

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)

March 19, 1851: ...to my surprise I found the Plains with so little snow upon them that after wretched travelling [in the cariole] I did not reach the cottage. (ibid)

March 20, 1851: Had intended to see the Bishop today, but was well-informed of the unsafe state of the River, large openings have appeared in several places. (ibid)

- the remainder of the spring, and the very high water and flooding of the summer are described in PART B

1851-52

- VERY HIGH

- the antecedent conditions and the historic flood of 1852 are described in detail in PART B

1852-53

- NORMAL

- it can be assumed that water storage conditions in the basin were at a maximum at the beginning of the water year due to the extreme flooding of 1852

- fall conditions in 1852 were normal but not severely cold; freezeup of the Assiniboine occurred on November 11, and on November 13 for the Red

November 13, 1852: ...crossing the main river on ice...still no snow although threatening every day. (Diaries of William Cowan, PAM MG2 C15 M154)

- although light snow had fallen on numerous days, the first significant snowfall didn't occur until November 24

November 24, 1852: Mild weather...A considerable quantity of snow fell last night and is still falling this evening. Much required to make better roads. (Winnipeg Journal, HBCA B.235/a/15 1851-54)

- mild conditions persisted into early December, becoming much colder with more snow after the first week

- most of January was very mild with little snow

January 20, 1853: Splendid day, calm and mild. So little snow has yet fallen that the roads are in some places almost impracticable for sleighs. (ibid)

- rain and snow fell at the end of January and early February but total snowfall remained light throughout February

January 31, 1853: Cloudy, wind strong from the south...Some rain fell today. The ground in most places is bare of snow. An unusual thing at this late season. (ibid)

February 2, 1853: ...snow commenced after breakfast has continued nearly all day very light. (Cowan Diaries, op. cit.)

- mild thawing weather in early March removed much of what snow had fallen

- colder weather returned after March 7 with little additional snow; thawing resumed on the

17th, continuing to the end of the month and bringing on an early spring

March 20, 1853: ...thawing for some days during day rode over plains very bare. (ibid)

March 26, 1853: The winter has not been hard there has been little snow, already it has for the most part disappeared. (Letter, Msg. J.N.Provencher, Bishop of the Northwest, to Msg. I. Bourget, Bishop of Montreal, dated St. Boniface, 26 March, 1853, PAM MG7 D1)

March 29, 1853: Wind South & very fine weather the snow is now entirely off the ground. (Fort Pelly Journal Section B, HBCA)

- mild weather continued through April; the rivers began to rise early in the month and continued to rise into May

April 8, 1853: ...The river has been rising rapidly for some days... (Cowan Diaries, op. cit.)

April 12, 1853: ...The ice on the main river and also on the river Assiniboine took a start in the afternoon and drifted rapidly till nine in the evening when it stopped having jammed somewhere below. The water has risen rapidly. (Winnipeg Journal, op. cit.)

April 15, 1853: ...The ice seems to have all left the Red River last night. The ice in the Assiniboine left this evening and is running out fast. (ibid)

- there is some indication of a strong freshet on the Red and lower Assiniboine

April 7, 1853: ...The water mill at Sturgeon Creek has stopped from the back water of the Assiniboine River. (ibid)

May 9, 1853: ...river has been rising steadily since ice broke up now entering root house. (Cowan Diaries, op. cit.)

- in the upper Assiniboine region, spring water levels were low but rose in mid-May after early May snowstorms and rain

April 17, 1853: ...the Swan River is by report still fast, the water will be very very low-unless heavy rains come... (Fort Pelly Journal, op. cit.)

April 19, 1853: ...The Assiniboine River is now completely clear of ice & is very low indeed. (ibid)

May 15, 1853: ...heavy rain all day...a sudden rise in the Swan River... (ibid)

- May was very dry; virtually no rain was reported until late in the month

May 28, 1853: A thunder storm with rain in the afternoon, much wanted for the crops. Winnipeg Journal, op. cit.)

- June appears to have relatively cool and wet, particularly late in the month; from June 17 to June 30, rain was reported in the Winnipeg Journal and Cowan Diaries on 11 of the 14 days

- July and August had normal summer weather, with periodic rain, particularly in late August

- much rain was reported in September by Edwin Hatch at various locations between Pembina and Red Lake in the southern Red River basin and similar reports from Fort Pelly and Red River Settlement indicate the rainfall was widespread

September 16, 1853: This I think was one of the worst nights I ever passed upon the prairie in the summer. It rained until near daylight... The wind blew a perfect hurricane. (Edwin Hatch narrative in Hatch, E.A.C., 1980. Canoes routes through northern Minnesota. The Minnesota Archeologist, v. 39 (4),p. 171-176)

September 18, 1853: Soon commenced raining, and rained all night. (ibid)

September 19, 1853: ...rained all day. (ibid)

- despite the apparently light winter snowfall at the Red River Settlement and the low early spring level of the upper Assiniboine, the spring flow of the Red appeared not abnormal and rainfall was probably above-average in June, late August and September.

1853-54

- NORMAL

- significant snow fell in Winnipeg in October and the rivers were frozen by early in November

November 2, 1853: ...snowing a slight skim on ground much ice floating down rivers. Has been fast in Assiniboine above [?] some days ago and [people] crossing on it. (Diaries of William Cowan, PAM MG2 C15 M154)

November 4, 1853: River frozen & people crossing on foot. (Winnipeg Journal, HBCA B.235/a/15 1851-54)

- November and December were cold with snow on many days but only at Fort Pelly is there indication that it had accumulated to significant depth

January 3, 1854: A very bad day blowing a Gale with snow & drift-the snow is very deep now and will be much against our tripping. (Fort Pelly Journal, HBCA B.159/a/18 1853-54)

- most of January and February were extremely cold and at Fort Pelly, the snow was reported deep

January 18, 1854: ...very cold weather this continued cold weather is making our Cattle very poor. (ibid)

January 27, 1854: ...blowing pretty hard...the snow is too deep for oxen or Horses. (ibid)

February 6, 1854: We have never had such a cold winter as this- The oldest men say so-the thermometer was as low as 55E below zero- 8E below we have ever seen it in R.R. (Letter, William Ross, Red River Settlement, to James Ross, Toronto, PAM RFC 71)

March 6, 1854: Snow to westward very deep [toward Fort Ellice and Swan River]. (Winnipeg Journal, op. cit.)

- milder conditions began in late February, with more snow; heavy snow fell in mid-March with some thawing weather, but the weather remained generally cold with additional snow to the end of March

March 16, 1854: ...storm commenced about 8 o'clock great drifting continued till about 12. could

not see fencing from belfry gate... (Cowan Diaries, op. cit.)

March 26, 1854: Clear and still very cold...the feeling there has not been a colder day this winter-The continuance of this cold weather up to so late a date, will likely give us a very sudden thaw when it begins. (Winnipeg Journal, op. cit.)

- thawing conditions must have begun in the upper Red River basin in late March because the rivers were reported rising

March 30, 1854: ...great deal of overflowing on rivers. (Cowan Diaries, op. cit.)

March 31, 1854: Clear and cold. But, owing no doubt to there having been mild weather in the Upper Country, the water in the river is rising-the roads getting bad: on the river they must soon be impassable. We have now had a steady continuance of winter for five months. (Winnipeg Journal, op. cit.)

- a strong thaw began at the Red River Settlement in early April

April 12, 1854: Excepting the deeper drifts, all the snow now disappeared from the Plains. (ibid)

April 14, 1854: ...a good deal of water is now over the Ice of the Assiniboine River the ground is pretty clear of snow now...(Fort Pelly Journal, op. cit.)

- breakup occurred in mid-April and high water was reported in the upper Assiniboine

April 16, 1854: ...Ice commenced to drive in the Assiniboine River-water high. (ibid)

April 16, 1854: ...ice started in the main river...main river pretty clear...roads said to be bad. (Cowan Diaries, op. cit.)

April 17, 1854: ...Swan River open water very High. (Fort Pelly Journal, op. cit.)

April 17, 1854: ...ice...clearing away on main river now a little on small river. (Cowan Diaries, op. cit.)

April 20, 1854: Wind East and warm sultry weather the water still high in the Assiniboine. (Fort Pelly Journal, op. cit.)

- late April and most of May were cool with heavy rain from May 7-10 but little thereafter until mid-June

- June began warm and dry but frequent rain was reported from mid-June onward at both the Red River Settlement and the upper Assiniboine to continue to be high

June 22, 1854: ...Getting no fish...owing to the River been so high. (ibid)

- frequent rains (often heavy) continued throughout July and August at both locations and the summer appears to have been very wet; between July 1 and August 24, rain was reported at Fort Pelly on 22 of the 55 days

July 11, 1854: the road is very swampy, the late rains having increased its naturally bad state [Hillyer going west from Portage La Prairie]. (Journal of Rev. Charles Hillyer, PAM MG7 B2 CMS A88)

- rain was also reported on about 1/4 of the days in September at the Red River Settlement

1854-55**- NORMAL**

- October, 1854, was mild and relatively dry; freezeup occurred on November 11
November 11, 1854: ...last night the river took tho' yesterday it was open from side to side there was also a heavy fall of snow. (Journal of Abraham Cowley, PAM MG7 B2 CMS A86)
- very little snow fell in November and December
December: There was grief in the Red River Settlement that Fall too. The weather was damp and foggy, with no snow...Arctic winds came in November but still there was no snow. A prairie fire swept over the haylands from Fort Garry to the Stone Fort...But snow didn't even come in December and the last day of the year witnessed another prairie fire. (Knox, Olive, 1958. John Black of Old Kildonan. The Ryerson Press, Toronto, p. 94-95)
- snow fell in two storms in mid-January but little further snow was reported until mid-March
January 11, 1855: ...A heavy snow had fallen [at the Red River Settlement]. (ibid, p. 96)

January 16, 1855: The snow had deepened greatly within a few hours & the journey was heavy. (Cowley Journal, op. cit.)

March 14, 1855: ... the roads heavy from snow. (Diaries of Dr. William Cowan, PAM MG7 C15 M154)
- thawing began at the end of March and continued through to breakup in mid-April
April 18, 1855: ...ice running in main river. (ibid)

April 19, 1855: ...main river clear...ice running in Assiniboine for some time. (ibid)
- no information on water levels was included among numerous observations of the breakup process and it is assumed that they were within the normal range
- May was warm with periodic rain; June, July and August were warm and exceptional rainfall was reported by Donald Gunn
June: Three inches of rain fell on the 17th, one on the 19th and six on the 25th [for a total of 10 inches]. (Donald Gunn's Record at Lower Settlement, quoted in Dawson, S.J., 1859. Report on the Exploration of the Country between Lake Superior and the Red River Settlement, reprinted 1968, Greenwood Press Publishers, N.Y.)

July: ...7th rain 3 3/8 inches, 10th, rain 3/4 inches. Thunderstorm on the 17th, rain 3 inches, 26th, 1 inch rain; 29th, 3 inches rain; 30th, 2 inches; total 14 5/8 inches... (ibid)

August: ...On the 8th, 5 inches of rain fell; 11th, 5 1/4 inches fell, 14th, 2 inches; 27th, 1/4 inch; total 12 1/2 inches. (ibid)

September: ... Total of rain during the month, 6 1/2 inches... (ibid)
- from the Dawson report, then, total precipitation from June to September was 43 5/8 inches. According to the United States Patent Office (1861) precipitation, recorded by Gunn during this period was 39 3/4 inches. Whichever of these measurements is correct, the figures seem unreasonable but as was noted in PART A heavy rainfall was also recorded at Lac qui Parle in southern Minnesota in this summer; even if the total is

discounted due to measurement technique, it seems certain that rainfall during the summer was, at least, above-average

1855-56**- NORMAL**

- October and November appear to have had normal temperatures and precipitation; the river froze on November 12

- late December and early January were extremely cold

January 9, 1856: The winter has hitherto been one of the severest on record-Frozen noses, faces are the order of the day. Thermometer sometimes as low as -50 & 51 and this extreme cold has continued for 5 weeks or so -today is milder... (Letter, Rev. John Black, Red River, to James Ross, Toronto, PAM RFC 158)

- the last half of January and most of February were much milder

- cold and mild weather alternated through March and much of the snow had melted by the end of the month

- April was generally mild with some snow and rain; breakup occurred at a normal time (April 16-20)

April, 1856: ...On the 16th the river began to throw off its winter coat; clear of ice on the 20th... (Donald Gunn's Record at Lower Settlement, quoted in Dawson, S.J., 1859. Report on the Exploration of the Country between Lake Superior and the Red River Settlement, reprinted 1968, Greenwood Press Publishers, N.Y.)

- May was warm with sufficient rain at Fort Pelly to maintain high water in the upper Assiniboine

May 26, 1856: ...no fish from the Barrier owing to the high water. (Fort Pelly Journal, Sect. B (copy) 1855-57 mfm 475)

- Fort Pelly reported frequent rains and high water in the upper Assiniboine in June and runoff in the vicinity of the Red River Settlement seems also to have been high

June 11, 1856: ...Raining all day...I am much afraid this is going to be a wet Summer. (ibid)

June 12, 1856: ...The Rivers are very high owing to this continual Rain. (ibid)

June 30, 1856: ...the unusual quantity of water which poured into every stream [last year, 1856] caused serious injury to many of the bridges... (Minutes of the Council of Assiniboia, June 25, 1857, 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. 423)

- very little rain was reported at Fort Pelly in July but apparently more fell at the Red River Settlement

August 7, 1856: We have had very heavy rains lately and exceedingly hot weather. The heat was almost insufferable for some days. (Letter, Henrietta Black, Kildonan Manse, to James Ross, Toronto, PAM RFC 189)

The month of July...was extremely wet. Our hay ground in the parks, and everywhere else, was

drowned. The month of Augt. has been dry... (Letter, Henrietta Black, Kildonan Manse, to James Ross, Toronto, PAM RFC 189)

- Fort Pelly reported rain on 1/3 of the days in September

1856-57

- HIGH

- fall and winter conditions in 1856-57 leading to heavy late winter snowpack are described in PART B
- spring was remarkably late, with river breakup not occurring until after May 9 (PART B)
- spring water levels were very high with apparent flooding, at Pembina at least, and high water levels persisted into the summer (PART B)

1857-58

- LOW

- the fall of 1857 was relatively mild and dry until November 7 when 4 inches of snow fell; the Red River froze over on November 9 but few very cold days and little snow were reported by Dawson by the end of January (Dawson, S.J., 1859. Report on the Exploration of the Country between Lake Superior and the Red River Settlement, reprinted 1968, Greenwood Press Publishers, N.Y.)
- February was colder but still with no major snowfalls
- mild temperatures prevailed in the last week of February and throughout March, and spring began early

March 23, 1858: The season is particularly mild & the general thaw seems to have commenced. The ice is strong but there is much water along the shore & it is unpleasant getting on it. (Journal of Abraham Cowley, PAM MG7 B2 CMS A86)

March 28, 1858: [The small congregation] is of course owing to the state of the River partly covered with the winter ice & partly open... (ibid)

March, 1858: The winter was mild throughout, except about the middle of February, when...the thermometer indicated -37E Fah., but only on one occasion. The greatest average depth of snow did not exceed one foot, while in the wooded region, to the eastward near Lake of the Woods, it might be about 1 foot 4 inches. (Dawson, op. cit.)

March 31, 1858: The spring has set in earlier than usual. The snow is mostly gone- the creeks are all running and the ice on the River has started here today-what it was never known to do in March before-Last year it was the 2nd of May, '56 16th April. (Letter, Rev. John Black, Frog Plain, to James Ross, Toronto, PAM RFC 228)

April 1, 1868: Robert Tate [and]...William Slater...had started from Red River on the 11th of March and accomplished their journey during the severest time of the whole year. In the first place the snow had melted off unusually early, they had to throw away their snow shoes and walk through half-frozen slush from morning till night; the ice had broken up on the river shortly afterwards, and they had to wade many of them. (Spry, I.M., 1968. The Papers of the Palliser Expedition, 1857-1860. The Champlain Society, Toronto, p. 169)

- apart from two snowstorms on April 5 and 17, very little precipitation was reported and as early as April 8, the river was falling
- snow fell in mid-May and showery rain was reported on several days in late May
- from June through August, rain (with intensities varying from light to continuous or heavy) was reported in Winnipeg with regularity; various journals in the Settlement indicate rain on 30 of the 101 days from May 18 to August 26 and on 4 of the first 6 days of September; at Fort Ellice in Saskatchewan, rain was reported in 21 days in June and July.
- this apparently adequate rainfall over a broad region either was unrepresentative of conditions to the south and east, or was not sufficient to overcome the light winter snowfall since low water was widely reported throughout the summer

May, 1858: As the water was very low at the time we passed along, it was confined to a channel from two to four chains in width for a distance of 6 miles meandering through a valley which in times of high water is covered... (Dickinson, in Dawson, op. cit.)

June 1, 1858: ...in consequence of the very low state of the water this year, numerous small rapids were formed in rivers connecting Gun Flint Lake with Lake Seiganagah. In ordinary seasons these rapids are passed without difficulty, but this year they involved the portage of a portion of the baggage and the letting of the canoes down them by rope...Our guide preferred going by Loon's Narrows, fearing that the always dangerous Namenkam Rapids would be almost impassable for heavily laden canoes on account of the low stage of the water. (Hind, in Dawson, op. cit.)

August, 1858: The waters on the rivers and lakes on the east side of the height of Land, the Lake Superior water-shed, were high in 1858, while those on the west side, or the tributaries to Lake Winnipeg were unprecedently low. In many of the lakes recent water marks, four and five feet above the present level, were frequently observed, The remarkable lowness of the water was attributed by the half-breeds and Indians to the very small quantity of snow which fell on the western slope during the last winter. (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, N.Y., p. 75-76)

October, 1858: This part of the country [Pembina Mountain] is quite destitute of water; there are no creeks, and the ponds which are said to be generally full of water were now quite dry... (Hind, in Dawson, op. cit.)

1858-59

- HIGH

- the fall of 1858 seems to have been normal in terms of temperature and precipitation; the freezeup date of November 12 was not unusual

November 12, 1858: Red River crossed on foot. (Winnipeg Journal, HBCA B.235/a/16 1858-60)

- cold weather began in early November and remained very cold until mid-January, with snow reported on 16 days (about 1 in 4)
- from mid-January to the end of February, severe cold weather alternated with mild, and periodic snow fell
- March was generally very mild, on occasion thawing, from early in the month until cold weather returned on the 24th, lasting until April 10; heavy snow was reported in two storms
- spring was very late

April, 1859: ...16th...a clear day drifting all day-- and plenty of snow in the woods and very winter like...no water to be seen standing on the ice yet I walked on the ice on the river from the stone fort to Mr. D. Gunn's, on ... 19th April...the next day no water to be seen on the river...and quite winterlike and cold...[24th] not thawing much; plenty of snow still, no water on the ice in the river yet...[26th] a great quantity of snow thawed away...27th...the river covered with water---no water had been seen the day before on the ice... (Diaries of Samuel Taylor at Red River Settlement, PAM MG2 C13)

- breakup did not occur until May

...people walked on the ice from G. Kiplins to Thomas Fiddlers on ...2nd May, and it all broke there a.m. 3rd May very fine warm weather came all at once and the ground dried up in 3 or 4 days... (ibid)

- the Red River continued rising from breakup until May 16

May 14, 1859: ...the River continues rising. (Winnipeg Journal, HBCA B.235/a/16 1858/60)

May 16, 1859: ...the River has fallen a very little (ibid)

- very high waters and severe flooding were reported throughout Minnesota and the upper Mississippi basin by the Earl of Southesk travelling from St. Paul to Red River; several of the streams he mentions are tributaries of the Red

May 12, 1859: The whole country [along the upper Mississippi] is now much flooded, the water being higher than has been known since (I think) 1826. Sir George [Simpson] doubts if we shall be able to get on beyond St. Paul,-it will be a wet ride at all events. The Mississippi was in high flood, submerging most of the willows that grow on its banks... (The Earl of Southesk, 1875. Saskatchewan and the Rocky Mountains. James Campbell and Sons, Toronto, p.7)

May 14, 1859: [Mr. James McKay from Red River] was reassuring: he had found the country everywhere passable, the roads in good order, and the swamps tolerably free from water, though the rivers were unusually swollen [Southesk at St. Paul]. (ibid, p. 8)

May 20, 1859: M'Kay decided to halt ...[at] an excellent camping place...near which flowed with calm but powerful sweep the broad and swollen stream of the Crow-wing River. (ibid, p. 15)

May 25, 1859: ...[We rode twenty miles]...only stopping when we reached the flooded stream of the Rice River...Every brook was a river, every swamp a lake, the road a swamp. (ibid, p. 22-23)

May 26, 1859: This deep wide stream [Red Lake River] rolled on in a heavy flood a few yards below the willows that sheltered our tents, and as I watched its swift and turbid current, I could not but wish that everything were safe across. (ibid, p.24)

May 31, 1859: ...the only incident of the day was the passage of the Vieux Marais, a horribly swampy creek, which from its depth offered a serious obstacle, although only a few yards wide...I was quite...well placed on Toma's powerful back, though even he had enough to do in wading this deep and treacherous morass. (ibid, p. 28)

- rain was reported on four days in the first week of June

June 1, 1859: We had a heavy rain and thunder at night...It cleared up for a few minutes between 4 and 5 A.M., so we set out on our march; rain however, came on again, and lasted nearly four hours [nearing Fort Garry]. (ibid, p.29)

- heavy rain was reported in the Winnipeg Journal on six days in July, little rain was reported in August, and several heavy rainstorms occurred in September

- although the Red isn't mentioned specifically after the freshet, it is apparent from the Earl of Southesk's account of high waters in tributaries such as Red Lake River that it would have felt the effects of the high runoff in Minnesota. This, combined with the late breakup and heavy late-winter snowpack, would probably have produced a high runoff in the Red, although clearly not of a threatening nature.

1859-60**- NORMAL**

- October, 1859, was generally described in the Winnipeg Journal as cold with little snow; freezeup was relatively early

November 4, 1859: The river was frozen over on the night of the 4th of November (Winnipeg Journal, HBCA B.235/a/16 1858/60)

November 6, 1859: ...the ice took in the Assiniboine & the main River is also frozen across at the Point. (ibid)

- milder weather with considerable snow followed after the first week of November but turned very cold in the last week, generally continuing until mid-January when it again became unusually mild until the end of the month

- severe cold returned at the end of January but in February the weather alternated between very cold and very mild, with snow reported on six days

January 31, 1860: ...while camping near Snake River [south of Pembina], we heard trees cracking repeatedly from the intensity of the frost...The reports were loud and sharp, I was informed, actually splitting into visible rents and fissures. (The Earl of Southesk, 1875. Saskatchewan and The Rocky Mountains. James Campbell and Son, Toronto, p.367)

February 14, 1860: The winter, of which the longest and most severe portion has now passed, has been remarkable for its changeableness of temperature... (Nor'Wester Newspaper, Feb. 14, 1860)

- spring began early with strong thaw, rapid snowmelt and rising river levels by mid-March
March 15, 1860: Thawing very much wind S. (Winnipeg Journal, op. cit.)

March 18, 1860: Wind S & NW the ground bare of snow everywhere & the water rising in the River. (ibid)

- low April water conditions in the Red are described in PART B

- wet summer and high water in the southern Red River basin (PART B)

- water levels were clearly low during the freshet but appear to have been reasonably high for a long period from June onward, sufficiently so that the steamboat was able to make a final trip on August 30, which was not always possible even in normal years

1860-61**- VERY HIGH**

- this water year included the third highest historic flood (PART B)

1861-62**- LOW**

- although water levels were described as low at the end of September, 1861, they must have been actually quite favourable since the steamboat was expected to be able to make a final trip at this unusually late date

October 1, 1861: It is expected that the boat will be able to make another trip before being laid up for the year. We are agreeably surprised to find she has made so many. The water is now very low and yet she runs! (Nor'Wester Newspaper, October 1, 1861)

November 11, 1861: That the season was reasonably satisfactory is shown by an item in the St. Cloud Democrat of December 5th, 1861, which stated that Mr. E.R.Abell, engineer of the Pioneer...reported that the boat had been laid up about 30 miles below Fort Garry on November 1st, and that there had been a good stage of water during the entire season. (Bill, F.A., 1847. Life on the Red River of the North, 1857 to 1887. Wirth Brothers, Baltimore, Md., p. 57)

- October was mild without much rain

October 31, 1861: ...this is the finest fall that any person remembers. (Diaries of Samuel Taylor at Red River Settlement, PAM MG2 C13)

- the river froze on November 11 but November and December remained unusually mild with little snow

November, 1861: ...the River set fast on...11th...17th a fine day very little snow yet...[15th] they found all the swamps in the woods full of water... (ibid)

December 24, 1861: The winter thus far has been remarkably fine. (Nor'Wester)

December, 1861: ...11th fine weather all this time and very little snow yet...[20th] There has been hardly any snow since about the 20th of the last month; some people have not gone off to fish yet for want of snow... (Taylor Diaries, op. cit.)

- winter arrived with severity at the beginning of January and continued cold (with brief mild periods) through February

- snowfall appears to have been light at the Red River Settlement, somewhat heavier at Fort Pelly; strong thawing began in mid-March

March, 1862: ...6th was the first mild soft day we had yet this winter...15th pretty soft, and water about the doors...23rd a fine warm day some parts [of] the roads are getting bad now, and the fields are getting bare...24th it was snowing thick a.m. and blowing hard but after dinner it fell a small rain...29th the snow is melting now...fast... (ibid)

April 2, 1862: Spring is opening upon us in right earnest. The weather is delightfully genial. The snow is off the ice for the most part, and the creeks are beginning to run. Carolling by land is at an end, and will soon cease upon the ice, too. (Nor'Wester, op.cit.)

- April turned colder with snow, and breakup was quite late

April, 1862: ...4th snowing thick as we came home the snow was deep out there then...15th the snows soft in the woods now...it began to snow thick...18th...the River is still very strong yet, and people still driving up and down the same as winter...I walked across the river on a horse on [the] 28th...29th...the River began to break up opposite the school and downwards...30th the water rose over Thomas Fidler's bank when the River broke, but it soon fell, fine dry weather about this time and farming everywhere. (Taylor Diaries, op. cit.)

May 2, 1862: The ice is now leaving the river here. (Journal of Abraham Cowley, PAM MG7 B2 CMS A87)

- from late April through the entire summer, although rain did occur, drought was the major concern expressed

May, 1862: ...11th very hot the ground is now very dry but today...some fine showers of rain...25th very warm thunder and a little rain after dinnertime, rain now is much needed...29th hardly any rain to be seen now the weather is dry and warm now. (Taylor Diaries, op. cit.)

June, 1862: ...19th...it is remarkably dry ever since the river opened and hot, hot... (ibid)

July 9, 1862: ...the crop will not be a heavy one. This is owing to want of rain in the early stages of growth. Within the last month, there has been quite enough, but the month before when it was so much required there was not a single shower...(Nor'Wester, op.cit.)

- by late July, the water level in the Red was too low for steamboat travel

July 23, 1862: ...the low water kept her [the International] two days and a half at Goose Rapids...On the last trip, they came over the rapids with 8 inches less water than Capt. Bryant had last August when he was stuck fast for four days. (ibid)

September 11, 1862: We cannot be far astray...in supposing that [the steamboat] must be detained by the lowness of the river...(ibid)

- from the accounts of Samuel Taylor and The Nor'Wester, rain fell more frequently in June, July and August than these extracts would suggest; the dryness of the summer, however, is clear and this combined with the light late-winter snowpack would suggest that runoff would have been low for the water year

1862-63**- LOW**

- October, 1862, was cold with an early freezeup and heavy snow on the 23rd
October, 1862: Of late, the weather has become quite cold. The river froze over on the 18th October but afterwards broke up and again set fast on the 31st. Snow first fell on the 23rd October, and that fall had almost disappeared when a second fall on the 30th seems to have ushered in a permanent coating. (Nor'Wester Newspaper)

- much of this snowcover was removed by warm weather in mid-November and mild weather continued through December and January with little snow in December and some in the latter half of January
December, 1862: 2nd very little snow yet...19th...hardly any snow had hauled...28th a fine mild dark day still little snow...30th...clear weather every day now and warm. (Diaries of Samuel Taylor at Red River Settlement, PAM MG2 C13)

January, 1863: ...16th snowing from south...17th a mild snowey day...20th a mild day...22nd clear and warm...25th a clear mild day. (ibid)

- February began very cold but became mild by mid-month and snowfall must have been somewhat greater since on the 15th, Taylor commented "the snow is pretty deep now."
- with brief exceptions, March was mild throughout, continuing into April
March, 1863: ...1st a clear pretty warm calm day...7th a snowey mild day...15th very soft...16th a mild day...[19th] warm weather...roads bad...29th blowing strongly from south (ibid)

April 13, 1863: Spring has fairly set in.. The weather has been very fine and mild. The snow has almost entirely disappeared...The very limited quantity of snow that fell during the past winter has had something to do with this as well as with the moderate flow of our creeks and rivulets. The ice will probably break up in the course of the present week. (Nor'Wester, op.cit.)

- breakup occurred on April 15-17; little precipitation was reported for the month and concerns were expressed about the lowness of the river
April 27, 1863: Our readers will recollect what trouble the International had last summer [1862] with the low water. It is to be feared there will be still greater embarrassment this year for the river is extremely low just now...On Wednesday the 15th instant, the river-ice broke up and began to drift down current. On the 18th and 19th we had very bad weather- snow and sleet with a heavy north-easterly wind...It is feared that the season will be a very dry one. The river has been unusually low for the season and the creeks are almost dry. (ibid)

- May was warm and very dry
- although some rain was reported at the end of May and 1st of June, dry hot weather continued through June and July, and the water level of the Red was too low for the steamboat
June 2, 1863: At length we have had rain. Since last Thursday there have been several refreshing showers...Having had over five weeks of dry weather, this rain is much needed. (ibid)

June, 1863: 1st was a fine rainy day the ground is still dry...30th dry, the weather was never seen people says so long without rain, it thunders often and yet no rain, sometimes it is very hot, it gets very rainy like sometimes but it clears off and there is no rain. (Taylor Diaries, op. cit.)

June 30, 1863: Add to [the Indian troubles] the troubles of extreme low water and the last of June found the International "safely" moored [at] ...Abercrombie. (Bill, F.A., 1847. Life on the Red River of the North, 1857 to 1887. Wirth Brothers, Baltimore, Maryland, p. 63)

July 8, 1863: The want of rain is becoming a serious matter with farmers. The season thus far has been a very dry one and cereal crops look parched. On Saturday last the thermometer registered 101E in the shade. (Nor'Wester, op.cit.)

July, 1863: 1st...this is the driest summer that any one can remember...17th...low water in the river. (Taylor Diaries, op. cit.)

- some rain fell in August but the month was also generally dry; more regular rain fell in September but low waters continued

September, 1863: ...[boats from Norway House] came up the river upon the 7th, they could not proceed for want of water...[after the 19th] the Watermills are all dry and will not be able to grind this fall...(ibid)

1863-64

- VERY LOW

- October, 1863 was cold and snowy with an early freezeup

October, 1863: A great fall of snow a.m....3rd-- and snow again a.m. 4th...18th it was wet snow falling all day...19th soft wet snow falling...20th a wild snowey day...the River frozen over a.m. 22nd...24th plenty snow now...25th plenty snow on the ground...Stevens and myself went across the River through a track cut through the ice opposite...Fidler's. (Diaries of Samuel Taylor at Red River Settlement, PAM MG2 C13)

- November and early December were milder and some of the snowpack was removed
- from mid-December to March, cold and mild periods alternated and in late February, thawing conditions began

February, 1864: ...22nd clear and verry warm snow melting fast...24th a rainy fore part of the day and a wet snow from East in the evening...25th a real soft day... (ibid)

March 5, 1864: The snow is disappearing and we expect an early spring. (Journal of Abraham Cowley, PAM MG7 B2 CMS A87)

March, 1864: ...25th there is very little snow wasted here yet the roads down here are as good as any time in the winter, but up this settlement the snow is almost done... (Taylor Diary, op. cit.)

- thawing proceeded more gradually in April and river breakup didn't occur until late April

April 12, 1864: The transforming process has been an unusually gradual one this year. We have had fine warm, sunny days and then again the icy breath of winter has chilled us by a cold, north wind...Here and there the cattle feed on small patches of the prairie where the snow has melted off. At the Long Lake, we believe, the cattle have been at large on the plains for weeks past... (Nor' Wester Newspaper)

April 26, 1864: Early this week the ice commenced to break up and float lakewards in a compact body, which in a few days became broken up into innumerable fragments. The river is higher than anticipated though the rise of water has not been so sudden or so great as in previous seasons... (ibid)

- low water was reported in the upper Assiniboine region

April 27, 1864: ...from the shoal state of the water in the Swan River no pieces can be taken in boats all the way to the Store... (Fort Ellice Journal, HBCA B.63/a/7 1863/64)

- cool dry weather and low water were reported in May and although some rain was reported in June, dry weather caused concern for the crops and water levels; extreme drought persisted for most of the summer

May, 1864: ...this spring the Watermills cannot grind for want of water...20th; a hot day, the weather is dry dry now, verry rare to find any water in any swamp now, this is so far gone of the third- dry summer...The steam boat made one trip about two weeks ago--but she will not run more for want of water if no rains come... (Taylor Diaries, op. cit.)

June 21, 1864: The crops. Where are they? Burning, drying, withering in the ground! ten days more of this increasing 'Drought' and the question is dismally put at rest. We shall have none... Since the above was in type, we were thankfull to say, a fine rain has fallen over the Settlement. (Nor' Wester Newspaper)

July 23, 1864: All through the Sauk Valley and Northern Minnesota generally, the season has been unusually dry... (ibid)

August 18, 1864: The oldest inhabitant does not remember a summer of such extraordinary long-continued heat as we have experienced this year in Assiniboia...That this is the case will readily be believed when we say that the thermometers have indicated from 87 to 90, 97, and even 100 degrees in the shade! Within the past 40 or 50 years, such a summer of heat and wind has never been known in Rupert's land. When the sky became overcast with clouds, in most cases the grateful rain was carried beyond us by high winds and the land remained parched...Despite some smart showers in June and July, there is barely enough herbage on the plains to feed the cattle. (ibid)

August, 1864: The heat of the summer of 1864 at Red River was so extreme that nobody in the settlement remembered such another. The thermometer sometimes continued for a considerable portion of the afternoon to stand at 100 degrees in the shade. The river sank and the International made only one trip...The droughts prevailed until the middle of July, when rain for the first time visited the parched ground. With it, unfortunately, arrived swarms of locusts... (Hargrave, J.J., 1871. Red River. Reprinted 1977, Friesen Printers, Altona, Manitoba.)

1864-65**- NORMAL**

- October, 1864, was mild and relatively dry but cold weather began in early November
November 2, 1864: It is the commencement of November, but we are yet experiencing our Fall season. ...The days are sunny and gloomy by turns-the latter being decidedly the preponderance, and there being every appearance of a good downfall of rain or snow, which, however, does not come in any considerable quantity...Last year winter had unmistakably commenced ere this. (Nor' Wester Newspaper)

November 12, 1864: The River is now frozen over- on the 8th there was ice upon the water-on the 9th we had to break our way through it-but on the 10th we all walked over the river on ice. (Journal of Abraham Cowley, PAM MG7 B2 CMS A87)

- 5-6 inches of snow fell in mid-November but mild weather and rain removed it by the end of the month

November 28, 1864: We had such mild weather towards the close of last week that the snow has all but disappeared off the roads and sleighing is abandoned. There was a heavy fall of rain yesterday evening which, followed by the hard frost of last night has sheathed the roads in ice. (Nor' Wester Newspaper)

- December and early January were generally cold and dry, with milder weather and considerable snow after January 7 until the end of February

January, 1865: [7th] pretty mild day...[13th and 14th] fine weather... 22nd...rather cold north wind the snow is pretty deep in the woods now...30th was a pretty warm day. (Diaries of Samuel Taylor at Red River Settlement, PAM MG2 C13)

February, 1865: 2nd a mild soft rather rainy day...20th...snowing thick... (ibid)

- March was cold with much snow until the 14th when thawing began and continued to the end of the month

March, 1865: 1st a snowey day and drifting...2nd Snowing and drifting all day...11th...there was a lot of snow fell a.m....the first little mild weather we have had began on the 14th...17th and 18th mild weather now...25th a soft day roads bad, there was a fall of snow in the night...27th was a wet snow falling thick...29th the snow was all off in some places, and in some places it was deep... (ibid)

- mild and colder weather alternated through April, delaying complete breakup until after the 22nd; considerable rain fell early in the month and very heavy snow fell on the 6th

April, 1865: ...it began to rain about 11 o'clock a.m. on the 3rd and rained heavy all night and next day... 6th the worst day we had the whole winter for snow and drift, and a regular storm of wind...sometimes I could not see the woods at each side of the Road...the ice began to break at the Stone fort on ...the 22nd...the 23rd down below Mr. Bunn's house at Victoria Cottage... (ibid)

April 17, 1865: The snow storm on the 6th is believed to have been the most severe occurring here for 20 years. There was a perfect hurricane for twenty-four hours, and the snow flew in clouds, so that it was impossible to see twenty yards in any direction out-doors. Both before and since this storm, the weather has been mild and spring-like. (Nor' Wester Newspaper)

- in contrast to the 3 previous years, the freshet appears to have been strong
 - April 17, 1865: The mail carrier states that a freshet had occurred at Pembina the water rising four feet so suddenly that the people there could not save their fishing nets. Considerable freshets has also occurred along the Mississippi, sweeping away the telegraph poles and wire at some points and doing other damage. (ibid)
 - May 13, 1865: Plenty of water is reported [by the steamboat company] all along [the Red River]-there being on the most dangerous bar (the Goose Rapids) some eight feet of it. (ibid)
- May was hot and dry but heavy rain fell throughout June
 - June 8, 1865: Vegetation never looked better than it has since the heavy late rains...(ibid)
 - June, 1865: 1st it began to rain after dinner, but in the evening it began to Thunder and there was the heaviest fall of rain that has been for three or four years back...16th a warm rainy day...18th showers now and then...there was a great deal of rain this week...24th a rainy day...25th a dark cloudy rainy like day the ground wet... (Taylor Diary, op. cit.)
- July and August appear to have been dry since little is reported in the Taylor Diaries for these months
- considerable rain fell at Fort Ellice in the first part of September, causing a rise in the Qu'Appelle River
 - September 16, 1865: ...[The river] is very high owing to the late heavy rains. (Fort Ellice Journal, HBCA B.63/a/9 1865/67)
 - September 17, 1865: ...The River still rising. (ibid)

1865-66**- NORMAL**

- cold weather set in late in October, 1865, and froze the river but milder weather removed it by mid-November and it did not refreeze again until late November
 - October, 1865: ...some parts of the river frozen over the night of the 26th but opened in the daytime...29th...all the River is covered over with ice down here this two or three days back...31st--the fishermen cannot get into the river for ice, it is now strong, the weather is cold now... (Diaries of Samuel Taylor at Red River Settlement, PAM MG2 C13)
 - November, 1865: ...6th and all the week has been what we might call the Indian summer...[11th and 12th] the ice broke up and the River cleared out there was not one particle to be seen...[15th-18th] fine weather not cold, south wind the ground was thawed and soft as it was in summer...19th raining...20th it cleared up and was warm and the whole week has been clear and warm...2nd there is not a spoonful of snow yet...on the morning of the 28th there was nearly three inches of snow on the ground the River was nearly all fast a.m. 28th but some men did come over with a skiff, from the other side every morning until the 30th a.m. (Taylor Diaries, op.cit.)
- December and January weather appears to have been normal but not severely cold
- total snowfall remained light until February
 - February, 1866: ...3rd a verry cold day...a good road, the snow is not deep at all yet...6th and 7th rather cold; a great fall of snow on the 8th...[16th] there is now a good quantity of snow on the ground...the last days of the month melted the snow away verry much. (ibid)

- more snow fell in March and the snow cover was reported deep

March, 1866: 1st...it began to snow before bedtime, and it snowed and drifted most of three days, the snow is deep now...15th ...the weather is still keeping cold the snow is deep...[24th] the weather is still cold, we have had no warm days yet...25th...not very cold, snow deep deep now...27th the Weather began to be a little warm, and the following days there was some water on the Public Road... (ibid)

- thawing began slowly in April but became stronger by mid-month; breakup did not occur until early May

April, 1866: 3rd...the weather is still cold not thawing much yet...6th...the snow is deep in the woods...13th and also the 14th began to thaw the snow pretty fast...17th rain most part of the day making plenty water pretty warm weather...20th a great fall of wet snow...21st...plenty water on the roads...some of the ice began to break at the Fort a little only on...28th... (ibid)

May, 1866: 1st a fine farming day there was about one quarter of a mile of open water from a little above the fort gate down to below J. Clouston's water mill upon the 2nd p.m. then the ice all cleared out on the 3rd it cleared out at lower sugar point on...4th... (ibid)

- high water was reported in the Qu'Appelle River

April 23, 1866: The river all most clear of ice. Mr. Watt...arrived at the Qu'Appelle river but was [?] on account of the highth of the River. (Fort Ellice Journal, HBCA B.63/a/9 1865/67)

May 17, 1866: ...they left [3 carts] on the other side of the Qu'Appelle the water being too high to get them across. (ibid)

- June was wet in the Red River Settlement and much rain and snow fell at Fort Ellice

June, 1866: ...2nd there was thunder but little or no rain, we need rain much now...4th heavy rain...heavy rain 5th rain and thunder on the 6th and 7th...9 a.m. the ground covered over with snow, and snowing thick now and again during the day, and a cold north wind all day...20th p.m. terrible thunder and bright lightning and heavy rain...p.m. the 23rd some big hail fell amongst the rain... (Taylor Diaries, op. cit.)

June, 1866: [8th] Singular weather for the time of year. Raining hard all morning which turned to Snow about noon & continued till the present time. Very cold wind from North...Snowed all after noon...[9th] Snowed all night and till About 8 A.M. this morning...[10th] Raining torrents all day...[11th] We have had very rainy weather of late...[16] Almost the first fine day during the present month...[23rd] Heavy rain...[25th]...the frequent rains rendering the roads impassable for heavily loaded vehicles. (Fort Ellice Journal, op. cit.)

- little rain was reported by Taylor in July but August and September seem to have had normal amounts

1866-67**- NORMAL**

- the latter half of October was cold and the rivers were frozen by the end of the month
October, 1866: ...27th...the boys are skating on the little lake below our house some days ago;-- a great fall of snow on the morning of the 29th...[30th] cold in the morning and the ground covered with snow all the river frozen over a.m. (Diaries of Samuel Taylor at Red River Settlement, PAM MG2 C13)

- milder weather and rain opened the river again and it didn't refreeze until November 18
November, 1866: 1st a calm snowey day rather cold...The River set fast enough on the first...4th plenty of people came to church from the other side of the river by walking and the ice was strong...7th was calm and warm...the ice all broke up and cleared out on the 7th--there was a good deal of rain on the 7th...there was a great fall of snow after breakfast the 8th and the ground very wet...the 10th the ground was frozen pretty hard...ice floating here and there in the River 11th...12th a fine day river open...18th...the River is all fast now again but weak... (ibid)

- December was quite mild with abundant snow and rain and continuously cold weather didn't begin until mid-January
December, 1866: 1st a pretty day hardly any snow...2nd...rain at dinnertime...[5th] a really warm day snow wet indeed most of the ground is bare, people cannot haul yet...11th was clear and cold, there is so little snow yet that the roads are slippery...17th pretty mild and snowing...[18th] a course snowy day...20th snowing thick...there was a heavy rain a.m. the 22nd and then after breakfast it snowed thick...several people heard thunder on the 22nd before it began to rain hard... (ibid)

- February alternated between cold and mild with "a good deal of snow" on the 22nd (Taylor Diary, op. cit.)

- little snow was reported in March, which had generally cold temperatures until the last week when thawing began. April was sufficiently cool to delay breakup until late in the month
March, 1867: 1st a cold snowey day...4th cold a.m. indeed the whole week was cold...24th...we have had no warm weather yet...25th a pretty day the weather a little soft...28th a fine soft day warm... (ibid)

April, 1867: ...12th the snow is nearly all off now the ice in the River is getting bad now...23rd snowing...there was a piece of open water opposite John Clouston's Mill since the 19th the ice began to move down p.m. 26th a little, but, the 27th it cleared down to the point at Mr. Murray's a cold day... (ibid)

- early May was cool and wet, becoming warm after the first week
May, 1867: ...Rain and snow 3rd snow the 4th...the ground was covered with snow a.m. 5th. We have not been ploughing yet, the ground is wet 13th then we had a fine shower of rain...14th rain the whole day... (ibid)

- little information exists for the summer; Traill at Fort Qu'Appelle reported an apparently significant flood (PART B) but there is no independent confirmation of high water and it seems that either Traill was mistaken about the year or was misinformed (PART B)

1867-68**- NORMAL**

- October, 1867, was cold, with snow; the rivers were reported fast on October 31 (Diaries of Dr. William Cowan, PAM MG7 C15 M154) but were opened a week later by mild weather which remained until the end of the month

- from scarce information, December and January seem to have been cold and snowy
January 6, 1868: We are almost buried in snow... (Letter to the Nor' Wester Newspaper from Pembina)

January 19, 1868: All the sleighs are now in from Abercrombie, the unusual depth of snow has however compelled many to leave whole or parts of loads on the way down. (Nor' Wester Newspaper)

- Cowan reported alternating cold and mild weather through February and March, with little mention of snowfall

- by late March, a strong thaw began

March 29, 1868: ...plain road very bare, down by river good. (Cowan Diary, op. cit.)

March 30, 1868: We can safely challenge any country situated north of Lat. 40 to produce a record of finer weather than we have enjoyed since the 15th of February. Hardly a particle of snow has felled since that date and the amount of snow has been sufficient to ensure good sleighing until within the last two weeks- The snow is rapidly disappearing and every indication betokens an early spring with no great amount of high water. (Nor' Wester Newspaper)

- the thaw continued through April, with breakup after the 22nd and a prediction of low water

April 21, 1868: snowing ground white...snow on plains nearly 6 ins. (Cowan Diaries, op. cit.)

April 22, 1868: ...snow all gone-river open main river blocked. (ibid)

April 24, 1868: snowing a little...Bannatyne says river very low above does not believe steamer will run. (ibid)

- the end of April and beginning of May were wet and May appears to have been generally cool

- contrary to Bannatyne's prediction, water levels in late May were good, although falling in mid-June; Traill reported low water in the Assiniboine

May 23, 1868: The Steamer International arrived from Georgetown on Tuesday of last week...[Some persons] arrived on Thursday of last week from Fort Abercrombie with horses. They report the Rivers high, so much so as to necessitate rafts over all the streams except those above Grand Forks... (Nor' Wester Newspaper)

June 13, 1868: The water in the Red River is falling fast and the Steamboat people do not expect to get above Goose Rapids. (ibid)

June 15, 1868: The boats had come down slowly owing to the low water which had prevented all thought of sending up the steamer [up the Assiniboine for a trial run]... (Walter Traill at Portage la Prairie, quoted in Atwood, M., 1970. In Rupert's Land: Memoirs of Walter Traill. McLelland &

Stewart, Toronto, p. 116)

- based on slight information, summer weather appeared normal with periodic rain; water levels in the Red remained adequate for the steamboat to the end of July at least

July 31, 1868: The steamboat arrived this morning about 1 a.m. from up river. (Nor' Wester Newspaper)

- the first half of September was wet

September 15, 1868: We have had intermittent rains, of a few hours durations, for the last ten days. We may look for a day or two longer of lowery weather. (ibid)

1868-69

- NORMAL

- October was cold with considerable precipitation early in the month and freezeup beginning by November 1 but not completed until a week or more later

November 1, 1868: The river froze over this morning. (A Journal of Daily Occurrences at Lower Fort Garry Commenced on the 1st Day of Oct. 1868. HBCA B.303/a/1 1868/74)

November 4, 1868: The man could not cross the river the ice being too weak... (ibid)

November 7, 1868: The weather has been unusually changeable of late, but we confidently look for our Indian summer before winter weather sets in...Ice is floating on the river and there is every appearance of an early winter...The slight fall of snow experienced by us early in October, seems to have been pretty wide spread, we gather from our exchanges that it visited various parts of Canada, Minnesota and northern Missouri. (Nor' Wester Newspaper)

- the first half of November was cold with frequent snow until mid-month when it became much milder and dry until early December

December 5, 1868: We have had most delightful weather since our last issue, affording a pleasant season to those who have gone to freight in the relief supplies. (ibid)

- frequent and occasionally heavy snow was reported from mid-December to the end of the month

December 24, 1868: Dr. Brown reports the late fall of snow to be sufficient for the transportation of any freight requiring to be brought in from Abercrombie. It is badly drifting in some places, but as a general thing, the roads will be good. (ibid)

- little information exists about January weather in the Red River settlement but by the end of January, the Fort Ellice Journal reported that little snow had fallen in that region (Fort Ellice Journal, HBCA B.63/a/10 1868-69)

- by early March, snow cover appears to have been somewhat lighter than usual at the Red River Settlement

March 6, 1869: The depth of snow [normally] varies from one to two feet on the level. It is about one foot this winter, and last winter it was about eighteen inches in depth... (Nor' Wester)

- a strong thaw began in late March with rain; breakup occurred on April 21-22

- high water was reported in the southern Red River basin (PART B) while concerns about

low water were expressed in the Red River Settlement (PART B)

- actual water levels in the spring, however, were good all along the river

May 1, 1869: The flatboats and batteaux have been coming in pretty briskly during the past week from up river. Tow flat boats arrived on Sunday 25th and up to the 26th seven boats arrived...these latter claim to have made the trip in 11 days from Abercrombie and it is said to be the quickest on record. (Nor' Wester Newspaper)

- the weather at the Settlement from May to August seems to have been cool in the first half of the summer, though otherwise unexceptional

- heavy rain must have fallen over the summer upstream of the Settlement because of reported rising water levels in late summer (PART B)

1869-1870

- HIGH

- the river froze on October 24, broke up on November 2, and refroze on November 7 (Fort Garry Journal of Occurrences, HBCA B.303/a/1)

- relatively mild weather occurred throughout November and at least until mid-December, with only a moderate snowfall

November 23, 1869: Although the weather has been cloudy for the past fortnight a very small quantity of snow has fallen. We have now about four inches in depth, and the sleighing will be tolerably good upon the highways. The ice upon the rivers is not yet sufficiently thick and continuous to afford a good road. (Nor' Wester and Pioneer Newspaper)

- no further information is available until April, 1870

- April began very warm, producing an early breakup and strong freshet

April 1, 1870: Weather still warm and pleasant. A great deal of water on the ice. Snow rapidly disappearing. (Alexander Begg in Morton, W.L. (ed.), 1956. Alexander Begg's Red River Journal and Other Papers Relative to the Red River Resistance of 1869-70. The Champlain Society, Toronto, p. 348)

April 3, 1870. Weather still continued fine and the ice on the river is beginning to look dangerous. (ibid, p. 350)

April 5, 1870: The weather was very warm to-day and the river now looks and in fact is quite unsafe. (ibid, p. 351)

April 8, 1870: The weather today was fine with a very warm wind-the river rising rapidly and the ice breaking up. (ibid, p. 353)

April 9, 1870: The river open in front of St. Boniface. (ibid, p.355)

April 10, 1870: The water is high...Several bridges in the settlement have been injured from freshets but there seems to be no danger of a general flood. (ibid, p.355)

April 12, 1870: The river is now quite open and rose considerably to-day. (ibid, p. 356)

April 14, 1870: ...the river rose still more to-day. (ibid, p.357)

April 16, 1870: The weather today unlike yesterday was fine and bright and warm-the late fall of snow rapidly disappeared...River rising a little. (ibid, p. 358)

April 19, 1870: Weather today was beautifully warm and pleasant. The river rose perceptibly today. (ibid, p. 359)

April 21, 1870: ...a warm shower fell in the afternoon and it cleared up altogether afterwards. Mail bags came in empty today with a note from Cavalier at Pembina stating that the roads were very bad between here and Abercrombie and that there was great chances for a freshet. (ibid, p.360)

April 26, 1870: River still rising and the creeks now almost impassable. (ibid, p. 363)

April 27, 1870: River keeping about the same. (ibid, p. 364)

April 28, 1870: ...river seemed to have lowered a little to-day. (ibid, p.364)

April 29, 1870: River falling. (ibid, p. 364)

May 14, 1870: By noon next day we were at Frog Point...The stream was in flood and it was raining. (Walter Traill, in Atwood, M., 1970. In Rupert's Land: Memoirs of Walter Traill, McLelland & Stewart, Toronto, p. 181)

- rain fell on several days between the 14th and the end of May (Diaries of Dr. William Cowan, PAM, MG2 C15 M154)

- no information is available for June but some references in August and September suggest that the summer was wet

August 28, 1870: When night again fell, the whole force had reached a spot six miles from the rebel fort. And what a night of rain and storm then broke upon the Red River Expedition!...the surface of the ground became ankle-deep in mud and water. (Butler, Sir W.F., 1923. The Great Lone Land. A Tale of Travel and Adventure in the North-West of America. Burns Oates & Westbourne Ltd., London, p.188)

August 28, 1870: It has rained upon forty-five days out of ninety-four that have passed by since we landed at Thunder Bay, and upon many occasions every man has been wet through for days altogether. (Letter, Colonel Garnet Wolseley, Fort Garry, to the Regular Troops of the Red River Expeditionary Forces, quoted in Huyshe, Capt. G.L., 1871. The Red River Expedition, London, reprinted in Manitoba Pageant, vol. 5 (3), p. 20)

September 16, 1870. People rave about the climate of Minnesota but so far I have not seen much to enjoy. The mosquitoes began on the 10th of May and have continued ever since. The weather is warm and wet, the most disagreeable summer I have seen since I left home. (Traill, op. cit., p.224)

- an entry by Butler in August *might* be interpreted as indicating that the Red was at or near bankfull but is too ambiguous to be certain

August 18, 1870: Riding quickly down this valley we reached...the edge of some water lying amidst tree-covered banks-the water was the Red River [Butler north of Georgetown]. (Butler, op. cit., p.102)

- given the high water in the spring, possible flooding (see May 14), and the apparently very wet summer, runoff appears to have been high