upper Kananaskis Lake	54,200	44,000	53	below-normal	59,500	48,200
Lower Kananaskis Lake	51,200	41,500	81	below-normal	55,500	45,000
Total	334,000	271,000	59	below-normal	405,000	328,000
Lake McGregor	182,000	148,000	50	below-normal	309,000	250,000
Travers Reservoir	52,600	42,700	50	below-normal	54,200	44,000
Total	235,000	190,000	50	below-normal	363,000	294,000
Lake Newell	159,000	129,000	89	normal	159,000	129,000
Crawling Valley Reservoir	97,600	79,200	87	normal	102,000	82,400
Total	256,000	208,000	88	normal	260,000	211,000

Water storage in Glennifer Lake (Red Deer River basin) is normal for this time of the season (Table 3).

Table 3 Status of Major Water Storage Reservoirs as of December 1, 2001 – Red Deer River Basin

Reservoirs	Current Live Storage			Remarks	December 1, 2000 Live Storage	
	Volume in dam ³	Volume in acre-feet	Volume as a % of Capacity		dam ³	acre-feet
Glennifer Lake	154,000	125,000	76	normal	179,000	145,000

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 Water storage in the North Saskatchewan River basin major hydroelectric reservoirs is normal for this time of the year (Table 4).

**Table 4 Status of Major Water Storage Reservoirs as of December 1, 2001
 North Saskatchewan River Basin**

Reservoirs	Current Live Storage			Remarks	December 1, 2000 Live Storage	
	Volume in dam ³	Volume in acre-feet	Volume as a % of Capacity		dam ³	acre-feet
Lake Abraham	992,000	804,000	70	normal	1,048,000	850,000
Brazeau Reservoir	354,000	287,000	73	normal	412,000	334,000
Total	1,346,000	1,091,000	71	normal	1,460,000	1,184,000

Milk River Basin

Precipitation in the headwaters of the Milk River basin was below-normal for November as indicated by the accumulation of snow on the snow pillows at the higher elevations of the basin. Snow pillow information can be found on the department website, located at <http://www3.gov.ab.ca/env/water/WSWaterReports/Index.html>. Precipitation in the plains area was near normal during November (Figures 1 and 2).

Oldman River Basin

Precipitation in the headwaters of the Oldman River basin was below-normal for November and most fell as rain due to the above-normal temperatures recorded at the beginning of November (Figures 1 and 2). The above-normal temperatures experienced in the basin also melted the snowpack that was in place at the beginning in the month and as a result, snow pillow accumulation at the higher elevations indicate below-average values for this time of the year. Snow pillow information can be found on the department website, located at <http://www3.gov.ab.ca/env/water/WSWaterReports/Index.html>. Precipitation in the plains area was below-normal in November (Figures 1 and 2).

Bow River Basin

Precipitation in the headwaters of the Bow River basin was near normal for November as indicated by the accumulation of snow on the snow pillows at the higher elevations of the basin. Snow pillow information can be found on the department website, located at <http://www3.gov.ab.ca/env/water/WSWaterReports/Index.html>. Precipitation in the plains area was above-normal in the Calgary area (Figures 1 and 2).

Red Deer River Basin

Precipitation during November in the Red Deer River basin was normal to above-normal (Figures 1 and 2). Snow accumulation on the snow pillows is normal to above-normal for this time of the year. Snow pillow information can be found on the department website, located at: <http://www3.gov.ab.ca/env/water/WSWaterReports/Index.html>.

North Saskatchewan River Basin

Precipitation in the North Saskatchewan River basin ranged from below-normal to normal (Figures 1 and 2). There is no snow pillow information for the North Saskatchewan River basin.

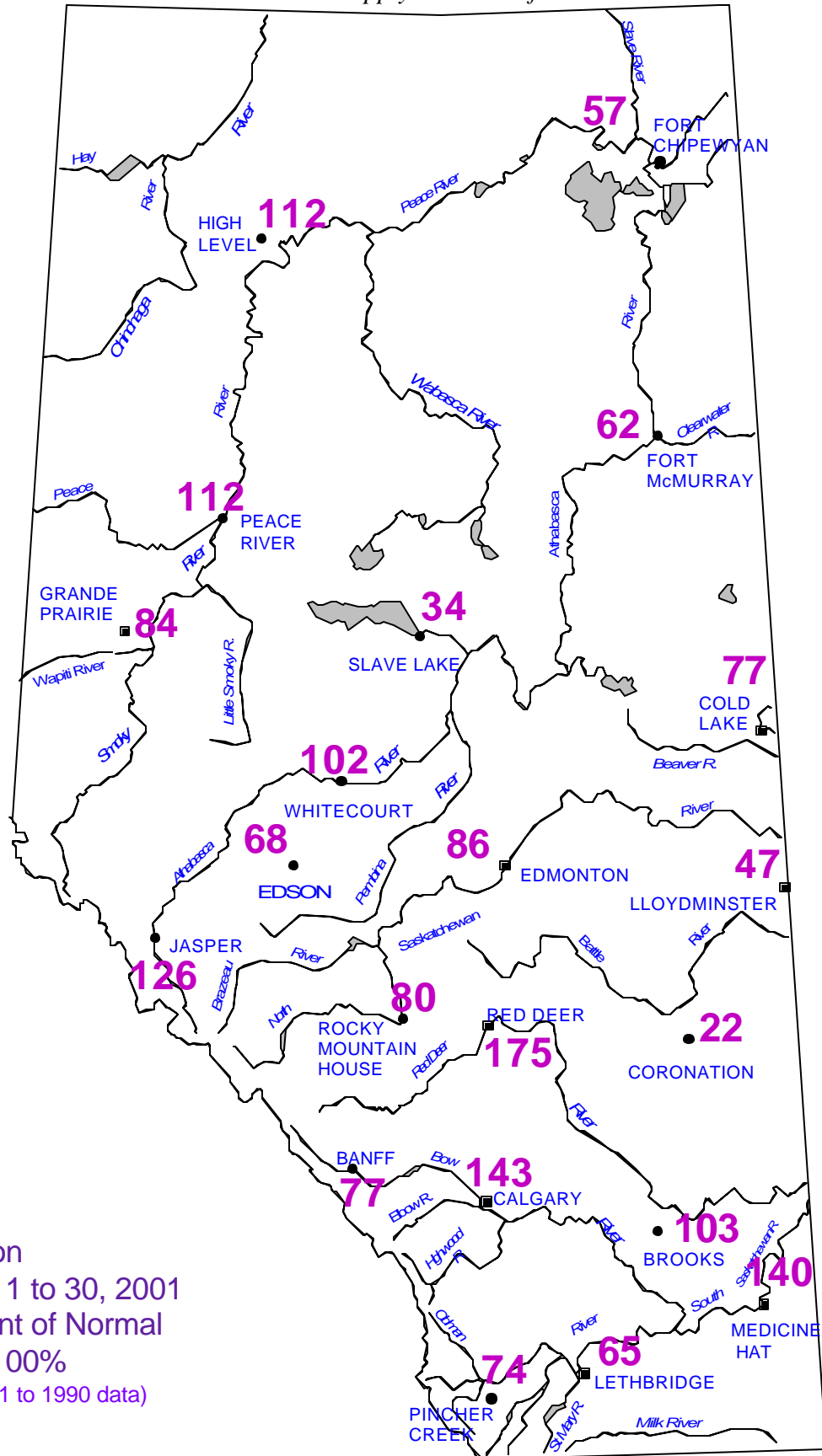


Figure 1
 Precipitation
 November 1 to 30, 2001
 as a percent of Normal
 Normal = 100%
 (based on 1961 to 1990 data)

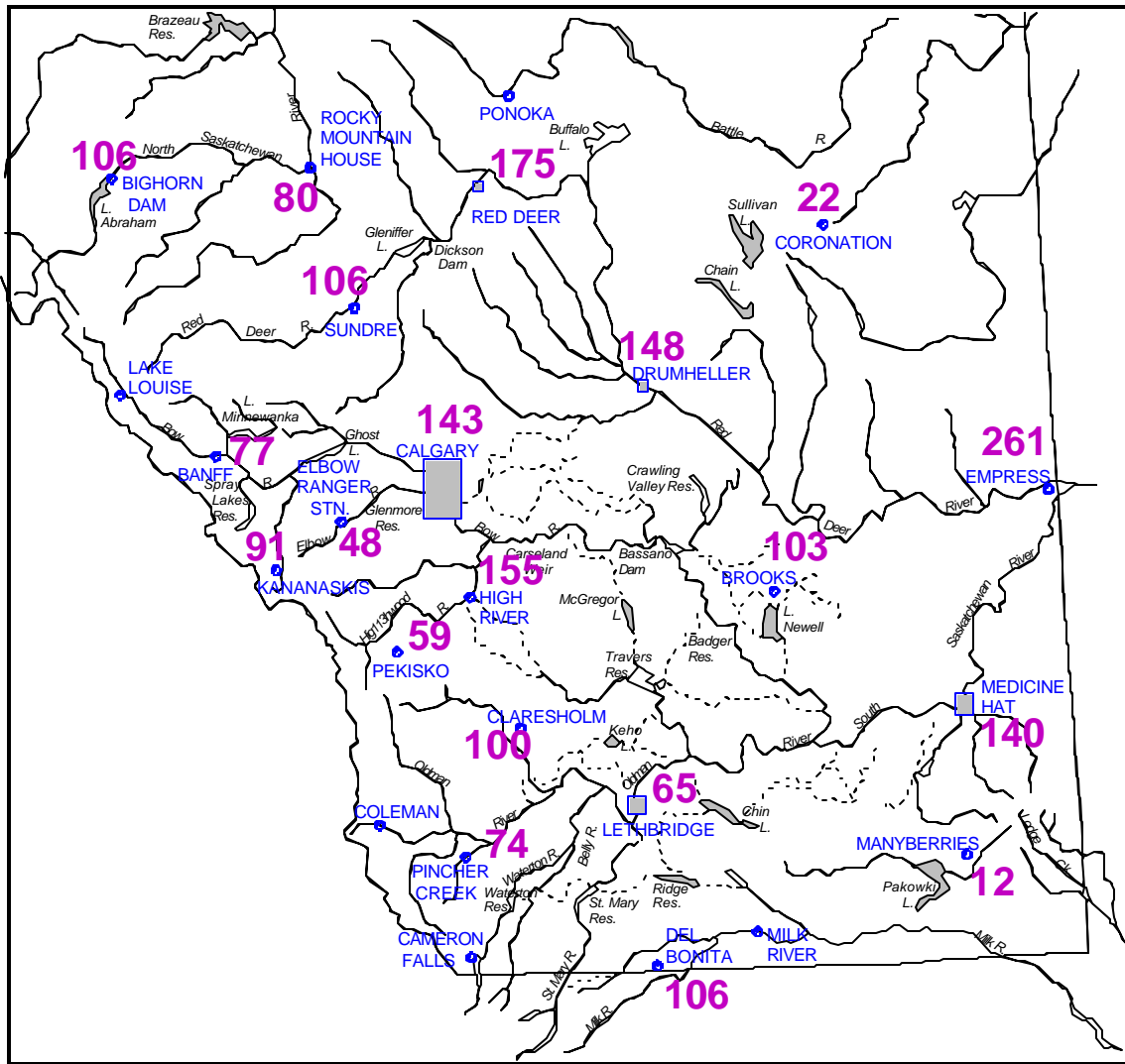


Figure 2
Precipitation
Southern Alberta
November 1 to 30, 2001
as a percent of Normal
Normal = 100%
 (based on 1961 to 1990 data)