

June 7, 1831: Weather became more Settled the water continues rising; our Hay Ground of Last year is in one complete Lake. (ibid)

June 8, 1831: ...the River is too High for Crossing either on foot or on Horseback. (ibid)

June 12, 1831: weather Cloudy raining at times. the River Still rising all the low Ground Covered with water. (ibid)

June 17, 1831: Rained most of the night very warm to day...Millar went to the Crossing place...and Says the River has rose about 4 feet and thinks from the Height of Water that the Gardens at Lower fort is all overflowed. (ibid)

June 28, 1831: The Same Sultry weather...nearly all the Gardens below are destroyed by the High waters. (ibid)

July 2, 1831: heavy rain during the night...the Ground is so completely drenched with Water that nothing can be done to [the potatoes] the Hay Ground is also covered with water. (ibid)

July 24, 1831: Raining most of the day, was not the River So High we might be able to obtain a livelihood on fish but there is no possibility of making a Barrier. (ibid)

August 20, 1831: the rest of us Carrying the Hay that was cut to dry Ground as the Late rains has almost Set it a float. (ibid)

- no information exists about the Red but given the apparently normal spring runoff and very wet summer in the Assiniboine basin, it is not unreasonable that the Red had at least normal runoff

1831-32

- NORMAL

- severe weather in December, 1831, with little snow

December 20, 1831: Unusually severe has it hitherto been from 10 to 28 below zero during what has passed of this month with little or no Snow... (George Simpson to Donald Ross, quoted in Williams, G. [ed.], 1975. Hudson's Bay Miscellany, 1670-1870. Hudson's Bay Record Society, Winnipeg, Manitoba, p. 160)

- strong thawing beginning in late March at Fort Pelly produced an early freshet

March 23, 1832: Thermometer rose as high as 37 above 0. the Snow nearly dissolved...Rained a little this Evening. (Fort Pelly Journal, HBCA B.159/a/13 1831-32)

March 30: ...the Small Creeks nearly overflow their banks, the Snow, except in the woods & Sheltered places was entirely dissolved and very little water in the Plains. (ibid)

- breakup of the Red occurred in mid-April

April 18, 1832: The [Red] River being now clear of ice, as far as Netley Creek, and most of the snow thawed. (Rev. W. Cochran's Journal, PAM MG7 B2 CMS A85)

- by late April, fears were expressed at Fort Pelly about the possible low water in the Assiniboine

April 25, 1832: Remarkable dry Weather, the rivers getting very low and we fear there will be much difficulty in getting everything down. (Fort Pelly Journal, op. cit.)

- heavy snow fell in early May but generally warm, dry weather was reported from both Fort Pelly and the Red River Settlement

- the summer seems to have been rather wet

June 14, 1832: Heavy and incessant rains are falling in this neighbourhood. The ground is deluged, the wheat and barley look sickly and many potatoes which are planted on wet soil are rotting. (Cochran Journal, op. cit.)

July 1832: The whole season has been unfavourable. we had heavy falls of rain & hard frost up to the 20th of May. About the 24th the weather became genial. This left us very little time to put down a crop. About the 10th of June heavy and constant rains commenced... (Cochran Journal, op. cit.)

- very early frosts occurred in the Red River Settlement and as far south as southern Minnesota

August 19, 1832: This morning the air was excessively cold, a thick hoar frost covered the ground and the stagnant waters of the swamps were frozen...The potato tops are blasted. (Cochran's Journal, op. cit.)

August 30, 1832: A most unexpected frost last night which completely cut down everything in the shape of vegetation; there are many sorrowful faces at Red River to day as by far the greatest part of the wheat is in an unripe state. (Rev. David Jones Journal, PAM MG7 B2 CMS A92)

September 1, 1832: The third day out it commenced raining and we had a tremendous storm and all at once a little before sundown the wind changed from the southeast to west and blew a gale for an hour or two. It was very cold and it actually froze ice, and the next morning there was not a leaf hardly but what was frozen stiff, and all the gardens spoiled [at Traverse de Sioux]. (Philander Prescott, in Parker, D.M. (ed.), 1966. The Recollections of Philander Prescott, Frontiersman of the Old Northwest, 1819-1862. University of Nebraska Press, Lincoln, Nebraska, p. 134)

- although it is unlikely that streamflow was ever particularly high in either the spring or summer, neither are there indications that the Red or the Assiniboine were unusually low and there seems to have been ample spring rainfall to compensate for a reduced freshet and produce runoff in the normal range

1832-33

- NORMAL

- early fall was cold and "disagreeable" but mild weather in late October and November delayed freezeup until late in the month

November 26, 1832: It is a surprising proof of the mildness of the season that no snow remained on the ground yet, which generally is the case every year six weeks before this (Rev. David Jones' Journal. PAM MG7 B2 CMS A92)

- heavy snow and some cold weather occurred in early January but mild weather returned

before the end of the month

January 21, 1833: Weather unseasonably mild-the snow quite soft and the eaves of the houses in the middle of the day dripping like in spring weather. (ibid)

- late February was exceptionally cold but very warm weather occurred in early March and alternated with cold weather until mid-March when a thaw set in lasting into the first week of April

March 16, 1833: fine weather...snow fast diminishing. (Fort Pelly Journal, B.159/a/14 1832-33)

March 29, 1833: I proceeded to the Stone Fort on horseback the Snow being nearly all melted away and too much black earth for the cariole to draw...The water has been collecting on the sides of the river on the surface of the ice for some time but the middle was considered hard and strong...my horse went through...The rush of water under the ice was tremendous. (Jones Journal, op. cit.)

- colder weather and snow after the first week of April delayed breakup of the Assiniboine at Fort Pelly until April 23

- heavy rain fell in late April and particularly in early May

May 6, 1833: [late in the evening] the rain was falling in torrents and the swamps were so deep that my horse could not carry me. I was obliged to plunge through them on foot. In some places I sink above the knees in withered reeds and water. The frost was still in the bottom... (Rev. W. Cochran's Journal, PAM MG7 B2 CMS A85)

- rain, often described as "constant", was reported at Fort Pelly on all but 4 days from May 4 to May 19, causing a rise in the Assiniboine

May 19, 1833: raining great part of day the [Assiniboine] River is now unusually high and Still Rising. (Fort Pelly Journal, op. cit.)

- there are no other records until September but it appears that the summer continued to be wet

September 7, 1833: from the heavy and constant rain during the Summer this part of the country may be said to have been under water in Several places... (ibid)

September 20, 1833: ...Since the commencement of harvest, there has been a great and incessant struggle. The weather has been boisterous, gloomy and moist. (Cochran's Journal, op. cit.)

September 28, 1833: The wind veered to the north and brought such a torrent of rain upon us, as I have never before witnessed, the plains are deluged, and the creeks run as deep as in the spring...(ibid)

- there is little reference to the rivers, apart from the high state of the upper Assiniboine in May, but the abundant rainfall suggests that runoff would have been normal, at least

1833-34**- LOW**

- cold weather set in early in October, 1833, at Fort Pelly
 - October 18, 1833: Weather excessively cold for this season of the year. (Fort Pelly Journal, HBCA B.159/a/15 1833-34)
 - October 20, 1833: fine Weather ice drifting in the [Assiniboine] River. (ibid)
- virtually no snow fell at Fort Pelly through November
 - November 7, 1833: ...no snow and the ground hard froze. (ibid)
 - November 21, 1833: [Indians unable] to follow the tracks of animals from want of snow. (ibid)
- temperatures fluctuated between cold and mild through January and lack of snow continued to be a problem at Fort Pelly throughout February
 - February 17, 1834: ...no snow on the ground [on trip to Beaver Creek] nor has there been sufficient for trains any time during the winter. (ibid)
- some snow fell in March but was usually quickly removed by subsequent milder weather
- spring was very early
 - April 2, 1834: the geese are flying; the trees are budding; the earth appears again. (Rev. W. Cochran's Journal, PAM MG7 B2 CMS A85)
 - April 9, 1834: the snow was now nearly all dissolved and the surface of the earth beginning to be soft. This is the earliest spring I have seen in Red River, it is just one month earlier than it was the year of the Deluge. (ibid)
- a short-lived rise occurred in the upper Assiniboine at Fort Pelly (April 11) but by April 16, it was falling
 - April 16, 1834: ...River falling fast. (Fort Pelly Journal, op. cit.)
 - April 21, 1834: ...the State of the water [still falling off] makes me anxious to get [the boats] down as soon as possible. (ibid)
- the weather at Fort Pelly in May was mixed cool and warm with some rain
- there are no records between mid-May and mid-August; there had been sufficient rain to produce an excellent harvest at the Red River Settlement
 - September 9: Our harvest which is finished...is good. The people do not complain. The wheat and all the grains are very beautiful...Here we have had great heat and beautiful weather for the entire growing and harvest season. (Letter, J.N.Provencher, Eveque de Juliopolis, St. Boniface de la Riviere Rouge, to Monsieur J. Signay, Eveque de Quebec, 4 Septembre, 1834, in Lettres de Monseigneur Joseph-Norbert Provencher, Premier Eveque de Sant-Boniface, Bulletin de la Societe Historique de Saint-Boniface, vol. III, 1913, Imprimerie du Manitoba, Saint-Boniface, Man., p. 141-142)
- in late September, the water levels were described as low
 - September 26, 1834: cold severe weather arrived at mid-day Just 20 days from Red River Settlement where I left every thing quiet with abundant crops had some delay in the Lakes from Stormy Weather also in the Rivers from the unusual low state of the water... (Fort Pelly Journal, op.

cit.)

- there is no indication of severely low water and certainly no drought but from the early ending of the freshet on the Assiniboine, the late summer reference to low water in the rivers, and the lack of any evidence for abundant rainfall, it is likely that runoff was somewhat low

1834-35

- INCONCLUSIVE

- the early fall, 1834, was very cold with snow at Fort Pelly and early freezeup of the Red
October 25, 1834: Was prevented from visiting the Indian Settlement owing to the state of the River, which is now froze but not sufficiently strong to carry the weight of a person. (Rev. W. Cochran's Journals, PAM MG7 B2 CMS A85)

- milder weather with little snow occurred in November

December 1, 1834: The Settlement has not been healthy this fall, though the weather has been unusually fine;...The weather is still mild, and not snow enough yet to run our carioles... (Letter, Thomas Simpson, Fort Garry, to James Hargrave, dated Fort Garry, 1st Decr 1834, in The Hargrave Correspondence, 1821-1843. Greenwood Press, Publishers, New York, p. 160)

- the first heavy snowfall occurred in early January

January 10, 1835: The weather cold and stormy, the snow drifting to suffocation the track invisible by the heavy fall of snow. (Cochran Journals, op. cit.)

February 27, 1835: We have had our full share of cold this winter which has been a strange one, December intense cold and thaws by turns, January mild, even warm, and February most severe; this very morning we had it 20 below zero and blowing a gale at same time. (Letter, Thomas Simpson, Fort Garry, to James Hargrave, dated Fort Garry, 27 February 1835, in The Hargrave Correspondence, op. cit., p. 187)

- March was generally mild and snow conditions were very different in the upper Assiniboine and Red River Valley; the snow almost disappeared at Fort Pelly and to the west but remained significant near the Red River Settlement

March 19, 1835: ...the snow has nearly disappeared. (Fort Pelly Journal, op. cit.)

March 20, 1835: The weather exceedingly stormy, a strong wind blowing from the north with much snow which rendered the track invisible, the drift flying thick almost to suffocation...The drifts in many parts were as high as the tops of the bushes. (Cochran Journal, op. cit.)

March 30, 1835: ...the Snow has now entirely disappeared in the woods as well as the plains. (Fort Pelly Journal, op. cit.)

April 3, 1835: The track to the Indian Settlement is so full of drifts of snow, that it requires about four hours to perform the journey. (Cochran Journal, op. cit.)

- much colder weather occurred after April 10 and continued to the end of April and into May

- the upper Assiniboine was expected to be low

April 21, 1835: therm 22 above Stormy Weather...from the Rivers being still fast we are now at a stand...[sending goods by water] I believe will be entirely out of the question as there is every prospect of the Rivers being unusually low. (Fort Pelly Journal, op. cit.)

April 26, 1835: Cold disagreeable Weather with Snow forwarded the Batteaux to Beaver Creek in consequence of the very low state of the water. (ibid)

May 13, 1835: Still blowing Strong from the South some rain fell in course of the day...Jack Easter returned from Beaver Creek he was nine days getting there he has not seen the water so low for 40 years. (ibid)

- by June, excessive heat and dryness was reported in Red River Settlement

June 5, 1835: We had a short winter and not very cold. The snow was all melted at the end of March. We had the reverse in April and May. Now the weather is too dry. (Msg. J.N.Provencher, Eveque de Juliopolis, to Msg. J.I.Lartigne, Eveque de Telemesse, dated Riviere Rouge, 5 juin, 1835, PAM MG7 D1)

- very little additional useful information is reported in July and August; some comments continue to refer to excessive heat and in August, frequent rain, which must have been sufficient to produce an abundant harvest

- the upper Assiniboine was clearly very dry but snow conditions in March and April in the Red River Valley seem to have been quite different; although it is likely that runoff was somewhat low, there is insufficient information to be confident of this

1835-36

- NORMAL

- winter set in early, with cold weather, rain, snow and freezeup in October

October 20, 1835: A perfect winter day, snowing and drifting furiously from morning to evening. (Rev. David Jones' Journals, PAM, MG7 B2 CMS A92)

October 25, 1835: Was prevented from visiting the Indian Settlement owing to the state of the River which is now froze but not sufficiently strong to carry the weight of a person. (ibid)

- severely cold weather apparently continued through the entire period from late October though much of March with no indication of a break

March 12, 1836: Weather continues in its full severity and no symptom of winter breaking up. (ibid)

- by the end of March, however, strong thawing conditions set in

March 26, 1836: Rain and sleet all day & the snow melting fast...the ground covered with slush more than half knee deep. (ibid)

March 31: The roads are now nearly impassable with melted snow. (ibid)

- early April brought considerable precipitation and although breakup occurred in mid-April, the latter half of the month was colder

April 3, 1836: ...the morning was very gloomy. All the ground covered with snow excepting a few patches of earth here and there which had been laid bare by the sun of the last two days... (ibid)

April 6, 1836: A heavy rain last [night] and subsequently a warm morning; but the wind veered to the North in the middle of the day and brought on sleet and snow again. (ibid)

April 12, 1836: A good deal of snow fell last night again but the air is generally warm. The ice moved a few yards in the afternoon. (ibid)

April 15: The ice went off for good and all to day. Weather piercingly cold. (ibid)

April 29, 1836: Weather seems warm in earnest at last. (ibid)

- May was dry and by the end of the month, complaints of drought began

May 28, 1836: ...the drought however is severe and keeps every thing very backward. (ibid)

May 30, 1836: The drought is very severe; there was a slight shower with thunder in the afternoon but it soon passed away again. (ibid)

- rain fell in June and July in sufficient quantity to permit crop growth

June 6, 1836: Soon after retiring last night we were disturbed by the approach of a thunder storm and the sound of abundance of rain, which nature has been gasping and panting for, for weeks past. (ibid)

June 30, 1836: We were overtaken between Grantstown and this little Settlement by a most terrific thunderstorm which drenched us terribly. (ibid)

July 3, 1836: while at Church a heavy rain came on which continued till after I returned from the Middle Church... (ibid)

August 18, 1836: Commenced reaping barley. It is not a great crop, the drought early in the spring prevented it succeeding according to expectation. (Rev. W. Cochran's Journals, PAM MG7 B2 CMS A85)

- a day after this last entry, much of the crop was killed by frost

August 19, 1836: On the 19th of August we were visited by a most destructive frost which destroyed the reward of the farmer as to [wheat]; it was truly a gloomy morning the whole of the vegetable world drooped and blackened as the sun grew warm...All garden seeds have been destroyed so that our prospects for next summer are most desolate... (Letter, Rev. D. Jones to Rev. Wm. Jowett, Church Missionary House, Salisbury Court, London, dated Red River Settlement, July 21, 1836, PAM MG7 B2 CMS A92)

- the remainder of August and September were generally cool and frequently wet

- apart from the very dry late May and June, there is nothing to indicate abnormal conditions in the rivers. On October 13, 1836, Provencher reported that according to Father Belcourt at Pembina, winter was long and hard, there was more snow than usual and there were fears of another flood (which didn't happen). Thus it seems that the freshet at least was probably normal.

1836-37**- LOW****- the fall and early winter of 1836 was relatively mild**

December 1, 1836: The autumn had been long and beautiful, and the snow had not yet cast its white mantle upon the earth. (Simpson, Thomas, reprinted 1970. Narrative of the Discoveries of the North Coast of America, vol. 1, 2nd. ed., Canadiana House, Toronto, p. 26)

November-January, 1836-37: The season continued cold, drizzly, and frosty, till the latter end of October...after that, however, the weather became unusually mild and pleasant, insomuch that men were whistling at the plough on the 12th of November, and hauling their carts without snow, till the 14th of January 1837. (Ross, A., 1957 [reprint]. The Red River Settlement: Its Rise, Progress, and Present State. Ross and Haines, Minneapolis, Minnesota, p. 188)

- mild weather was reported into early February but became cold by mid-February, and March was very cold and stormy with considerable snow

February 28, 1837: ...bad walking-snow deep [between Red River Settlement and Pembina]. (Martin McLeod in Nute, G.L., 1922. Diary of Martin McLeod. Minnesota History Bulletin, vol. 4, p. 408)

March 4, 1837: Came a long distance today, snow deep and very heavy...[on south branch of Park River]. (ibid, p. 409)

March 6, 1837: Bad walking. Snow deep...The further Southward we come, the more snow we find [south of Pembina]. (ibid, p. 410)

March 17, 1837: ...suddenly...a storm from the North came on that no pen can describe...I was then completely wet through for a shower of sleet had accompanied the storm...The night came, the storm continued unabated...[near lake Traverse]. (ibid, p. 413)

- the snow seems to have been greater in the southern Red River Valley (south of Pembina) than at the Red River Settlement since William Cochran reported

April 24, 1837: Very little snow has fallen during the winter, this has exposed the ground to all the ... influence of a dry cold which is more pernicious to agriculture than any summer drought. There are fissures in the earth sufficiently wide at the surface to admit the foot of a horse or ox. These run in every direction dividing the ground into small pieces of two or three yards square, thus all the moisture has evaporated and the frost has gone to an unusual depth. As there is no water from the melting snow and no rain to enter the earth and thaw it, all beneath 4 inches on the surface...down to a depth of 4 feet is as hard and dry as rock, and cold as ice. (Rev. W. Cochran's Journal, PAM MG7 B2 CMS A85)

- breakup was late and cold dry weather continued into May

April 13, 1837: ...The ice in the river is as solid as in December. Since the year of the deluge I have not seen so late a spring. (Rev. D. Jones' Journal, PAM MG7 B2 CMS A92)

April 26, 1837: Since ...[April 13] the weather has been very favourable and gloomy. This day the ice moved about twenty yards and then choked up again. (Cochran Journal, op. cit.)

April 30, 1837: ...crossed the river in a canoe [at the Indian Settlement] the ice had moved down toward the Lake. (ibid)

May 10, 1837: The state of the weather has kept every thing in a most desponding state. Cold bleak winds from the North and every morning ice half an inch thick. (Jones Journal, op. cit.)

May 22, 1837: The weather continues dry, cold and stormy. Very little of the wheat that we have sown is germinating...At present a great quantity of the wheat which was sown 3 weeks ago, is as dry as when in store. (Cochran Journal, op. cit.)

- warm weather and some rain didn't arrive until June but frost continued to be common at night

June 6, 1837: Still nightly frosts destroying every hope of the husbandman. (Jones Journal, op. cit.)

June 8, 1837: At night there was thunder and rain and in the afternoon the object of many prayers was granted in a fine general rain which fell without violence and without ceasing the whole of the evening. (ibid)

June 11, 1837: This evening we were favoured with a weighty shower of rain that saturated the ground 4 inches in depth. Few can conceive the gratitude that was felt in many a bosom to God for this refreshing shower. We have had no rain since September and scarcely any snow during winter consequently everything is parched, and no appearance of summer... (Cochran Journal, op. cit.)

June 29, 1837: There was a severe frost last night which cut down all the potatoes in many places! (Jones Journal, op. cit.)

- in July, Provencher reported

July 4, 1837: ...The weather has been too cold and too dry. There wasn't [much] snow and this spring there wasn't much moisture in the ground... (Letter, J.N.Provencher, St. Boniface de la Riviere Rouge, to Monseigneur J.I.Lartigne, Eeveque de Montreal, 4 July 1837, PAM MG7 D1)

- sufficient rain fell in July to improve the crop prospects

October 13, 1837: In the spring, I may say to the latter end of June, all vegetation was checked by cold and drought. After the rain began to fall it came in such torrents that all the corn and potatoes were prostrated to the earth, and before they would have time to recover and look up, there would be another heavy shower, carried by tempestuous wind and hurled upon them... (Cochran's Journal, op. cit.)

- September was very wet

September 6, 1837: ...heavy rain and miry track. On arrival [at the Indian Settlement] found the roof of our house had fallen in from the weight of water that lodged in the thatch. (ibid)

September 11, 1837: The weather extremely unfavourable for harvest, the ground covered with water. (ibid)

September 17, 1837: The weather rainy and extremely cold...The water is higher than the knee of the horse. (ibid)

September 22-23, 1837: ...the weather wet and cold. (ibid)

- despite the late summer precipitation, the apparent lack of snow in the winter and spring drought suggest that water levels and runoff were probably low. This is supported by the general reference to low waters in the rivers in the Fort Pelly Journal in September.

September 14, 1837: ...an unusual long voyage [from York Factory due to] the low State of the Water in the Rivers after leaving Norway House, particularly Shoal River... (Fort Pelly Journal, HBCA B.159/a/17 1837-38)

1837-38**- NORMAL**

- the wet conditions of September, 1837, continued through most of October, which was also cold

October 8, 1837: Most disagreeable Weather with thunder lightning & Constant rain. (Fort Pelly Journal, HBCA B.159/a/17 1837-38)

October 10, 1837: towards Mid day it commenced Snowing which continued without ceasing the remainder of the day. (ibid)

October 15, 1837: returned late, for miles the track was covered with water, froze thinly on the top, the ice too weak to carry the horse. (Rev. Wm. Cochran's Journal, PAM MG7 B2 CMS A85)

- several heavy snowfalls occurred at Fort Pelly in November
- by mid-January, the snow was being reported as deep

January 14, 1838: Travelling is now very heavy from the great depth of snow. (Fort Pelly Journal, op. cit.)

January 17, 1838: ...the track invisible in many parts with fresh drifts...(Cochran Journal, op. cit.)

- February brought more snow and generally cold weather

February 24, 1838: ...a constant fall of snow with Stormy weather which continued the whole of the Journey [to Fort Ellice]. (Fort Pelly Journal, op. cit.)

- mild weather and thawing conditions began after the first week of March and continued until the end of the month when an early spring arrived

March 29, 1838: geese and Ducks Seen an extraordinary occurrence at this Season the River is also reported open in Several places. (ibid)

March 31, 1838: ...frogs heard another unusual occurrence in the Month of March. (ibid)

April 4, 1838: ...the [Assiniboine] River was perfectly clear of ice. (ibid)

April 4, 1838: ...the river impassable. (Cochran Journal, op. cit.)

April 8, 1838: Went down to the Settlement. The track miry and the water in the swamps covered with new ice...The river being here in a much worse state than I anticipated, the ice being piled up about twenty yards from the shore. (ibid)

- the water in the Assiniboine was reported to be high

April 12, 1838: ...as the [Assiniboine] River is now high [some men] had to be crossed with a Canoe. (Fort Pelly Journal, op. cit.)

- additional snow fell from mid-April onward but by April 26, the Assiniboine at Fort Pelly was falling

April 26, 1838: ...the snow has now disappeared without adding to the Water in the [Assiniboine] River which Still continues to fall off. (ibid)

- the level of the Red is not clear but was probably normal

May 2, 1838: The wind blowing strong from the north, the waves running high was nearly swamped in crossing the River. (Cochran Journal, op. cit.)

- the first half of May was dry but rain and snow fell at both Fort Pelly and the Red River Settlement in the second half

May 19, 1838: in consequence of heavy rain in the morning I was unable to take my departure till after Mid-day. (Fort Pelly Journal, op. cit.)

May 22, 1838: The ground covered with snow. (Cochran Journal, op. cit.)

May 30, 1838: Heavy rain all day... (ibid)

- June was hot (although a frost occurred on June 7) and wet

June 2, 1838: The heat is intense. The morning delightful after a heavy rain. (Rev. D. Jones' Journal, PAM MG7 B2 CMS A92)

June 21, 1838: Thunder and heavy rain. All our crops are covered with water. (Cochran Journal, op. cit.)

June 30, 1838: Tremendous thunder and torrents of rain which I fear will much injure the crops. (Jones Journal, op. cit.)

- several heavy rainfalls were reported among the few entries for July; no entries exist for August

- the (brief) high water reported in the Assiniboine, the apparently not-unusually noteworthy state of the Red in the spring, and the wet period in late-May and June suggests runoff in the normal range

1838-39

- NORMAL

- the few entries that exist for the fall of 1838 suggest that October and November were cold with significant snowfall

- cold and excessively cold was generally reported in December and January, again with significant snowfall

January 13, 1839: ...Snow very deep. (Red River Journal, HBCA B.235/a/14 1839)

January 28, 1839: ...the weather stormy and excessively cold, snow drifting so thick as to render the track invisible. (Rev. W. Cochran's Journal, PAM MG7 B2 CMS A85)

- temperatures rose in February and rapid thawing was reported at mid-month

February 19, 1839: ...rapid Thaw Snow disappearing fast (Red River Journal, op. cit.)

- by the end of February, however, more snow fell on several days and temperatures had become cold again

- several heavy snowfalls occurred in the first half of March with some periods of mild weather; by late March, thawing conditions became general and spring arrived in the first

week of April

March 31, 1839: The ice on the river covered with water. (Cochran Journal, op. cit.)

April 7, 1839: The plains covered with water and ...melted snow, thinly crusted with ice. (ibid)

April 8, 1839: River open in places. (Red River Journal, op. cit.)

- May was alternately very warm and cool and relatively dry but with some rain toward the end of the month

- June was very hot and no rain was reported; when rain arrived in early July, it was welcomed

July 4, 1839: Returned in the evening, heavy rain and loud thunder...The rain was much required, the fields were yawning for it. Many of these openings in the wheat were sufficiently wide to admit the hand to be pushed down 8 inches. Had the drought continued many days longer, my fields of wheat would have been dried from the roots. (Cochran Journal, op. cit.)

- by mid-August, the summer was described as dry and warm

August 12, 1839: This has been one of the finest Summers I have ever passed in the Indian Country- The weather was exceedingly dry and warm, but the heavy dews at night prevented its being injurious to the crops which are more abundant than anticipated. (Letter, John Ballendeen, Fort Garry, to James Hargrave, dated Fort Garry, Red River Settlement, 12th August, 1839, in The Hargrave Correspondence, 1821-1843. Greenwood Press, Publishers, New York, p. 304-5)

- rain fell on 11 of the 16 days from August 25 to September 9 but very little fell after that to the end of September

- although there are few references to water levels, there seems to have been sufficient late winter snowfall to produce spring runoff in the normal range

1839-40**- NORMAL**

- the fall of 1839 was not especially severe and after rain in early October, precipitation was light

December 4, 1839: The track so rough and so little snow upon it... (Rev. W. Cochran's Journal, PAM, MG7 B2 CMS A85)

- from late in December through February, the weather was generally very cold with abundant snow

January 18, 1840: The wind was blowing strong and snow as fine as dust drifting along made it impossible to see the track. I know it would be scarce possible to get the Cariole through the deep snow... In the afternoon the wind abated considerably so that I was not much troubled by the drifting of the snow but what had fallen was so deep that my horse...could scarce get through it. (J. Smithhurst's Journals [at Indian Settlement], PAM MG7 B2 CMS A96)

February 6, 1840: At this time the ice upon the river in front of my house is near 4 feet thick... (ibid)

February 22, 1840: It has been a most winterly day...the wind was blowing so strong and the snow drifting in such a way that it was with great difficulty the boy could get my horse to face it. (ibid)

- there is no information about March but thawing conditions were occurring by early April
April 4, 1840: ...I had a most disagreeable ride owing to the Thaw. The horse was up to the knees in mud and water most of the way. (ibid)

- most of April seems to have been cold, however, and breakup of the Red was late
April 13, 1840: It has been a cold winterly day the wind blowing fresh from the North with drifting snow. (ibid)

April 25, 1840: ...the River is in such a state that it is unsafe to walk across and the ice is not sufficiently broke up to cross in a canoe... (ibid)

- May weather seems to have been normal, with some rain but by the end of the month, “oppressive” heat was reported and June and July were very dry
June 6, 1840: In the early part of the spring. the weather had been so very cold and backward, that serious apprehensions were entertained that the crops would be indifferent, but such a favourable change took place, about the latter part of May, that they improved so rapidly as to be...of a very promising aspect. (Cochran’s Journal, op. cit.)

July 14, 1840: The weather intensely hot and dry. (ibid)

August 6, 1840: Our summer here has been rather extraordinary, from the 1st of June to the 1st of this month we had hardly a shower of rain... (Letter, Thomas Bunn to Mrs. Ann Bayley, dated Red River, Aug. 6, 1840, PAM MG2 C19)

- the summer precipitation, while apparently small, was adequate to produce a good crop
September 1, 1840: ...got all our wheat stacked. The harvest has been a very favourable one... (Smithurst Journals, op. cit.)

- the combination of abundant winter snowfall and the late slow melt suggests that runoff would have been in the normal range, despite the apparent dryness of the summer

1840-41**- NORMAL**

- winter conditions began in October and November continued cold with several falls of snow

October 29, 1840: The snow began here the 18 October and it again covered the ground which was frozen; the rivers are taken and we will have a long winter. (Letter, J.N.Provencher, Eveque de Juliopolis, St. Boniface de la Riviere Rouge, to Monseigneur J. Signay, Eveque du Quebec, 20 Octobre 1840, in Lettres de Monseigneur Joseph-Norbert Provencher, Premier Historique de Saint-Boniface, vol. III, 1913, Imprimerie du Manitoba, Saint-Boniface, Man., p. 193)

- these conditions persisted with only occasional mild spells until mid-March

January 23, 1841: It has been a most winterly day...the snow having drifted nearly the height of the fences. (J. Smithhurst's Journals [at Indian Settlement], PAM MG& B2 CMS A96)

February 5, 1841: The weather has now been so excessively severe that people if at all unwell are unable to stir out... (ibid)

February 14, 1841: Track had Got into a drift of snow where my horse stuck fast. (ibid)

March 7, 1841: ...rather longer than usual on the journey owing to the snow being deep and no track yet formed. (ibid)

- thawing began in late March but colder weather in April caused spring to be remarkably late

March 22, 1841: Returned home through half melted snow, in many parts above the horse's knees. (Wm. Cochran's Journals, PAM MG7 B2 CMS A85)

April 11, 1841: Snowing thick, river dangerous, the open places concealed by the new fall of snow...Returned home through deep snow. (ibid)

April 20, 1841: We have every appearance of warm weather the snow has melted very fast to day and the ground is now almost bare. (Smithhurst Journal, op. cit.)

- considerable rain and some snow fell in the last week of April and by May 1, wintery conditions remained

April 28, 1841: It rained nearly all day... (ibid)

April 29, 1841: The wind is now blowing a gale and it has been snowing and drifting all day as if it were the month of Jan. The ground is again quite solid and the snow several inches deep. (ibid)

April 30, 1841: We have now arrived at the end of April without any appearance of winter leaving us. Every thing looks just as it did at Xmas all locked up in solid ice. (ibid)

May 1, 1841: The roads were worse than ever I saw them being for the most part covered with water that was frozen over an inch thick... (ibid)

- breakup of the Red didn't occur until May 6-12

May 6, 1841: ...after a spring which held the ice on our river to May 6. (Letter, J.N.Provencher, Eveque de Juliopolis, St. Boniface de la Riviere Rouge, to Monseigneur I. Bourget, Eveque de Montreal, 13 July 1841, PAM MG7 D1)

May 9, 1841: The ice in the river being unsafe to walk upon and not sufficiently open to pass in a canoe I have been unable to get across. (Smithhurst Journal, op. cit.)

May 11, 1841: ...The ice has to day been floating out of the river in large blocks from two or three feet thick. (ibid)

May 12, 1841: ...The river is now clear of ice and there is an appearance of the weather continuing fine. (ibid)

- warmer weather arrived about May 6; June and July were very hot and stormy with several heavy falls of rain (and some hail)
- August and September were warm with some (but not abundant) rain
- the abundant winter snowfall, precipitation in late April, and late breakup, as well as the significant summer rainfall, all suggest that runoff may have been above-average but within the normal range
- this is supported by Alexander Ross's petition to the Council of Assiniboia in 1842 (see 1841-42, Spring entry)

1841-42

- NORMAL

- freezeup and winter conditions began in late October, 1841, but freezeup wasn't completed until November 16

October 25, 1841: I was detained some time in crossing the river, as it had frozen sharp during the night and I was compelled to wait while the ice was broken to make way for my canoe. (J. Smithhurst's Journals, PAM MG7 B2 CMS A96)

November 1, 1841: Winter has commenced in good earnest to day. The wind has been blowing a gale from the north with a heavy fall of snow. (ibid)

- additional snow fell in late November and December, producing a deep snowpack by early January

January 6, 1842: The snow was so deep and no track I could scarce get on. (ibid)

- cold weather with some further snowfall persisted with virtually no break until late March-early April when a general strong thaw produced a very early spring

March 27, 1842: ...going all the way [to Grand Rapids] by way of the river. There was a good deal of water upon the ice owing to the magnitude of the snow. (ibid)

April 2, 1842: The general thaw seems to have commenced in consequence of which it is not practical to travel by the river... (Journal of Abraham Cowley, PAM MG7 B2 CMS A86)

April 7, 1842: The ice in the river has broken up to day and is consequently impassable... (ibid)

April 10, 1842: The river is now tolerably clear of ice and the Indians were able to cross. (ibid)

- spring runoff seems to have been considerable

Spring: ...in the years 1841 and 1842 the public road, behind my dwelling, was so overflowed from

the swamps behind, during the spring, that it was impossible for man or beast to pass, and was so almost every spring. (Petition by Alexander Ross to Council of Assiniboia, May 27, 1856, quoted in Oliver, E.H. [ed.], 1914. The Canadian North-West, Its Early Development and Legislative Records. Publication of the Canadian Archives No. 9, Government Printing Bureau, Ottawa, p. 421)

- information is scanty after May; southern Minnesota was dry and water levels were reported to be diminishing over several years

August 31, 1842: ...Last year [1841] [the Indians'] corn suffered from drought...They never planted so much corn...as this season; but the cold weather in May...the several frosts between the 10th and 20th June, and the subsequent dry weather, have so entirely destroyed it, that is doubtful whether they will have as much as one sixth, or even one eighth as much as last year...For the last few years the waters in all the prairies northwest of Traverse de Sioux have been rapidly diminishing. Where a few years since, were beautiful lakes several miles in circumference, now, not a drop of water can be found. Even streams dignified with the name of river, in which the Indian was accustomed to paddle his canoe, have entirely disappeared...The muskrat ponds have of course dried up... (Report of the Commissioner of Indian Affairs for 1842, Serial 413, p. 427-431, quoted in Parker, D.D., 1964. Lac Qui Parle: Its Missionaries, Traders and Indians, South Dakota University Press, Brookings, S.D., p. 214-5)

- there is no indication from the few entries available that conditions were this dry in the Red River Settlement or that the crop was affected

1842-43

- NORMAL

- winter set in strongly in early November with severe temperatures and heavy snow
November 11, 1842: ...had the latter part of the journey [home from Grand Rapids]...in a heavy storm of snow. (J. Smithhurst's Journals, PAM MG7 B2 CMS A96)

November 12, 1842: The winter has now commenced in good earnest, the thermometer at Zero [Fahrenheit] and the river frozen over. (ibid)

- from November to March, the winter was severe with many references to "excessive" cold and temperatures of -30E to -50EF

- snowfall was apparently abundant

January 8, 1843: ...the track [was] heavy in consequence of the drifts of snow carried together by the storm of yesterday. (ibid)

February 12, 1843: [attendance was poor] owing partly to the deep snow that has fallen recently... The thermometer being 40E below Zero... (ibid)

February 16, 1843: The thermometer was this morning 52E below Zero. [This] excessive cold...has now lasted nearly three weeks... (ibid)

March 6, 1843: It commenced snowing when we left the Fort and continued the whole day, sometimes drifting to such an extent that we could not see the track. (ibid)

- a snowy winter was also reported in southern Wisconsin

The winter of 1842-43 was one of the severest winters I ever saw. The snow fell first about a foot and a half [deep], and went off mostly and fell again over a foot, and mostly went off again. And in

February [snow] fell again, near two feet, again making in all nearly four feet... (Philander Prescott in Parker, D.M. (ed.), 1966. *The Recollections of Philander Prescott, Frontiersman of the Old Northwest, 1819-1862*. University of Nebraska Press, Lincoln, Neb., p. 173)

- thawing conditions began in early April and the snowmelt was augmented by additional snow and rain; breakup was relatively late

April 7, 1843: The thaw is now going on very rapidly and there being so much water I find it difficult to move about. (Smithhurst Journal, op, cit.)

April 14, 1843: The morning was unfavourable in consequence of a heavy fall of snow mixed with rain... (ibid)

April 23, 1843: The river being full of floating ice is still impassable. (ibid)

April 24, 1843: In the afternoon the weather was so unfavourable owing to a cold north wind and excessive rain... (ibid)

April 29, 1843: It has been snowing all day and the snow drifting with a strong north wind till at times I could scarce see twenty yards from the house... (ibid)

- good weather in early May dried the ground sufficiently to permit agricultural operations to begin but snow fell again in mid-May

- several very heavy rainfalls were reported in June, August, and September (no records exist for July)

June 15, 1843: The rain fell in torrents so that we could not see two yards from the door. (Smithhurst Journal, ibid)

June 25, 1843: ...it rained in torrents for two hours... (ibid)

September 4, 1843: [near White Horse Plain] there came a most awful storm of thunder, lightning and rain with scarce any intermission. The rain came down in torrents...The storm lasted for a full hour... (ibid)

- runoff was probably above-average but in the absence of any reference to the state of the rivers, probably within the normal range

1843-44

- NORMAL

- freezeup occurred in October

October 12, 1843: Scarcely had the weary pilgrims [arrived at Red Lake Mission than there was] such a sudden drop in the temperature that it resulted in the immediate freezing over of the lake... (Schell, Rev. J.P., 1911. *In the Ojibway Country: A Story of Early Missions on the Minnesota Frontier*. Chas. H. Lee, Publishers, Walhalla, North Dakota, p. 17)

October 29, 1843: The ice being now sufficiently strong people cross the river without danger. (J. Smithhurst's Journals [at the Indian Settlement], PAM MG7 B2 CMS A96)

- stormy weather and heavy snow were typical from December to early February

January 1, 1844: The weather exceedingly stormy, and track almost impassable from the large quantity of snow which had fallen. (W. Cochran's Journals, PAM MG7 B2 CMS A85)

January 23, 1844: The storm continued...the drifts are so high that in some places I seem walking between walls of snow that I cannot see over. (Smithhurst Journal, op. cit.)

February 12, 1844: ...in the afternoon a strong gale set in from the north bringing with it a heavy drift of snow. During the five winters that I have spent in this country I certainly never saw any thing to equal this storm... (ibid)

- conditions improved in March and a strong thaw was occurring by early April

April 4, 1844: This and the last two days have been very warm. We have travelled the whole distance from the Pembina River to [White Horse Plain] on foot, in snow and water. (Peter Garrioch Journal 1843-47, PAM MG7 C38, p. 13)

April 6, 1844: It rained the whole morning... (Smithhurst Journal, op. cit.)

April 8, 1844: It has been a fine warm day again...Nearly all the snow is melted. (ibid)

April 12, 1844: The ice has been clearing away to day. The river is passable though there is still a good deal of floating ice. (ibid)

- freshet runoff appears to have been substantial

April 13, 1844: Proceeded to the Riviere Isles des Bois...After going about a quarter of a mile in water of from one to two feet, I came to a creek which took my ox nearly up to the back. I continued about another quarter of a mile through water as before, when I came to another creek, which from its depth and narrowness as well as from the rapidity of its current, I did not like to encounter with my ox and cart...[After getting across] I now hastened to get to dry land and proceeded several hundred yards with that view, tho water up to my knees. At this moment I came in contact with another creek which appeared to be more formidable than any I had crossed...{after crossing} we did not however go more than another hundred yards when he [the ox] again sunk to his belly [near Red River toward Pembina River]. (Garrioch Journal, op. cit., p. 15)

- travelling south from Pembina in June, Garrioch encountered rather high waters in west-bank tributaries of the Red and into Minnesota and reported considerable rain

June 26, 1844: Crossed the Sioux River. The carts in crossing this River were almost entirely submerged. One of Peter Hedin's carts was turned clean over by the force of the stream with a woman and two children in it. (ibid, p. 18)

July 1, 1844: Left Lac qui Parle and crossed the Chippewa River. The water in this River was 8 or 10 feet above low water mark... (ibid, p. 18)

- July, August and September appear to have been normally warm with sufficient rain to produce an excellent crop

- the apparently ample freshet and the high runoff in June suggest that runoff for the year would probably have been above-average but is classified as normal because there is no clear indication that the Red was unusually high

1844-45**- NORMAL**

- freezeup and the first permanent snowcover occurred in October
 - October 18, 1844: the ground is covered with snow and it is very cold. (J. Smithhurst's Journals, PAM MG7 B2 CMS A96)
 - October 28, 1844: The river being sufficiently frozen to admit of crossing... (ibid)
- fall water levels were reported as good on the northern sections of the fur trade route
 - From the favourable State of the Water throughout the lower rivers, the Several ingoing Brigades passed Norway House for Winter quarters at an earlier date than usual. (Letter, Alex Christie to Arch. Barclay, London, dated Fort Garry, Red River Settlement, dated Fort Garry, 31 December, 1844, in HBCA A/11/95 1829-1853)
- no information exists from late-December, 1844, to March, 1845
- several heavy snowfalls were reported in early March and by mid-March a thaw had begun
 - March 7, 1845: A heavy fall of snow, and very stormy. (Peter Garrioch Journal 1843-47, PAM MG2 C38, p. 42)
 - March 11, 1845: Another great fall of snow. (ibid, p. 42)
 - March 16, 1845: Strong north wind and it thaws at a noble rate. Sleet in the evening; snow in abundance before bed time. (ibid, p. 42)
- snow and rain fell in April and cold weather delayed complete breakup until April 23
 - April 3, 1845: It blows and drifts to day like a February day. (ibid, p. 45)
 - April 4, 1845: Wet morning...The track very miry from the heavy rain which had fallen. (W. Cochran's Journal, PAM MG7 B2 CMS A85)
 - April 13, 1845: The ice upon the River being now covered with water which is in some places deep... (J. Smithhurst's Journal [at the Indian Settlement], PAM MG7 B2 CMS A96)
 - April 20, 1845: The ice in the river is at length broken up but has not yet moved to clear out. (Smithhurst Journal, op. cit.)
 - April 23, 1845: At last we have the pleasure of seeing clear water. (ibid)
 - April 25, 1845: It fell about 2 inches of snow the last night and continued to snow all this day. (Garrioch Journal, op. cit., p. 49)
 - April 29, 1845: Has been raining all day... (Smithhurst Journal, op. cit.)
- May appears to have been extremely wet
 - May 1, 1845: Quite stormy and some more rain. (Garrioch Journal, op. cit., p.49)
 - May 11, 1845: The storm which commenced last night at sun set increased in violence towards midnight and the quantity of rain which fell has been so great that every level piece of ground is covered with water and the farm is now half under water... (Smithhurst Journal, op. cit.)

May 12, 1845: Weather wet and stormy. (Garrioch Journal, op. cit., p.49)

May 13, 1845: In the evening it commenced raining and continued till the following morning. (Garrioch Journal, op. cit., p.53)

May 19, 1845: Returned in the evening through heavy rain. (Cochran Journal, op. cit.)

May, 1845: In 1845, the water [in a newly constructed drain] widened the drain and carried off the bridge and fence. (Petition by A. Ross to the Council of Assiniboia, May 27, 1856, quoted in Oliver, E.H., 1914. The Canadian North-West, Its Early Development and Legislative Records. Publications of the Canadian Archives No. 9, Government Printing Bureau, Ottawa, p. 422)

- wet prairies were reported in southern Minnesota in late June

The prairies were very wet and the streams all full, which delayed my arrival at 'Traverse de Sioux' till June 22. (Captain Edwin Sumner, quoted in Parker, D.M., 1964. Lac Qui Parle: Its Missionaries, Traders and Indians. South Dakota State University Press, Brookings, S.D., p. 128)

- little information is available about July and August; it appears to have been hot but not otherwise unusual. Crops were described as average

- the apparently normal freshet and wet May-June period indicate runoff was at least in the normal range, and possibly above-average

1845-46

- NORMAL

- late September, October and early November, 1845, were relatively wet and not cold
November 13, 1845: We are expecting the winter to set in with all its severity daily, it is nearly a month later than in some years... (W. Cochran's Journal, PAM MG7 B2 CMS A85)

- freezeup was rather late, between November 19-22

November 19, 1845: Heavy showers of snow. Large pieces of ice were drifting down the River... (ibid)

November 22, 1845: This evening the river at this place became a sheet of transparent ice. (Peter Garrioch Journal 1843-47, PAM MG2 C38, p. 59)

- snow was reported on several days but apparently not in great quantity

January 5, 1846: There has been very little snow fallen, consequently the tracks up the banks of the River are too slippery for oxen to haul loads. (Cochran Journal, op. cit.)

- very mild weather in late January removed whatever snow had fallen

January 22, 1846. This day has been quite an April one. The wind has been from the south and continues as strong and warm the present moment. (Garrioch Journal, op. cit., p.63)

January 24, 1846: The wind still to the South. This day has been altogether an April one. The wind has dissolved so much of the snow that water begins to stand in pools at the doors and the eaves of barns hang down with length of icicles...It was so wet to day that I was obliged to put on boots in the afternoon. (ibid, p.64)

January 26, 1846: The roads on land were almost entirely bare. (ibid, p.64)

- February seems to have been cold and stormy but mild weather returned in early March, continuing to the end of the month with a heavy snowstorm on March 18-19

March 5, 1846: Got home a little after sun down under a heavy fall of snow. (ibid, p.70)

March 7, 1846: The snow begins to run down into running liquid. (ibid, p.70)

March 11, 1846: A very great part of the road from The Devil's Creek to the R. River was entirely bare. (ibid, p.70)

March 19, 1846: The storm of wind and snow which began last night at sun set has continued without intermission all day. (Smithhurst Journal, op. cit.)

- spring weather returned in April, with considerable precipitation

April 3, 1846: This day the thaw commenced accompanied by much rain. All the roads are deluged with water and scarcely passable. (ibid)

April 5, 1846: The track nearly impassable in many places. The water which had been formed during the warm days of the previous week was frozen over but not sufficiently to carry the weight of the horse. Every two or three steps he would go through the ice and sink above the knees in water & mire. (Cochran Journal, op. cit.)

April 6, 1846: The wind has again got round to his favourite quarter, the Old North. It commenced to snow and drift immediately after breakfast and it continues so to this moment which is bed time. (Garrioch Journal, op. cit., p.73)

April 7, 1846: Today a heavy snow storm. (Cochran Journal, op. cit.)

April 9, 1846: A great part of the road is covered over with ice in consequence of the late rains and subsequent frosts. (Garrioch Journal, op. cit., p.73)

April 17, 1846: Yesterday poured down rain; and this day it snows and drifts like ah that! (ibid, p.74)

- the river broke up between April 21-27

April 21, 1846: About this time the River broke up opposite the Orkney Cottage. (ibid, p.74)

April 26, 1846: ...Church was very thinly attended in consequence of the river having become again impassable. The ice from the Assiniboine River has been floating down to day. This generally passes two or three days after the opening of the Red River. (Smithhurst Journal, op. cit.)

April 27, 1846: The ice has moved away the river is now clear. (ibid)

- May was hot with no rain reported. June, July and August appear to have been normal summer weather but hot, with some heavy falls of rain reported; in August, Thomas Bunn reported

August 8, 1846: Our Winter was much as usual, rather severe, but our Summer has been stormy. Last month particularly, very frequent storms of Thunder & lightning. (Letter, Thomas Bunn, Red River, to Mr. Wm. Bayley, London, in Bayley, D., 1969. A Londoner in Rupert's Land: Thomas Bunn of the Hudson's Bay Company. Moore & Tiller, Chichester, England and Peguis Publishers, Winnipeg, p. 80)

...the crops generally last autumn were exceedingly unproductive, more particularly the wheat and Potatoes, arising principally from the excessive heat in the early part of the summer followed by mill-dews towards the end of July... (Letter, Alex Christie to A. Barclay, London, dated Fort Garry, Red River Settlement, 23 Nov., 1846, HBCA A11/95 1829-1853)

1846-47**- NORMAL**

- the fall of 1846 was mild. Although snow fell on October 18 and ice appeared in the river on October 27, the river did not freeze until November 22

November 22, 1846: Winter has now commenced. Last night the river froze over and is now impassable ice not yet strong enough to bear walking upon. (J. Smithhurst's Journal [at the Indian Settlement], PAM MG7 B2 CMS A96)

- heavy snow fell in early December and very cold weather set in by mid-December

December 1, 1846: It commenced to snow and blow about 12 o'clock the last night and continued all this day the same. (Peter Garrioch Journal 1843-47, PAM MG2 C38, p. 81)

December 6, 1846: Though the weather was severely cold & the ground covered with three feet of snow the Rapids Ch. was exceedingly crowded...The River was not frozen completely so that sometimes horse & sometimes the cariole went through the ice. (Journal of Robert James, PAM MG7 B2 CMS A92)

December 15, 1846: ...the weather is now very cold. (Smithhurst Journal, op. cit.)

- with the exception of a brief milder period late in the month, January was extremely cold

January 20, 1847: The cold daily and steadily increased up to the 20th of January last when the Thermometer indicated the lowest point during the Winter, 47E below zero. (Diary of Colonel J.F.Crofton, Commander of the First Red River Expedition, 1846-7, Winnipeg Public Library, Ca 971.274 c, p. 27)

January 27, 1847: The wind has been south to day, and the weather has been milder than usual. The whole of the present month, with the exception of the last three or four days, has been cold to the Extreme. No year within the remembrance of the oldest settlers has been so cold as this has been. (Garrioch Journal, op. cit., p.83)

- February was mild with considerable snow, and much snow fell in early March

February 1, 1847: The weather was so mild yesterday that the Public road on the river was entirely cut up, by horses running on it as usual, on account of the snow becoming quite soft and nearly thawing. (ibid, p.83)

February 15, 1847: The snow was so deep and the road consequently so bad that the oxen scarcely dragged home one past each. (ibid, p.83)

February 23, 1847: Weather quite mild during our absence but a great deal of snow; and a good deal of thaw. (ibid, p.84)

March 2, 1847: Snow falls in abundance to day, and the wind being high, we had quite a drift day. (ibid, p.85)

March 8, 1847: The storm [which began on the 7th] continued nearly the whole night so that the drifts were so large that I have had several men employed to day in cutting tracks... (Smithhurst Journal, op. cit.)

- although thawing conditions began in early April, the month was generally cold and snowy, till late in the month, with a late breakup

April 5, 1847: The thaw is now commenced and it is not an easy thing to move about. (ibid)

April 11, 1847: The spring here is a most unpleasant season...I had a dreadful ride through... snow & pools of water...(ibid)

April 17, 1847: ...the Winter generally speaking was unusually Severe and so far the Season continues extremely backward for every purpose of Agriculture. (James Journal, op. cit.)

April 18, 1847: The cold weather has returned and we are fearing another fall of snow. It was so cold today...that I could hardly keep my teeth from chattering and the men were all trembling...Strange enough, the birds, which a day or two ago, were going northward, have today been flying southward, not finding the water open on Winnipeg, nor the snow off the swamps where they feed. (Crofton Diary, op. cit., p.21)

April 20, 1847: We have had a heavy fall of snow last night and part of this day; the last struggle I hope of winter..This fall of snow we lament as it will probably extend to Pembina. (ibid, p.23-24)

April 21, 1847: The snow lay this morning half a foot thicker than yesterday, but at 9 the sun burst out, and there has been a rapid thaw all day. The water is now rushing down the river banks and flowing over the ice... (ibid, p.24)

April 23, 1847: The ice on the river has in some places become dangerous, and the thaw has swelled the many small water-courses into impassable torrents. The weather most genial today. (ibid, p.28)

April 25: The Red River broke up last night, the ice having been burst by a strong flood, evidently caused by the melting of the snow to the southward...In the course of this day the Assiniboine gave way... (ibid, p.30)

April 26: The heat today is quite extraordinary. It is summer heat...The ice is flowing fast in very broken masses, down the flooded rivers... (ibid, p.31)

April 27, 1847: The ice has moved away and the river is now clear. (Smithhurst Journal, op. cit.)

April 28, 1847: The south wind and hot sun are melting down the snow and ice rapidly. The prairies are uncovered as far as I can see. (Crofton Diary, p.33)

- May was generally cold and dry (but with snow on May 9-10)

May 10, 1847: The ground is today covered with snow but the first sun-shine will melt it. (ibid, p.42)

May 20, 1847: The weather today is rather milder but cold winds still chill all nature. The large Lakes are still frozen over. (ibid, p.50)

May 21, 1847: The west wind today has brought a warmer temperature...The Colonists are all croaking for rain. This month though called by the Indians the 'Frog Month', has heard no croaking except from the Colonists. (ibid, p.50)

May 23, 1847: It is said by the inhabitants, that the present cold and dry weather is most unusual at this season... (ibid, p.51)

- some rain fell in late May and early June but the river was observed to be low and concerns were being expressed for the crop

June 7, 1847: We have of late been much inconvenienced by the lowness of the river. Neither boats nor canoes can get near solid ground and the people have to land in the mud and where they sink almost up to the knee. (Smithhurst Journal, op. cit.)

June 16, 1847: the dryness has been felt since last year the ground has not had enough moisture to germinate a part of the grain... (Letter, Msg. J.N.Provencher, Eveque de Juliopolis, a Msr. Jean-Charles Prince, Eveque de Martyropolis, dated St. Boniface, 16 Juin, 1847, PAM MG7 D1)

- rain in July averted crop failure but the negative effects of the extreme dryness of the early growing season continued to be stressed by commentators and low water levels were noted by others

August 9, 1847: [The] prospects with respects to the crops have considerably improved since the beginning of the season, where a long continued drought, gave us much reason for apprehending a still more extensive failure than that of last year... (Letter, Alex Christie, Fort Garry, to Archibald Barclay, Hudson's Bay House, London, HBCA A11/95 1829-1853)

August 16, 1847: [The wheat] is not more than a foot high the ears very small...nearly all spring sown wheat has faded owing to the extreme drought of May & June... (Smithhurst Journal, op. cit.)

July 30, 1847: ...The first of the Boats returned from York Factory, on the 22 inst. & by the 26th all have arrived.- The voyage on the whole appears to have been prosperous but the state of the water in the downward trip is described as having been very low & unless it rise very considerably before the end of August, it will we fear be difficult to get up all the supplies required from York... (Letter, Alex Christie, Fort Garry, to Sir George Simpson, Hudson Bay House, Lachine, PAM MG2 B5-2, p.85-86)

August 31, 1847: In 1847, a very dry season, it was possible to proceed with carts in a direct line near the banks of the [Roseau] river from the beginning of the marsh to the post, one mile and a half from Roseau Lake. (Hind, H.Y., 1869. Narrative of the Canadian Red River Exploring Expedition of 1857 and of the Assiniboine and Saskatchewan Exploring Expedition of 1858, vol. 1 [reprinted 1969] Greenwood Press, Publishers, New York, p. 158)

- although the May-June period was clearly very dry, this seasonal drought was balanced by normal freshet conditions when the majority of runoff typically occurs and it is concluded that overall runoff for the year was probably within the normal range.

1847-48

- HIGH

- dry fall, 1847

October 24, 1847: la recolte a donne tres peu...La secheresse a ete sigrande par ici autour qu'il n'a point pousse defoin... (Letter, Msg. J.N.Provencher to Bishop I. Bourget, Bishop of Montreal, dated St. Boniface, 24 October, 1847, PAM MG7 D1)

- many references to intensely cold winter
- heavy winter snowfall

March 12, 1848: I am happy to find that notwithstanding the mountains of drift in which we are entombed, all communications from the outer world is not entirely closed. Such a winter for wind, drift and turbulence...We are looking forward with hope to a more favourable season. The abundance of snow gives promise of lacking moisture. (Letter, John Bunn, Red River, to Donald Ross, Norway House, March 12, 1848, in Healey, W.J., 1923. *Women of Red River*. Women's Canadian Club, Winnipeg, pp. 216-219)

- high spring water levels

April 22, 1848: The water has risen very high in the river several Cattle have been swept away. At one time I saw five oxen going down the stream. The river is walled in by immense masses of ice so that it is difficult to get the Cattle out, four or five have drowned which is a heavy loss to the owners. (Journal of John Smithhurst [at the Indian Settlement], PAM MG7 B2 CMS A97)

- high water on June 1

June 1, 1848: On the fourth day [from St. Paul] Father Belcourt reached Crow Island where he joined two half-breeds on their way to Pembina...The rivers, swollen with a week's rain, were almost impassable. Red Lake River was more than eighteen feet deep at the fording place. In order to cross it they had to improvise a boat from willow branches covered with a tarpaulin in addition to a raft to carry the wagons, carts, harness and saddles. The more precious pieces of luggage were put into the boat and Father Belcourt, charged with rowing it across the swollen river, succeeded in landing on the other side a mile below the starting point. His companions undertook to guide the raft across but it was caught in the swift current and they saved themselves only by abandoning it and swimming ashore...Five more rivers had to be forded and at each one they duplicated the experience of the first. (Reardon, J.M., 1955. *George Anthony Belcourt, Pioneer Church Missionary of the Northwest, 1803-1874*. North Central Publishing Company, St. Paul, Minnesota, pp. 99-100)

- evidence of ice scouring of trees

late June-early July, 1848: Below the mouth of the Red Fork, we...found evidence of the power of the ice on this [Red] river during the winter season. Fifteen, eighteen, and even twenty feet above the level of the river, in July, we observed the trees on the brink of the river, either barked or deeply cut into, and even entirely cut across. (Owen, D.D., 1852. *Report of a Geological Survey of Wisconsin, Iowa, and Minnesota*. Lippincott, Grambo & Co., Philadelphia, Pennsylvania, p. 117)

- very dry summer

July 18, 1848: La chaleur est etouffante depuis longtems. Il n'a pas plu. (Letter, J.N.Provencher, Eveque du Nord-Ouest, St. Boniface de la Riviere Rouge, to Msr. P.-F. Turgeon, Eveque de Sidyme a Quebec, 18 Juillet, 1848, in *Lettres de Monseigneur Joseph-Norbert Provencher, Premier Eveque de Saint-Boniface*, Bulletin de la Societe Historique de Saint-Boniface, Man., v. III, 1913, Imprimerie du Manitoba, Saint-Boniface, Man., p.269)

- very low water levels in August in northwestern Ontario

August 11, 1848: On each side of the river are innumerable small shallow lakes, bearing usually large quantities of rice, but the water in them had sunk so low this season that the Indians were apprehensive of a failure of the crop [Paul Kane on Lake of the Woods]. (Kane, P., *Wanderings of an Artist among the Indians of North America from Canada to Vancouver's Island and Oregon, through the Hudson's Bay Territory and Back Again*. Garvin, J.W. [ed.], 1925. *Master-Works of Canadian Authors*, v. 7, The Radisson Society of Canada, Toronto)

1848-49**- HIGH**

- freezeup and the onset of winter were relatively early (end of October) but November cannot have been severe since the river was still reported dangerous in early December

December 3, 1848: The continued fall of snow for the last days induced me to take the River for the Middle Ch...The snow was deep. The River was full of dangerous holes, being yet but partially frozen... (Letter, John Ballenden, Fort Garry, to A. Barclay, London, dated 29 November, 1848, HBCA A11/95 1829-1853)

- little information exists for the January-April period
- thawing conditions occurred in early April were replaced by colder weather after mid-month and a late spring (PART B)
- a normal freshet runoff is inferred because there is no mention of water levels (PART B)
- very heavy rainfall and flooding in June-August, 1849 (PART B)

1849-50**- VERY HIGH**

- it is assumed that moisture levels in the basin were very high after the wet summer (PART B)

- mild early fall until mid-November

November 16, 1849: The real winter set in with a pretty heavy fall of snow. The long anticipated change as usual came suddenly. Yesterday was genial & lovely-today a boisterous bitter winter. (Robert James' Journal, PAM MG7 B2 CMS A92)

November 18, 1849: ...sufficient snow had fallen to enable the cariole to run. (ibid)

- information is scanty from November, 1849, to April, 1850
- although some thawing occurred in early April, spring was extremely late (PART B)
- exceptional summer flooding occurred in the summer of 1850

1850-51**- HIGH**

- high moisture status of basin after summer flooding of 1850
- the fall of 1850 was mild until mid-November and freezeup did not occur until after November 18

November 14, 1850: The new winter set in after a long season of beautiful weather... (Robert James' Journal, PAM MG7 B2 CMS A92)

November 18, 1850: The ice is drifting down the River in large pieces denoting the intensity of the frost. It will be fast in a few days. (ibid)

- little information about winter, 1850-51
 - thawing conditions began in mid-March and spring arrived very early
- March 16, 1851: A lovely day. The roads almost impassable from the rapid thaw. (ibid)