

Historical Data Utilized in First-hand accounts from 19th century explorers' logs for the Canadian Arctic reflect similar climate conditions as present

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This table lists the 44 expeditions that published scientific observations or other material used in the study, and shows which types of data were available. Monthly and daily mean air temperature data and ice thickness data were used to calculate departure from 20th century reference mean values. Descriptive records (including visual records where available) were used to provide qualitative context and to confirm that results derived from instrumental records were consistent with observed phenomena. Sea surface temperatures were not generally used. The daily temperatures from Back 1836-37 were not used because the record was too fragmented around the seasonal transition periods in spring and fall.

It is difficult to provide a precise estimate of instrumental data quality for each expedition. The performance of thermometers was degraded at temperatures approaching the freezing point of mercury (-38.8 C) and therefore the value of extremely low temperature measurements during winter is questionable. In summer, the presence of melting ice and snow constrain air temperature. In addition, the sheltering of thermometers was not standardized in the modern sense. Instruments were generally sheltered in a specially constructed observatory, but Stevenson screens were not in use during the period. For these reasons it is most likely that monthly temperatures in the spring and autumn are more accurate, as are the estimated annual dates of melt and freeze transition calculated from daily temperatures. Melt and freeze transition dates are produced when the 15 day running mean of the daily average temperature crosses -1 C. The date estimate produced is not especially sensitive to small amounts of bias in the daily data.

The quality of the descriptive records is in some respects easier to assess, but their interpretation in terms of climate change may always be problematic. In this study we have focused on two main issues where the use of descriptive records may be less ambiguous: where and when did expeditions reach certain locations, and were their observations of the environment consistent with the instrumental record.

List of expeditions and data available by type

Period	Leader	Monthly T	Daily Mean T	Sea Surface T	Ice Thickness	Desc. Record
1818	Ross					•
1819-1820	Parry	•	•	•	•	•
1819-1822	Franklin					•
1821-1823	Parry	•	•	•		•
1824	Lyon					•
1824-1825	Parry	•	•	•	•	•

1825-1827	Franklin		•			•
1829-1833	Ross	•	•		•	•
1833-1835	Back					•
1836-1837	Back	•	•			•
1837-1839	Dease & Simpson					•
1845-1848	Franklin					•
1846-1847	Rae	•	•			•
1847-1849	Richardson & Rae					•
1848-1849	Ross, J.C.	•			•	•
1849-1852	Moore	•				•
1849	Penny & Goodsir					•
1849-1850	Saunders	•				•
1850-1851	Austin	•			•	•
1850-1851	DeHaven	•	•	•		•
1850-1851	Penny	•	•		•	•
1850-1853	M'Clure	•			•	•
1850	Snow & Forsyth					•
1851-1852	Kennedy	•				•
1851-1854	Collinson	•			•	•
1852-1854	Belcher	•	•	•		•
1852-1854	Kellet	•	•		•	•
1852-1854	Pullen	•				•
1852-1854	Maguire	•				•
1853-1854	Trollope	•				•
1853-1854	Rae				•	
1853-1855	Kane	•	•			•
1857-1859	M'Clintock	•	•	•	•	•
1860-1861	Hayes	•	•			•
1871-1873	Hall	•	•	•		•
1875-1876	Nares	•	•		•	•
1878-1880	Schwatka					•
1881-1884	Greely	•	•			•
1881-1883	Ray	•	•			•
1884	Schley					•
1898-1902	Sverdrup	•	•			•
1903-1906	Amundsen	•	•			•
1908-1909	Bernier	•				•
1910	Bernier					•